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Natural Resources Conservation Service

Iowa Department of Agriculture and Land Stewardship

IOWA STATE UNIVERSITY
Iowa Agriculture and Home Economics Experiment Station

IOWA STATE UNIVERSITY
University Extension

In cooperation with Iowa Agriculture and Home Economics Experiment Station and Cooperative Extension Service, Iowa State University; and Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship

Soil Survey of Crawford County, Iowa

Part II

How To Use This Soil Survey

This survey is divided into three parts. Part I includes general information about the survey area; descriptions of the general soil map units, detailed soil map units, and soil series in the area; and a description of how the soils formed. Part II describes the use and management of the soils and the major soil properties. This part may be updated as further information about soil management becomes available. Part III includes the maps.

On the **general soil map**, the survey area is divided into groups of soils called associations. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the soil associations on the color-coded map legend, and then refer to the section **General Soil Map Units** in Part I for a general description of the soils in your area.

The detailed soil maps can be useful in planning the use and management of small areas.

To find information about your area of interest, locate that area on the **Index to Map Sheets** in Part III. Note the number of the map sheet, and turn to that sheet. Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. The **Contents** in Part I lists the map units and shows the page where each map unit is described.

The **Contents** in Part II shows which table has information on a specific land use or soil property for each detailed soil map unit. Also, see the **Contents** in Part I and Part II for other sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (formerly the Soil Conservation Service) has leadership for the Federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 2002. Soil names and descriptions were approved in 2004. This survey was made cooperatively by the Natural Resources Conservation Service; the Iowa Agriculture and Home Economics Experiment Station and Cooperative Extension Service, Iowa State University; and the Division of Soil Conservation, Iowa Department of Agriculture and Land Stewardship. The survey is part of the technical assistance furnished to the Crawford County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Contour farming and terraces in an area of Marshall soils. Corn and soybeans are planted in this area in alternate seasons.

Additional information about the Nation's natural resources is available online from the Natural Resources Conservation Service at http://www.nrcs.usda.gov.

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Soil Survey of
Crawford County, Iowa

Introduction to Part II

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help to prevent soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

This part of the soil survey includes interpretations for various uses of the soils and data on soil properties. This information can be used to plan the use and management of soils for crops and pasture or as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreational facilities. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Soils are rated in their natural state. No unusual modification of the soil site or material is made other than that which is considered normal practice for the rated use. Even though soils may have limitations, it is important to remember that engineers and others can modify soil features or can design or adjust the plans for a structure to compensate for most of the limitations. Most of these practices, however, are costly. The final decision in selecting a site for a particular use generally involves weighing the costs of site preparation and maintenance.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of gravel, sand, reclamation material, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

The table “Classification of the Soils” is at the end of this section. Information about the system of soil taxonomy used by the Natural Resources Conservation Service is available in Part I of this publication. The extent of the map units in this survey area is shown in the table “Acreage and Proportionate Extent of the Soils.”

Interpretive Ratings

The interpretive tables in this survey rate the soils in the survey area for various uses. Many of the tables identify the limitations that affect specified uses and indicate the severity of those limitations. The ratings in these tables are both verbal and numerical.

Rating Class Terms

Rating classes are expressed in the tables in terms that indicate the extent to which the soils are limited by all of the soil features that affect a specified use or in terms that indicate the suitability of the soils for the use. Thus, the tables may show limitation classes or suitability classes. Terms for the limitation classes are *not limited, somewhat limited,* and *very limited*. The suitability ratings are expressed as *well suited, moderately suited, poorly suited,* and *unsuited* or as *good, fair,* and *poor*.

Numerical Ratings

Numerical ratings in the tables indicate the relative severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.00 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use and the point at which the soil feature is not a limitation. The limitations appear in order from the most limiting to the least limiting. Thus, if more than one limitation is identified, the most severe limitation is listed first and the least severe one is listed last.

Classification of the Soils

(An asterisk in the first column indicates a taxadjunct to the series. See text in Part I for a description of those characteristics that are outside the range of the series)

Soil name	Family or higher taxonomic class
Ackmore	Fine-silty, mixed, superactive, nonacid, mesic Mollic Fluvaquents
Burchard	Fine-loamy, mixed, superactive, mesic Typic Argiudolls
Chute	Mixed, mesic Typic Udipsamments
Colo	Fine-silty, mixed, superactive, mesic Cumulic Endoaquolls
Danbury	Fine-silty, mixed, superactive, nonacid, mesic Oxyaquic Udifluvents
Dow	Fine-silty, mixed, superactive, calcareous, mesic Typic Udorthents
*Exira	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Hawick	Sandy, mixed, mesic Entic Hapludolls
Ida	Fine-silty, mixed, superactive, calcareous, mesic Typic Udorthents
Judson	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Kennebec	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Knox	Fine-silty, mixed, superactive, mesic Mollic Hapludalfs
Liston	Fine-loamy, mixed, superactive, mesic Typic Eutrudepts
Marshall	Fine-silty, mixed, superactive, mesic Typic Hapludolls
*Marshall	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Monona	Fine-silty, mixed, superactive, mesic Typic Hapludolls
*Monona	Fine-silty, mixed, superactive, mesic Dystric Eutrudepts
Napier	Fine-silty, mixed, superactive, mesic Cumulic Hapludolls
Nodaway	Fine-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Rawles	Fine-silty, mixed, superactive, calcareous, mesic Oxyaquic Udifluvents
Smithland	Fine-silty, mixed, superactive, mesic Aquic Cumulic Hapludolls
Zook	Fine, smectitic, mesic Cumulic Vertic Endoaquolls

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
1C	Ida silt loam, 5 to 9 percent slopes	664	0.1
1C3	Ida silt loam, 5 to 9 percent slopes, severely eroded	10,458	2.3
1D3	Ida silt loam, 9 to 14 percent slopes, severely eroded	7,800	1.7
1E3	Ida silt loam, 14 to 20 percent slopes, severely eroded	7,714	1.7
1F3	Ida silt loam, 20 to 30 percent slopes, severely eroded	1,051	0.2
8B	Judson silty clay loam, 2 to 5 percent slopes	20,632	4.5
8C	Judson silty clay loam, 5 to 9 percent slopes	7,399	1.6
9	Marshall silty clay loam, 0 to 2 percent slopes	92	*
9B	Marshall silty clay loam, 2 to 5 percent slopes	10,969	2.4
9B2	Marshall silty clay loam, 2 to 5 percent slopes, moderately eroded	4,618	1.0
9C	Marshall silty clay loam, 5 to 9 percent slopes	4,449	1.0
9C2	Marshall silty clay loam, 5 to 9 percent slopes, moderately eroded	29,590	6.5
9D	Marshall silty clay loam, 9 to 14 percent slopes	331	*
9D2	Marshall silty clay loam, 9 to 14 percent slopes, moderately eroded	40,384	8.8
9E2	Marshall silty clay loam, 14 to 18 percent slopes, moderately eroded	6,917	1.5
9E3	Marshall silty clay loam, 14 to 18 percent slopes, severely eroded	5,687	1.2
10B	Monona silt loam, 2 to 5 percent slopes	1,049	0.2
10B2	Monona silt loam, 2 to 5 percent slopes, moderately eroded	781	0.2
10C2	Monona silt loam, 5 to 9 percent slopes, moderately eroded	10,153	2.2
10D2	Monona silt loam, 9 to 14 percent slopes, moderately eroded	11,408	2.5
10D3	Monona silt loam, 9 to 14 percent slopes, severely eroded	2,776	0.6
10E2	Monona silt loam, 14 to 20 percent slopes, moderately eroded	6,320	1.4
10E3	Monona silt loam, 14 to 20 percent slopes, severely eroded	4,813	1.1
10F2	Monona silt loam, 20 to 30 percent slopes, moderately eroded	1,502	0.3
10F3	Monona silt loam, 20 to 30 percent slopes, severely eroded	1,387	0.3
12B	Napier silt loam, 2 to 5 percent slopes	7,557	1.7
12C	Napier silt loam, 5 to 9 percent slopes	7,297	1.6
17B	Napier-Kennebec-Nodaway complex, 2 to 5 percent slopes	7,743	1.7
22D2	Dow silt loam, 9 to 14 percent slopes, moderately eroded	265	*
22D3	Dow silt loam, 9 to 14 percent slopes, severely eroded	798	0.2
22E3	Dow silt loam, 14 to 20 percent slopes, severely eroded	974	0.2
26	Kennebec silty clay loam, 0 to 2 percent slopes, occasionally flooded	2,393	0.5
35D2	Liston-Burchard complex, 9 to 14 percent slopes, moderately eroded	407	*
35E2	Liston-Burchard complex, 14 to 18 percent slopes, moderately eroded	5,269	1.2
35F2	Liston-Burchard complex, 18 to 25 percent slopes, moderately eroded	2,695	0.6
35G	Liston-Burchard complex, 25 to 40 percent slopes	371	*
54	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	859	0.2
54+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	622	0.1
59D2	Burchard clay loam, 9 to 14 percent slopes, moderately eroded	1,941	0.4
59E2	Burchard clay loam, 14 to 18 percent slopes, moderately eroded	1,283	0.3
99C2	Exira silty clay loam, 5 to 9 percent slopes, moderately eroded	2,818	0.6
99D2	Exira silty clay loam, 9 to 14 percent slopes, moderately eroded	12,019	2.6
99E2	Exira silty clay loam, 14 to 18 percent slopes, moderately eroded	1,516	0.3
100B	Monona silty clay loam, 2 to 5 percent slopes	4,444	1.0
100C2	Monona silty clay loam, 5 to 9 percent slopes, moderately eroded	24,311	5.3
100D2	Monona silty clay loam, 9 to 14 percent slopes, moderately eroded	34,477	7.5
100D3	Monona silty clay loam, 9 to 14 percent slopes, severely eroded	8,502	1.9
100E2	Monona silty clay loam, 14 to 20 percent slopes, moderately eroded	13,727	3.0
100E3	Monona silty clay loam, 14 to 20 percent slopes, severely eroded	8,306	1.8
100F2	Monona silty clay loam, 20 to 30 percent slopes, moderately eroded	1,802	0.4
100F3	Monona silty clay loam, 20 to 30 percent slopes, severely eroded	1,499	0.3
111D3	Dow-Monona complex, 9 to 14 percent slopes, severely eroded	1,024	0.2
111E3	Dow-Monona complex, 14 to 20 percent slopes, severely eroded	1,678	0.4
125D3	Ida-Chute complex, 9 to 14 percent slopes, severely eroded	324	*
125E3	Ida-Chute complex, 14 to 20 percent slopes, severely eroded	301	*
133	Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded	993	0.2
133+	Colo silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	2,361	0.5
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	4,955	1.1
212+	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	2,933	0.6
220	Nodaway silt loam, 0 to 2 percent slopes, occasionally flooded	7,487	1.6
266	Smithland silty clay loam, 0 to 2 percent slopes, occasionally flooded	1,129	0.2

See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
266+	Smithland silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	799	0.2
268D	Knox silt loam, 9 to 14 percent slopes	257	*
268E	Knox silt loam, 14 to 20 percent slopes	726	0.2
268F	Knox silt loam, 20 to 30 percent slopes	1,031	0.2
430	Ackmore silt loam, 0 to 2 percent slopes, occasionally flooded	1,603	0.4
431B	Judson-Ackmore-Colo, overwash, complex, 2 to 5 percent slopes	52,271	11.4
509B	Marshall silty clay loam, terrace, 2 to 5 percent slopes	893	0.2
509C	Marshall silty clay loam, terrace, 5 to 9 percent slopes	137	*
509C2	Marshall silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	483	0.1
509D2	Marshall silty clay loam, terrace, 9 to 14 percent slopes, moderately eroded	302	*
509E2	Marshall silty clay loam, terrace, 14 to 20 percent slopes, moderately eroded	70	*
510	Monona silt loam, terrace, 0 to 2 percent slopes	1,487	0.3
510B	Monona silt loam, terrace, 2 to 5 percent slopes	1,264	0.3
510C2	Monona silt loam, terrace, 5 to 9 percent slopes, moderately eroded	688	0.2
510D2	Monona silt loam, terrace, 9 to 14 percent slopes, moderately eroded	333	*
510E2	Monona silt loam, terrace, 14 to 20 percent slopes, moderately eroded	216	*
630	Danbury silt loam, 0 to 2 percent slopes, occasionally flooded	6,914	1.5
670	Rawles silt loam, 0 to 2 percent slopes, occasionally flooded	633	0.1
700	Monona silty clay loam, terrace, 0 to 2 percent slopes	195	*
700B	Monona silty clay loam, terrace, 2 to 5 percent slopes	1,531	0.3
700C2	Monona silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	761	0.2
700D2	Monona silty clay loam, terrace, 9 to 14 percent slopes, moderately eroded	382	*
717D	Napier-Gullied land complex, 5 to 14 percent slopes	944	0.2
740D	Hawick gravelly sandy loam, 9 to 14 percent slopes	250	*
740E	Hawick gravelly sandy loam, 14 to 18 percent slopes	202	*
740F	Hawick gravelly sandy loam, 18 to 25 percent slopes	225	*
980C	Judson-Gullied land complex, 5 to 9 percent slopes	1,371	0.3
1220	Nodaway silt loam, channeled, 0 to 2 percent slopes, frequently flooded	2,290	0.5
5010	Pits, sand and gravel	125	*
5040	Udorthents, loamy	739	0.2
5080	Udorthents, sanitary landfill	113	*
AW	Animal waste lagoon	14	*
SL	Sewage lagoon	156	*
W	Water	1,771	0.4
	Total	457,200	100.0

* Less than 0.1 percent.

Agronomy

This section provides some general information about managing the soils for crops and for hay and pasture. The Iowa corn suitability rating system and the system of land capability classification used by the Natural Resources Conservation Service are explained, and the estimated yields of the main crops and hay and pasture plants are listed for each soil. Prime farmland and other important farmlands are described, and interpretations for agricultural waste management are provided.

Planners of management systems for individual fields or farms should consider obtaining specific information from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Cropland Management Considerations

The management concerns affecting the use of the detailed soil map units in the county for crops are shown in the table “Cropland Management Considerations” at the end of this section. The main concerns in managing nonirrigated cropland are conserving moisture, controlling wind erosion and water erosion, and maintaining soil fertility.

Conserving moisture consists primarily of reducing the evaporation and runoff rates and increasing the water infiltration rate. Applying conservation tillage and conservation cropping systems, farming on the contour, stripcropping, establishing field windbreaks, and leaving crop residue on the surface conserve moisture.

Generally, a combination of several practices is needed to control wind erosion and water erosion. Conservation tillage, stripcropping, field windbreaks, contour farming, conservation cropping systems, crop residue management, terraces, diversions, and grassed waterways help to prevent excessive soil loss.

Measures that are effective in maintaining soil fertility include applying fertilizer, both organic and inorganic, including manure; incorporating crop residue or green manure crops into the soil; and using proper crop rotations. Controlling erosion helps to prevent the loss of organic matter and plant nutrients and thus helps to maintain productivity, although the level of fertility can be reduced even in areas where erosion is controlled. All soils used for nonirrigated crops respond well to applications of fertilizer.

Some of the considerations shown in the table cannot be easily overcome. These are channels, flooding, gullies, and ponding.

Additional considerations are as follows:

Lime content, limited available water capacity, limited content of organic matter, potential poor tilth and compaction, and restricted permeability.—These limitations can be minimized by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

Potential for ground-water contamination.—The proper use of nutrients and pesticides can reduce the risk of ground-water contamination.

Potential for surface-water contamination.—The risk of surface-water contamination can be reduced by the proper use of nutrients and pesticides and by conservation farming practices that reduce the runoff rate.

Surface crusting.—This limitation retards seedling development after periods of heavy rainfall.

Surface rock fragments.—This limitation causes rapid wear of tillage equipment. It cannot be easily overcome.

Surface stones.—Stones or boulders on or near the surface can hinder normal tillage unless they are removed.

Salt content.—In areas where this is a limitation, only salt-tolerant crops should be grown.

On irrigated soils the main management concerns are efficient water use, nutrient management, control of erosion, pest and weed control, and timely planting and harvesting for a successful crop. An irrigation system that provides optimum control and distribution of water at minimum cost is needed. Overirrigation wastes water, leaches plant nutrients, and causes erosion. Also, it can increase wetness and soil salinity.

Explanation of Criteria

Acid soil.—The pH is less than 6.1.

Channeled.—The word “channeled” is included in the map unit name.

Dense layer.—The bulk density is 1.80 g/cc or greater within the soil profile.

Depth to rock.—The depth to bedrock is less than 40 inches.

Eroded.—The word "eroded" is included in the map unit name.

Excessive permeability.—Saturated hydraulic conductivity is 42 micrometers per second or more within the soil profile.

Flooding.—Flooding is occasional, frequent, or very frequent.

Gullied.—The word "gullied" is included in the map unit name.

High content of organic matter.—The surface layer has more than 20 percent organic matter.

Lime content.—The pH is 7.4 or more in the surface layer, or the wind erodibility group is 4L.

Limited available water capacity.—The available water capacity calculated to a depth of 60 inches or to a root-limiting layer is 6 inches or less.

Limited content of organic matter.—The content of organic matter is 2 percent or less in the surface layer.

Ponding.—Ponding duration is assigned to the map unit component. Water is above the surface.

Potential poor tilth and compaction.—The content of clay is 27 percent or more in the surface layer.

Potential for ground-water contamination (by nutrients or pesticides).—The depth to a seasonal high water table is 4 feet or less, the saturated hydraulic conductivity of any layer is more than 42 micrometers per second, or the depth to bedrock is less than 60 inches.

Potential for surface-water contamination (by nutrients or pesticides).—The map unit component is occasionally, frequently, or very frequently flooded, is subject to ponding, is assigned to hydrologic group C or D and has a slope of more than 2 percent, is assigned to hydrologic group A and has a slope of more than 6 percent, or is assigned to hydrologic group B, has a slope of 3 percent or more, and has a K factor of more than 0.17.

Previously eroded.—The word "eroded" is included in the map unit name.

Restricted permeability.—Saturated hydraulic conductivity is less than 0.42 micrometer per second within the soil profile.

Salt content.—The electrical conductivity is 4 or more in the surface layer or 8 or more within a depth of 30 inches.

Slope (equipment limitation).—The slope is more than 15 percent.

Surface crusting.—The content of clay is 27 percent or more and the content of organic matter is 2 percent or less in the surface layer.

Surface rock fragments (equipment limitation).—The terms describing the texture of the surface layer include any rock fragment modifier, except for gravelly, channery, stony, very stony, extremely stony, bouldery, very bouldery, and extremely bouldery.

Surface stones (equipment limitation).—The word "stony" or "bouldery" is included in the description of the surface layer, or 0.01 to 0.1 percent of the surface is covered by stones or boulders.

Water erosion.—Either the slope is 6 percent or more, or the slope is more than 3 percent and less than 6 percent and the surface layer is not sandy.

Water table.—A water table is within 2.5 feet of the surface.

Wind erosion.—The wind erodibility group is 1, 2, 3, or 4L.

Hydrologic groups are described under the heading "Water Features." Erosion factors (e.g., K factor) and wind erodibility groups are described under the heading "Physical Properties."

Cropland Management Considerations

(See text for a description of the considerations listed in this table)

Map symbol and soil name	Pct. of map unit	Cropland management considerations
1C:		
Ida	95	Lime content Potential for surface-water contamination Water erosion Wind erosion
1C3:		
Ida, severely eroded	80	Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
1D3:		
Ida, severely eroded	80	Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
1E3:		
Ida, severely eroded	70	Slope Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
1F3:		
Ida, severely eroded	70	Slope Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
8B:		
Judson	80	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
8C:		
Judson	95	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
9:		
Marshall	95	Potential poor tilth and compaction
9B:		
Marshall	100	Potential poor tilth and compaction Potential for surface-water contamination Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
9B2:		
Marshall, moderately eroded--	85	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
9C:		
Marshall----------	90	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
9C2:		
Marshall, moderately eroded--	80	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
9D:		
Marshall----------	85	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
9D2:		
Marshall, moderately eroded--	70	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
9E2:		
Marshall, moderately eroded--	70	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
9E3:		
Marshall, severely eroded----	75	Slope Limited content of organic matter Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Surface crusting Water erosion
10B:		
Monona----------	100	Potential for surface-water contamination Water erosion
10B2:		
Monona, moderately eroded----	80	Potential for surface-water contamination Previously eroded Water erosion
10C2:		
Monona, moderately eroded----	75	Potential for surface-water contamination Previously eroded Water erosion
10D2:		
Monona, moderately eroded----	60	Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
10D3:		
Monona, severely eroded------	95	Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
10E2:		
Monona, moderately eroded----	50	Slope Potential for surface-water contamination Previously eroded Water erosion
10E3:		
Monona, severely eroded------	60	Slope Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
10F2:		
Monona, moderately eroded----	45	Slope Potential for surface-water contamination Previously eroded Water erosion
10F3:		
Monona, severely eroded------	70	Slope Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
12B:		
Napier-----------------------	85	Potential for surface-water contamination Water erosion
12C:		
Napier-----------------------	95	Potential for surface-water contamination Water erosion
17B:		
Napier-----------------------	50	Potential for surface-water contamination Water erosion
Kennebec, frequently flooded	20	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion
Nodaway, frequently flooded--	15	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion
22D2:		
Dow, moderately eroded-------	90	Lime content Potential for surface-water contamination Previously eroded Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
22D3:		
Dow, severely eroded	90	Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
22E3:		
Dow, severely eroded	80	Slope Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
26:		
Kennebec, occasionally flooded	95	Flooding Excessive permeability Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination
35D2:		
Liston, moderately eroded	50	Lime content Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Burchard, moderately eroded	35	Potential for surface-water contamination Previously eroded Water erosion
35E2:		
Liston, moderately eroded	50	Slope Lime content Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Burchard, moderately eroded	35	Slope Potential for surface-water contamination Previously eroded Water erosion
35F2:		
Liston, moderately eroded	40	Slope Lime content Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Burchard, moderately eroded	30	Slope Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
35G:		
Liston	45	Slope Lime content Potential for surface-water contamination Water erosion Wind erosion
Burchard	35	Slope Potential for surface-water contamination Water erosion
54:		
Zook, occasionally flooded	90	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water table
54+:		
Zook, overwash, occasionally flooded	90	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
59D2:		
Burchard, moderately eroded	55	Potential for surface-water contamination Previously eroded Water erosion
59E2:		
Burchard, moderately eroded	55	Slope Potential for surface-water contamination Previously eroded Water erosion
99C2:		
Exira, moderately eroded	80	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
99D2:		
Exira, moderately eroded	50	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
99E2:		
Exira, moderately eroded	45	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100B:		
Monona	75	Potential poor tilth and compaction Potential for surface-water contamination Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
100C2:		
Monona, moderately eroded----	50	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100D2:		
Monona, moderately eroded----	45	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100D3:		
Monona, severely eroded------	45	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100E2:		
Monona, moderately eroded----	45	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100E3:		
Monona, severely eroded------	45	Slope Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
100F2:		
Monona, moderately eroded----	55	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
100F3:		
Monona, severely eroded------	70	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
111D3:		
Dow, severely eroded---------	55	Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Monona, severely eroded------	40	Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
111E3:		
Dow, severely eroded---------	55	Slope Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Monona, severely eroded------	40	Slope Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
125D3:		
Ida, severely eroded---------	50	Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Chute, severely eroded-------	30	Excessive permeability Lime content Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
125E3:		
Ida, severely eroded---------	50	Slope Lime content Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion Wind erosion
Chute, severely eroded-------	30	Slope Excessive permeability Lime content Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
133:		
Colo, occasionally flooded---	85	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
133+:		
Colo, overwash, occasionally flooded	85	Flooding Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water table
212:		
Kennebec, occasionally flooded	70	Flooding Potential for ground-water contamination Potential for surface-water contamination
212+:		
Kennebec, overwash, occasionally flooded	90	Flooding Potential for ground-water contamination Potential for surface-water contamination
220:		
Nodaway, occasionally flooded	75	Flooding Potential for ground-water contamination Potential for surface-water contamination
266:		
Smithland, occasionally flooded	85	Flooding Potential poor tilth and compaction Potential for ground-water contamination Potential for surface-water contamination Water table
266+:		
Smithland, overwash, occasionally flooded	75	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
268D:		
Knox	85	Potential for surface-water contamination Water erosion
268E:		
Knox	80	Slope Potential for surface-water contamination Water erosion
268F:		
Knox	75	Slope Potential for surface-water contamination Water erosion
430:		
Ackmore, occasionally flooded	75	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
431B:		
Judson	55	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
Ackmore, frequently flooded	25	Flooding Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
Colo, overwash, frequently flooded	15	Flooding Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table
509B:		
Marshall, terrace	90	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
509C:		
Marshall, terrace	85	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
509C2:		
Marshall, terrace, moderately eroded	65	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
509D2:		
Marshall, terrace, moderately eroded	65	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
509E2:		
Marshall, terrace, moderately eroded	65	Slope Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
510:		
Monona, terrace	100	No major considerations
510B:		
Monona, terrace	60	Potential for surface-water contamination Water erosion
510C2:		
Monona, terrace, moderately eroded	75	Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
510D2:		
Monona, terrace, moderately eroded	75	Potential for surface-water contamination Previously eroded Water erosion
510E2:		
Monona, terrace, moderately eroded	75	Slope Potential for surface-water contamination Previously eroded Water erosion
630:		
Danbury, occasionally flooded	80	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
670:		
Rawles, occasionally flooded	80	Flooding Lime content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
700:		
Monona, terrace	100	Potential poor tilth and compaction
700B:		
Monona, terrace	75	Potential poor tilth and compaction Potential for surface-water contamination Water erosion
700C2:		
Monona, terrace, moderately eroded	50	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
700D2:		
Monona, terrace, moderately eroded	60	Potential poor tilth and compaction Potential for surface-water contamination Previously eroded Water erosion
717D:		
Napier	50	Gullied Potential for surface-water contamination Water erosion
Gullied land, frequently flooded	35	Not applicable
740D:		
Hawick	90	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Pct. of map unit	Cropland management considerations
740E:		
Hawick	90	Slope Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
740F:		
Hawick	90	Slope Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
980C:		
Judson	55	Gullied Potential poor tilth and compaction Potential for surface-water contamination Water erosion
Gullied land, frequently flooded	35	Not applicable
1220:		
Nodaway, channeled, frequently flooded	80	Flooding Channeled Potential for ground-water contamination Potential for surface-water contamination
5010:		
Pits, sand and gravel	100	Not applicable
5040:		
Udorthents	100	Onsite investigation required
5080:		
Udorthents	100	Not applicable
AW:		
Animal waste lagoon	100	Not applicable
SL:		
Sewage lagoon	100	Not applicable
W:		
Water	100	Not applicable

Crop Yield Estimates

The tables “Land Capability, Corn Suitability Rating, and Yields per Acre of Crops” and “Land Capability and Yields per Acre of Pasture” are described in this section. Crops other than those shown in the tables are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for forestland or for engineering purposes.

In the capability system, soils are generally grouped at three levels—capability class, subclass, and unit.

Capability classes, the broadest groups, are designated by the numbers 1 through 8. The numbers indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class 1 soils have slight limitations that restrict their use.

Class 2 soils have moderate limitations that restrict the choice of plants or that require moderate conservation practices.

Class 3 soils have severe limitations that restrict the choice of plants or that require special conservation practices, or both.

Class 4 soils have very severe limitations that restrict the choice of plants or that require very careful management, or both.

Class 5 soils are subject to little or no erosion but have other limitations, impractical to remove, that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 6 soils have severe limitations that make them generally unsuitable for cultivation and that restrict their use mainly to pasture, rangeland, forestland, or wildlife habitat.

Class 7 soils have very severe limitations that make them unsuitable for cultivation and that restrict their use mainly to grazing, forestland, or wildlife habitat.

Class 8 soils and miscellaneous areas have limitations that preclude commercial plant production and that restrict their use to recreational purposes, wildlife habitat, watershed, or esthetic purposes.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, 2e. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class 1 there are no subclasses because the soils of this class have few limitations. Class 5 contains only the subclasses indicated by *w, s,* or *c* because the

soils in class 5 are subject to little or no erosion. They have other limitations that restrict their use to pasture, rangeland, forestland, or wildlife habitat.

Capability units are soil groups within a subclass. The soils in a capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, 2e-4 and 3e-6. These units are not given in all soil surveys.

[Reference: United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. USDA Handbook 210.]

Corn Suitability Rating

The corn suitability rating (CSR) system was developed in Iowa to rate the productivity of each different kind of soil for row crops. CSRs provide a relative ranking of all soils mapped in the State of Iowa. They can be used to compare the potential yield production of one soil with that of other soils. Ratings range from 5 to 100. A rating of 5 indicates severe limitations for row crop production. Soil properties and weather conditions are the dominant factors that affect productivity.

Crop Yields

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the table. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations also are considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Pasture Yields

Some pasture yields are expressed in the table in terms of animal unit months. An animal unit month (AUM) is the amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

The local office of the Natural Resources Conservation Service or the Cooperative Extension Service can provide information about forage yields other than those shown in the table.

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops

(The following crop yield estimates are based on a high level of management and are determined through recent research conducted by Iowa State University. They are for nonirrigated areas. See text for additional information. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
1C---------- Ida	95	3e	60	143	55	90
1C3---------- Ida, severely eroded	80	3e	55	140	34	56
1D3---------- Ida, severely eroded	80	3e	45	131	51	83
1E3---------- Ida, severely eroded	70	4e	35	113	47	76
1F3---------- Ida, severely eroded	70	6e	15	---	---	---
8B---------- Judson	80	2e	81	185	66	108
8C---------- Judson	95	3e	66	170	64	104
9---------- Marshall	95	1	86	189	68	111
9B---------- Marshall	100	2e	81	180	67	109
9B2---------- Marshall, moderately eroded	85	2e	79	174	65	106
9C---------- Marshall	90	3e	66	168	65	105
9C2---------- Marshall, moderately eroded	80	3e	64	164	62	102
9D---------- Marshall	85	3e	56	156	60	99
9D2---------- Marshall, moderately eroded	70	3e	54	153	58	96
9E2---------- Marshall, moderately eroded	70	4e	44	133	52	85
9E3---------- Marshall, severely eroded	75	4e	41	128	49	81
10B---------- Monona	100	2e	80	169	63	103

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
10B2---------- Monona, moderately eroded	80	2e	78	162	61	100
10C2---------- Monona, moderately eroded	75	3e	63	164	59	96
10D2---------- Monona, moderately eroded	60	3e	53	141	55	89
10D3---------- Monona, severely eroded	95	3e	50	141	52	86
10E2---------- Monona, moderately eroded	50	4e	43	127	50	82
10E3---------- Monona, severely eroded	60	4e	40	125	46	75
10F2---------- Monona, moderately eroded	45	6e	23	---	---	---
10F3---------- Monona, severely eroded	70	6e	20	---	---	---
12B---------- Napier	85	2e	80	161	63	103
12C---------- Napier	95	3e	65	146	61	99
17B----------			57	148	51	84
Napier----------	50	2e				
Kennebec, frequently flooded----------	20	2w				
Nodaway, frequently flooded----------	15	2w				
22D2---------- Dow, moderately eroded	90	3e	46	120	43	71
22D3---------- Dow, severely eroded	90	3e	43	113	41	67
22E3---------- Dow, severely eroded	80	4e	43	97	34	56
26---------- Kennebec, occasionally flooded	95	2w	85	129	65	105
35D2----------			40	123	42	69
Liston, moderately eroded----------	50	3e				
Burchard, moderately eroded----------	35	3e				

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
35E2			30	71	36	58
Liston, moderately eroded	50	4e				
Burchard, moderately eroded	35	4e				
35F2			8	---	---	---
Liston, moderately eroded	40	6e				
Burchard, moderately eroded	30	6e				
35G			5	---	---	---
Liston	45	7e				
Burchard	35	7e				
54	90	2w	73	118	55	89
Zook, occasionally flooded						
54+	90	2w	78	125	58	94
Zook, overwash, occasionally flooded						
59D2	55	3e	58	89	46	75
Burchard, moderately eroded						
59E2	55	4e	33	75	39	64
Burchard, moderately eroded						
99C2	80	3e	61	167	57	93
Exira, moderately eroded						
99D2	50	3e	51	149	53	86
Exira, moderately eroded						
99E2	45	4e	41	135	46	75
Exira, moderately eroded						
100B	75	2e	80	158	63	103
Monona						
100C2	50	3e	63	153	59	96
Monona, moderately eroded						
100D2	45	3e	53	140	55	89
Monona, moderately eroded						
100D3	45	3e	50	145	52	86
Monona, severely eroded						
100E2	45	4e	43	126	48	79
Monona, moderately eroded						
100E3	45	4e	40	127	46	75
Monona, severely eroded						

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
100F2---------- Monona, moderately eroded	55	6e	23	---	---	---
100F3---------- Monona, severely eroded	70	7e	20	---	---	---
111D3----------			45	129	46	75
Dow, severely eroded----	55	3e				
Monona, severely eroded	40	3e				
111E3----------			36	103	39	64
Dow, severely eroded----	55	4e				
Monona, severely eroded	40	4e				
125D3----------			23	90	29	48
Ida, severely eroded----	50	3e				
Chute, severely eroded--	30	7s				
125E3----------			13	80	26	42
Ida, severely eroded----	50	4e				
Chute, severely eroded--	30	7s				
133---------- Colo, occasionally flooded	85	2w	80	170	65	105
133+---------- Colo, overwash, occasionally flooded	85	2w	85	174	66	108
212---------- Kennebec, occasionally flooded	70	2w	85	192	65	105
212+---------- Kennebec, overwash, occasionally flooded	90	2w	90	177	65	105
220---------- Nodaway, occasionally flooded	75	2w	86	177	65	105
266---------- Smithland, occasionally flooded	85	2w	85	162	65	105
266+---------- Smithland, overwash, occasionally flooded	75	2w	90	170	65	105
268D---------- Knox	85	3e	50	129	53	86
268E---------- Knox	80	4e	40	116	46	75
268F---------- Knox	75	6e	20	---	---	---

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
430---------- Ackmore, occasionally flooded	75	2w	86	168	68	111
431B----------			66	180	55	89
Judson----------	55	2e				
Ackmore, frequently flooded----------	25	2w				
Colo, overwash, frequently flooded-----	15	2w				
509B---------- Marshall, terrace	90	2e	76	185	67	109
509C---------- Marshall, terrace	85	3e	68	180	65	105
509C2---------- Marshall, terrace, moderately eroded	65	3e	64	176	62	102
509D2---------- Marshall, terrace, moderately eroded	65	3e	54	167	54	96
509E2---------- Marshall, terrace, moderately eroded	65	4e	44	156	52	85
510---------- Monona, terrace	100	1	85	179	65	105
510B---------- Monona, terrace	60	2e	80	171	63	103
510C2---------- Monona, terrace, moderately eroded	75	3e	63	165	59	96
510D2---------- Monona, terrace, moderately eroded	75	3e	53	149	55	89
510E2---------- Monona, terrace, moderately eroded	75	4e	43	133	48	79
630---------- Danbury, occasionally flooded	80	2w	85	178	65	105
670---------- Rawles, occasionally flooded	80	2w	80	144	59	96
700---------- Monona, terrace	100	1	85	166	65	105
700B---------- Monona, terrace	75	2e	80	166	63	103

Land Capability, Corn Suitability Rating, and Yields per Acre of Crops--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Corn suitability rating	Corn	Soybeans	Oats
				Bu	Bu	Bu
700C2--- Monona, terrace, moderately eroded	50	3e	63	166	59	96
700D2--- Monona, terrace, moderately eroded	60	3e	53	152	55	89
717D---			5	---	---	---
Napier---	50	3e				
Gullied land, frequently flooded---	35	7e				
740D--- Hawick	90	4s	12	65	30	49
740E--- Hawick	90	6s	5	---	---	---
740F--- Hawick	90	7s	5	---	---	---
980C---			5	---	---	---
Judson---	55	3e				
Gullied land, frequently flooded---	35	7e				
1220--- Nodaway, channeled, frequently flooded	80	5w	25	---	---	---
5010. Pits, sand and gravel						
5040. Udorthents						
5080. Udorthents						
AW. Animal waste lagoon						
SL. Sewage lagoon						
W. Water						

Land Capability and Yields per Acre of Pasture

(Yields are those that can be expected under a high level of management. They are for nonirrigated areas. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil)

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
1C Ida	95	3e	5.2	5.1	3.1	5.3
1C3 Ida, severely eroded	80	3e	4.7	4.6	2.7	4.8
1D3 Ida, severely eroded	80	3e	4.8	4.6	2.8	4.9
1E3 Ida, severely eroded	70	4e	4.4	4.2	2.6	4.5
1F3 Ida, severely eroded	70	6e	3.1	3.2	1.2	3.1
8B Judson	80	2e	6.2	6.2	3.7	6.3
8C Judson	95	3e	6.0	5.6	3.5	6.1
9 Marshall	95	1	6.4	5.1	3.8	6.5
9B Marshall	100	2e	6.3	5.1	3.7	6.4
9B2 Marshall, moderately eroded	85	2e	6.1	5.1	3.6	6.2
9C Marshall	90	3e	6.1	6.0	3.5	6.2
9C2 Marshall, moderately eroded	80	3e	5.9	5.1	3.5	6.0
9D Marshall	85	3e	5.7	5.1	3.4	5.8
9D2 Marshall, moderately eroded	70	3e	5.5	5.1	3.3	5.6
9E2 Marshall, moderately eroded	70	4e	4.9	5.1	2.9	5.0
9E3 Marshall, severely eroded	75	4e	4.7	5.1	2.8	4.7
10B Monona	100	2e	6.0	5.8	3.5	6.0

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
10B2--- Monona, moderately eroded	80	2e	5.8	5.6	3.4	5.9
10C2--- Monona, moderately eroded	75	3e	5.6	5.5	3.3	5.6
10D2--- Monona, moderately eroded	60	3e	5.2	5.1	3.1	5.2
10D3--- Monona, severely eroded	95	3e	5.0	4.7	2.9	5.0
10E2--- Monona, moderately eroded	50	4e	4.7	4.6	2.8	4.8
10E3--- Monona, severely eroded	60	4e	4.3	4.0	2.6	4.4
10F2--- Monona, moderately eroded	45	6e	3.5	3.4	1.6	3.5
10F3--- Monona, severely eroded	70	6e	3.2	3.0	1.4	3.2
12B--- Napier	85	2e	6.0	5.3	3.5	6.0
12C--- Napier	95	3e	5.8	5.1	3.4	5.8
17B---			4.9	4.5	2.9	4.9
Napier---	50	2e				
Kennebec, frequently flooded---	20	2w				
Nodaway, frequently flooded---	15	2w				
22D2--- Dow, moderately eroded	90	3e	4.1	4.0	2.4	4.2
22D3--- Dow, severely eroded	90	4e	3.9	3.4	2.3	3.9
22E3--- Dow, severely eroded	80	3e	3.2	3.0	1.9	3.3
26--- Kennebec, occasionally flooded	95	2w	6.1	5.1	3.6	6.2
35D2---			4.0	4.2	2.4	4.0
Liston, moderately eroded---	50	3e				
Burchard, moderately eroded---	35	3e				

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
35E2			3.4	3.2	2.0	3.4
Liston, moderately eroded	50	4e				
Burchard, moderately eroded	35	4e				
35F2			---	3.0	2.5	---
Liston, moderately eroded	40	6e				
Burchard, moderately eroded	30	6e				
35G			---	3.0	2.5	---
Liston	45	7e				
Burchard	35	7e				
54	90	2w	5.2	5.2	3.1	5.2
Zook, occasionally flooded						
54+	90	2w	5.5	5.8	3.2	5.5
Zook, overwash, occasionally flooded						
59D2	55	3e	4.3	4.2	2.6	4.4
Burchard, moderately eroded						
59E2	55	4e	3.7	3.3	2.2	3.7
Burchard, moderately eroded						
99C2	80	3e	5.4	4.1	3.2	5.4
Exira, moderately eroded						
99D2	50	3e	5.0	4.9	2.9	5.1
Exira, moderately eroded						
99E2	45	4e	4.4	4.3	2.6	4.4
Exira, moderately eroded						
100B	75	2e	6.0	5.8	3.5	6.0
Monona						
100C2	50	3e	5.6	5.5	3.3	5.6
Monona, moderately eroded						
100D2	45	3e	5.2	5.1	3.1	5.2
Monona, moderately eroded						
100D3	45	3e	5.0	4.9	2.9	5.0
Monona, severely eroded						
100E2	45	4e	4.5	4.4	2.7	4.6
Monona, moderately eroded						

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
100E3---------- Monona, severely eroded	45	4e	4.3	4.1	2.6	4.4
100F2---------- Monona, moderately eroded	55	6e	3.5	3.4	1.6	3.5
100F3---------- Monona, severely eroded	70	7e	3.2	3.0	1.4	3.2
111D3----------			4.3	4.3	2.6	4.4
Dow, severely eroded----	55	3e				
Monona, severely eroded	40	3e				
111E3----------			3.7	3.6	2.2	3.8
Dow, severely eroded----	55	4e				
Monona, severely eroded	40	4e				
125D3----------			2.8	2.3	1.6	2.8
Ida, severely eroded----	50	3e				
Chute, severely eroded--	30	7s				
125E3----------			2.5	1.8	1.5	2.5
Ida, severely eroded----	50	4e				
Chute, severely eroded--	30	7s				
133---------- Colo, occasionally flooded	85	2w	6.1	6.3	3.6	6.2
133+---------- Colo, overwash, occasionally flooded	85	2w	6.3	6.5	3.7	6.3
212---------- Kennebec, occasionally flooded	70	2w	6.1	6.6	3.6	6.2
212+---------- Kennebec, overwash, occasionally flooded	90	2w	6.1	6.6	3.6	6.2
220---------- Nodaway, occasionally flooded	75	2w	6.1	5.9	3.6	6.2
266---------- Smithland, occasionally flooded	85	2w	6.1	5.9	3.6	6.2
266+---------- Smithland, overwash, occasionally flooded	75	2w	6.1	5.9	3.6	6.2
268D---------- Knox	85	3e	5.0	4.8	2.9	5.1
268E---------- Knox	80	4e	4.4	4.2	2.6	4.4
268F---------- Knox	75	6e	3.2	3.0	1.4	3.2

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
430---------- Ackmore, occasionally flooded	75	2w	6.4	6.2	3.8	6.5
431B---------- Judson---------- Ackmore, frequently flooded---------- Colo, overwash, frequently flooded-----	55 25 15	2e 2w 2w	5.2	5.0	3.1	5.2
509B---------- Marshall, terrace	90	2e	6.3	6.2	3.7	6.4
509C---------- Marshall, terrace	85	3e	6.1	6.1	3.6	6.2
509C2---------- Marshall, terrace, moderately eroded	65	3e	5.9	5.8	3.5	6.0
509D2---------- Marshall, terrace, moderately eroded	65	3e	5.5	5.3	3.3	5.6
509E2---------- Marshall, terrace, moderately eroded	65	4e	4.9	5.3	2.9	5.0
510---------- Monona, terrace	100	1	6.1	6.0	3.6	6.2
510B---------- Monona, terrace	60	2e	6.0	5.8	3.5	6.0
510C2---------- Monona, terrace, moderately eroded	75	3e	5.6	5.5	3.3	5.6
510D2---------- Monona, terrace, moderately eroded	75	3e	5.2	5.0	3.1	5.2
510E2---------- Monona, terrace, moderately eroded	75	4e	4.5	4.2	2.7	4.6
630---------- Danbury, occasionally flooded	80	2w	6.1	5.9	3.6	6.2
670---------- Rawles, occasionally flooded	80	2w	5.6	5.5	3.3	5.6
700---------- Monona, terrace	100	1	6.1	6.0	3.6	6.2
700B---------- Monona, terrace	75	2e	6.1	6.0	3.6	6.2

See footnote at end of table.

Land Capability and Yields per Acre of Pasture--Continued

Map symbol and soil name	Pct. of map unit	Land capability	Bromegrass-alfalfa hay	Smooth bromegrass	Kentucky bluegrass	Bromegrass-alfalfa
			Tons	AUM*	AUM*	AUM*
700C2--- Monona, terrace, moderately eroded	50	3e	5.6	5.5	3.3	5.6
700D2--- Monona, terrace, moderately eroded	60	3e	5.2	5.2	3.1	5.2
717D---			---	---	---	---
Napier---	50	3e				
Gullied land, frequently flooded---	35	7e				
740D--- Hawick	90	4s	2.9	1.3	1.7	2.9
740E--- Hawick	90	6s	1.8	0.5	1.1	1.9
740F--- Hawick	90	7s	---	1.0	0.6	---
980C---			---	---	---	---
Judson---	55	3e				
Gullied land, frequently flooded---	35	7e				
1220--- Nodaway, channeled, frequently flooded	80	5w	3.0	2.7	1.3	3.0
5010. Pits, sand and gravel						
5040. Udorthents						
5080. Udorthents						
AW. Animal waste lagoon						
SL. Sewage lagoon						
W. Water						

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

Prime Farmland and Other Important Farmlands

The table “Prime Farmland and Other Important Farmlands” lists the map units in the survey area that are considered prime farmland, unique farmland, and farmland of statewide or local importance. This list does not constitute a recommendation for a particular land use.

In an effort to identify the extent and location of important farmlands, the Natural Resources Conservation Service, in cooperation with other interested Federal, State, and local government organizations, has inventoried land that can be used for the production of the Nation’s food supply.

Prime farmland is of major importance in meeting the Nation’s short- and long-range needs for food and fiber. Because the supply of high-quality farmland is limited, the U.S. Department of Agriculture recognizes that responsible levels of government, as well as individuals, should encourage and facilitate the wise use of our Nation’s prime farmland.

Prime farmland, as defined by the U.S. Department of Agriculture, is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. It could be cultivated land, pastureland, forestland, or other land, but it is not urban or built-up land or water areas. The soil quality, growing season, and moisture supply are those needed for the soil to economically produce sustained high yields of crops when proper management, including water management, and acceptable farming methods are applied. In general, prime farmland has an adequate and dependable supply of moisture from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, an acceptable salt and sodium content, and few or no rocks. The water supply is dependable and of adequate quality. Prime farmland is permeable to water and air. It is not excessively erodible or saturated with water for long periods, and it either is not frequently flooded during the growing season or is protected from flooding. Slope ranges mainly from 0 to 6 percent. More detailed information about the criteria for prime farmland is available at the local office of the Natural Resources Conservation Service.

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

For some soils identified in the table as prime farmland, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures.

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables. It has the special combination of soil quality, growing season, moisture supply, temperature, humidity, air drainage, elevation, and aspect needed for the soil to economically produce sustainable high yields of these crops when properly managed. The water supply is dependable and of adequate quality. Nearness to markets is an additional consideration. Unique farmland is not based on national criteria. It commonly is in areas where there is a special microclimate, such as the wine country in California.

In some areas, land that does not meet the criteria for prime or unique farmland is considered to be *farmland of statewide importance* for the production of food, feed, fiber, forage, and oilseed crops. The criteria for defining and delineating farmland of statewide importance are determined by the appropriate State agencies. Generally,

this land includes areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some areas may produce as high a yield as prime farmland if conditions are favorable. Farmland of statewide importance may include tracts of land that have been designated for agriculture by State law.

In some areas that are not identified as having national or statewide importance, land is considered to be *farmland of local importance* for the production of food, feed, fiber, forage, and oilseed crops. This farmland is identified by the appropriate local agencies. Farmland of local importance may include tracts of land that have been designated for agriculture by local ordinance.

Prime Farmland and Other Important Farmlands

(Only the soils considered prime or important farmland are listed. Urban or built-up areas of the soils listed are not considered prime or important farmland. If a soil is prime or important farmland only under certain conditions, such as "where drained," those conditions are specified)

Map symbol	Map unit name	Farmland classification
1C	Ida silt loam, 5 to 9 percent slopes	Farmland of statewide importance
1C3	Ida silt loam, 5 to 9 percent slopes, severely eroded	Farmland of statewide importance
1D3	Ida silt loam, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
1E3	Ida silt loam, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
8B	Judson silty clay loam, 2 to 5 percent slopes	Prime farmland
8C	Judson silty clay loam, 5 to 9 percent slopes	Farmland of statewide importance
9	Marshall silty clay loam, 0 to 2 percent slopes	Prime farmland
9B	Marshall silty clay loam, 2 to 5 percent slopes	Prime farmland
9B2	Marshall silty clay loam, 2 to 5 percent slopes, moderately eroded	Farmland of statewide importance
9C	Marshall silty clay loam, 5 to 9 percent slopes	Farmland of statewide importance
9C2	Marshall silty clay loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
9D	Marshall silty clay loam, 9 to 14 percent slopes	Farmland of statewide importance
9D2	Marshall silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
9E2	Marshall silty clay loam, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
9E3	Marshall silty clay loam, 14 to 18 percent slopes, severely eroded	Farmland of statewide importance
10B	Monona silt loam, 2 to 5 percent slopes	Prime farmland
10B2	Monona silt loam, 2 to 5 percent slopes, moderately eroded	Prime farmland
10C2	Monona silt loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
10D2	Monona silt loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
10D3	Monona silt loam, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
10E2	Monona silt loam, 14 to 20 percent slopes, moderately eroded	Farmland of statewide importance
10E3	Monona silt loam, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
12B	Napier silt loam, 2 to 5 percent slopes	Prime farmland
12C	Napier silt loam, 5 to 9 percent slopes	Farmland of statewide importance
17B	Napier-Kennebec-Nodaway complex, 2 to 5 percent slopes	Prime farmland
22D2	Dow silt loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
22D3	Dow silt loam, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
22E3	Dow silt loam, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
26	Kennebec silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
35D2	Liston-Burchard complex, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
35E2	Liston-Burchard complex, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
54	Zook silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
54+	Zook silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland where drained
59D2	Burchard clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
59E2	Burchard clay loam, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
99C2	Exira silty clay loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
99D2	Exira silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
99E2	Exira silty clay loam, 14 to 18 percent slopes, moderately eroded	Farmland of statewide importance
100B	Monona silty clay loam, 2 to 5 percent slopes	Prime farmland
100C2	Monona silty clay loam, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
100D2	Monona silty clay loam, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
100D3	Monona silty clay loam, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance

Prime Farmland and Other Important Farmlands--Continued

Map symbol	Map unit name	Farmland classification
100E2	Monona silty clay loam, 14 to 20 percent slopes, moderately eroded	Farmland of statewide importance
100E3	Monona silty clay loam, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
111D3	Dow-Monona complex, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
111E3	Dow-Monona complex, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
125D3	Ida-Chute complex, 9 to 14 percent slopes, severely eroded	Farmland of statewide importance
125E3	Ida-Chute complex, 14 to 20 percent slopes, severely eroded	Farmland of statewide importance
133	Colo silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland where drained
133+	Colo silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland where drained
212	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
212+	Kennebec silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland
220	Nodaway silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
266	Smithland silty clay loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
266+	Smithland silt loam, 0 to 2 percent slopes, occasionally flooded, overwash	Prime farmland
268D	Knox silt loam, 9 to 14 percent slopes	Farmland of statewide importance
268E	Knox silt loam, 14 to 20 percent slopes	Farmland of statewide importance
430	Ackmore silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
431B	Judson-Ackmore-Colo, overwash, complex, 2 to 5 percent slopes	Prime farmland where drained
509B	Marshall silty clay loam, terrace, 2 to 5 percent slopes	Prime farmland
509C	Marshall silty clay loam, terrace, 5 to 9 percent slopes	Farmland of statewide importance
509C2	Marshall silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
509D2	Marshall silty clay loam, terrace, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
509E2	Marshall silty clay loam, terrace, 14 to 20 percent slopes, moderately eroded	Farmland of statewide importance
510	Monona silt loam, terrace, 0 to 2 percent slopes	Prime farmland
510B	Monona silt loam, terrace, 2 to 5 percent slopes	Prime farmland
510C2	Monona silt loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
510D2	Monona silt loam, terrace, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
510E2	Monona silt loam, terrace, 14 to 20 percent slopes, moderately eroded	Farmland of statewide importance
630	Danbury silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
670	Rawles silt loam, 0 to 2 percent slopes, occasionally flooded	Prime farmland
700	Monona silty clay loam, terrace, 0 to 2 percent slopes	Prime farmland
700B	Monona silty clay loam, terrace, 2 to 5 percent slopes	Prime farmland
700C2	Monona silty clay loam, terrace, 5 to 9 percent slopes, moderately eroded	Farmland of statewide importance
700D2	Monona silty clay loam, terrace, 9 to 14 percent slopes, moderately eroded	Farmland of statewide importance
740D	Hawick gravelly sandy loam, 9 to 14 percent slopes	Farmland of statewide importance
980C	Judson-Gullied land complex, 5 to 9 percent slopes	Farmland of statewide importance

Agricultural Waste Management

The table "Agricultural Waste Management" is described in this section.

Soil properties are important considerations in areas where soils are used as sites for the treatment and disposal of organic waste and wastewater. Selection of soils with properties that favor waste management can help to prevent environmental damage.

This table shows the degree and kind of soil limitations affecting the treatment of agricultural waste, including municipal and food-processing wastewater and effluent from lagoons or storage ponds. Municipal wastewater is the waste stream from a municipality. It contains domestic waste and may contain industrial waste. It may have received primary or secondary treatment. It is rarely untreated sewage. Food-processing wastewater results from the preparation of fruits, vegetables, milk, cheese, and meats for public consumption. In places it is high in content of sodium and chloride. In the context of this table, the effluent in lagoons and storage ponds is from facilities used to treat or store food-processing wastewater or domestic or animal waste. Domestic and food-processing wastewater is very dilute, and the effluent from the facilities that treat or store it commonly is very low in content of carbonaceous and nitrogenous material; the content of nitrogen commonly ranges from 10 to 30 milligrams per liter. The wastewater from animal waste treatment lagoons or storage ponds, however, has much higher concentrations of these materials, mainly because the manure has not been diluted as much as the domestic waste. The content of nitrogen in this wastewater generally ranges from 50 to 2,000 milligrams per liter. When wastewater is applied, checks should be made to ensure that nitrogen, heavy metals, and salts are not added in excessive amounts.

The ratings in the table are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect agricultural waste management. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Application of manure and food-processing waste not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. Manure is the excrement of livestock and poultry, and food-processing waste is damaged fruit and vegetables and the peelings, stems, leaves, pits, and soil particles removed in food preparation. The manure and food-processing waste are solid, slurry, or liquid. Their nitrogen content varies. A high content of nitrogen limits the application rate. Toxic or otherwise dangerous wastes, such as those mixed with the lye used in food processing, are not considered in the ratings.

The ratings are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the waste is applied, and the method by which the waste is applied. The properties that affect absorption include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a

cemented pan, and available water capacity. The properties that affect plant growth and microbial activity include reaction, the sodium adsorption ratio, salinity, and bulk density. The wind erodibility group, the soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of waste. Permanently frozen soils are unsuitable for waste treatment.

Application of sewage sludge not only disposes of waste material but also can improve crop production by increasing the supply of nutrients in the soils where the material is applied. In the context of this table, sewage sludge is the residual product of the treatment of municipal sewage. The solid component consists mainly of cell mass, primarily bacteria cells that developed during secondary treatment and have incorporated soluble organics into their own bodies. The sludge has small amounts of sand, silt, and other solid debris. The content of nitrogen varies. Some sludge has constituents that are toxic to plants or hazardous to the food chain, such as heavy metals and exotic organic compounds, and should be analyzed chemically prior to use.

The content of water in the sludge ranges from about 98 percent to less than 40 percent. The sludge is considered liquid if it is more than about 90 percent water, slurry if it is about 50 to 90 percent water, and solid if it is less than about 50 percent water.

The ratings in the table are based on the soil properties that affect absorption, plant growth, microbial activity, erodibility, the rate at which the sludge is applied, and the method by which the sludge is applied. The properties that affect absorption, plant growth, and microbial activity include permeability, depth to a water table, ponding, the sodium adsorption ratio, depth to bedrock or a cemented pan, available water capacity, reaction, salinity, and bulk density. The wind erodibility group, the soil erosion factor K, and slope are considered in estimating the likelihood that wind erosion or water erosion will transport the waste material from the application site. Stones, cobbles, a water table, ponding, and flooding can hinder the application of sludge. Permanently frozen soils are unsuitable for waste treatment.

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding. The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

A soil feature considered in the ratings for application of manure, sewage sludge, and wastewater is depth to the top of a water table (saturated zone). During August, September, and October, this depth is generally more than 60 cm in normal years. For soils that are limited by wetness, “Nov-Jul” indicates the most problematic months of the year for application of manure, sewage sludge, and wastewater. These soils may be slow to drain and can become waterlogged and boggy during periods of heavy precipitation.

Agricultural Waste Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Not limited		Not limited		Somewhat limited Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
1C3:							
Ida, severely eroded	80	Not limited		Not limited		Somewhat limited Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
1D3:							
Ida, severely eroded	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
1E3:							
Ida, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
1F3:							
Ida, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application	1.00
						Too steep for surface application	1.00
8B:							
Judson	80	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
8C:							
Judson	95	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
9:							
Marshall	95	Not limited		Not limited		Not limited	
9B:							
Marshall	100	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
9B2:							
Marshall, moderately eroded	85	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
9C:							
Marshall	90	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
9C2:							
Marshall, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
9D:							
Marshall	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
9E2:							
Marshall, moderately eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
9E3:							
Marshall, severely eroded	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
10B:							
Monona	100	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
10B2:							
Monona, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
10C2:							
Monona, moderately eroded	75	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D2: Monona, moderately eroded	60	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78
10D3: Monona, severely eroded	95	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78
10E2: Monona, moderately eroded	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
10E3: Monona, severely eroded	60	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application Too steep for sprinkler application	1.00 1.00
10F2: Monona, moderately eroded	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application Too steep for surface application	1.00 1.00
10F3: Monona, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for sprinkler application Too steep for surface application	1.00 1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12B:							
Napier	85	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption Too steep for surface application	1.00 0.08
12C:							
Napier	95	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption Too steep for surface application Too steep for sprinkler application	1.00 0.92 0.02
17B:							
Napier	50	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00	Very limited Low adsorption Too steep for surface application	1.00 0.08
Kennebec, frequently flooded	20	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Too steep for surface application	1.00 0.08
Nodaway, frequently flooded	15	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding Too steep for surface application	1.00 0.08
22D2:							
Dow, moderately eroded	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78
22D3:							
Dow, severely eroded	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Too steep for surface application Too steep for sprinkler application	1.00 0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22E3:							
Dow, severely eroded	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
26:							
Kennebec, occasionally flooded	95	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Too acid	0.01	Too acid	0.01	Too acid	0.01
35D2:							
Liston, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	0.78
						Slow water movement	0.22
Burchard, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for sprinkler application	0.78
						Slow water movement	0.31
35E2:							
Liston, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for sprinkler application	1.00
						Slow water movement	0.22

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35E2:							
Burchard, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for sprinkler application	1.00
						Slow water movement	0.31
35F2:							
Liston, moderately eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
						Slow water movement	0.22
Burchard, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for surface application	1.00
						Slow water movement	0.31
35G:							
Liston	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Slow water movement	0.30	Slow water movement	0.22	Too steep for surface application	1.00
						Slow water movement	0.22
Burchard	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for surface application	1.00
						Slow water movement	0.31

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Flooding	1.00	Slow water movement	1.00
		Flooding	0.60	Slow water movement		Flooding	0.60
54+:							
Zook, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Depth to saturated zone (Nov-Jul)	1.00	Flooding	1.00	Slow water movement	1.00
		Flooding	0.60	Slow water movement		Flooding	0.60
59D2:							
Burchard, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for sprinkler application	0.78
						Slow water movement	0.31
59E2:							
Burchard, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Slow water movement	0.41	Slow water movement	0.31	Too steep for sprinkler application	1.00
						Slow water movement	0.31
99C2:							
Exira, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99D2:							
Exira, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
99E2:							
Exira, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
100B:							
Monona	75	Not limited		Not limited		Not limited	
100C2:							
Monona, moderately eroded	50	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
100D2:							
Monona, moderately eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
100D3:							
Monona, severely eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100E2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
100E3:							
Monona, severely eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
100F2:							
Monona, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
						Too steep for surface application	1.00
100F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
						Too steep for surface application	1.00
111D3:							
Dow, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
Monona, severely eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
Monona, severely eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
125D3:							
Ida, severely eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
		Leaching	0.45	Droughty	0.21	Too steep for sprinkler application	0.78
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Leaching	0.45	Droughty	0.21	Too steep for sprinkler application	1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
133: Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.70	Flooding	1.00	Flooding	0.60
		Flooding	0.60				
133+: Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.70	Flooding	1.00	Flooding	0.60
		Flooding	0.60				
212: Kennebec, occasionally flooded	70	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
212+: Kennebec, overwash, occasionally flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
220: Nodaway, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
266: Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.70	Flooding	1.00	Flooding	0.60
		Flooding	0.60				
266+: Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Leaching	0.70	Flooding	1.00	Flooding	0.60
		Flooding	0.60				

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
268D:							
Knox	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
268E:							
Knox	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
268F:							
Knox	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for sprinkler application	1.00
						Too steep for surface application	1.00
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Flooding	1.00	Flooding	0.60
		Slow water movement	0.41	Slow water movement	0.31	Slow water movement	0.31
431B:							
Judson	55	Not limited		Not limited		Not limited	
Ackmore, frequently flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Colo, overwash, frequently flooded	15	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Leaching	0.70				
509B:							
Marshall, terrace	90	Not limited		Not limited		Not limited	

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
509C:							
Marshall, terrace---	85	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
509C2:							
Marshall, terrace, moderately eroded--	65	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02
509D2:							
Marshall, terrace, moderately eroded--	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
509E2:							
Marshall, terrace, moderately eroded--	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
510:							
Monona, terrace-----	100	Not limited		Not limited		Not limited	
510B:							
Monona, terrace-----	60	Not limited		Not limited		Not limited	
510C2:							
Monona, terrace, moderately eroded--	75	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
510D2:							
Monona, terrace, moderately eroded--	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
						Too steep for sprinkler application	1.00
630:							
Danbury, occasionally flooded----------	80	Very limited		Very limited		Very limited	
		Depth to saturated zone (Nov-Jul)	1.00	Flooding	1.00	Depth to saturated zone (Nov-Jul)	1.00
		Flooding	0.60	Depth to saturated zone (Nov-Jul)	1.00	Flooding	0.60
		Slow water movement	0.41	Slow water movement	0.31	Slow water movement	0.31
670:							
Rawles, occasionally flooded----------	80	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
700:							
Monona, terrace-----	100	Not limited		Not limited		Not limited	
700B:							
Monona, terrace-----	75	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.08
700C2:							
Monona, terrace, moderately eroded--	50	Not limited		Not limited		Somewhat limited	
						Too steep for surface application	0.92
						Too steep for sprinkler application	0.02

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
700D2:							
Monona, terrace, moderately eroded--	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Too steep for surface application	1.00
						Too steep for sprinkler application	0.78
717D:							
Napier----------	50	Very limited		Very limited		Very limited	
		Low adsorption	1.00	Low adsorption	1.00	Low adsorption	1.00
		Slope	0.04	Slope	0.04	Too steep for surface application	1.00
						Too steep for sprinkler application	0.22
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Droughty	0.91	Droughty	0.91	Too steep for surface application	1.00
		Slope	0.63	Slope	0.63	Droughty	0.91
740E:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Droughty	0.91	Droughty	0.91	Too steep for sprinkler application	1.00
740F:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Filtering capacity	1.00	Slope	1.00	Too steep for sprinkler application	1.00
		Droughty	0.91	Droughty	0.91	Too steep for surface application	1.00

Agricultural Waste Management--Continued

Map symbol and soil name	Pct. of map unit	Application of manure and food-processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
980C:							
Judson	55	Not limited		Not limited		Somewhat limited Too steep for surface application Too steep for sprinkler application	0.92 0.02
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Recreational Development

The titles of the tables described in this section are:

- "Camp Areas, Picnic Areas, and Playgrounds"
- "Paths, Trails, and Golf Fairways"

In the tables described in this section, the soils of the survey area are rated according to limitations that affect their suitability for recreational development. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the recreational uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

The ratings in the tables are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation also are important. Soils that are subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

The information in these tables can be supplemented by other information in this survey, for example, interpretations for dwellings without basements, for local roads and streets, and for septic tank absorption fields.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas. The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the

surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The ratings are based on the soil properties that affect the ease of developing picnic areas and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of picnic areas. For good trafficability, the surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Playgrounds require soils that are nearly level, are free of stones, and can withstand intensive foot traffic. The ratings are based on the soil properties that affect the ease of developing playgrounds and that influence trafficability and the growth of vegetation after development. Slope and stoniness are the main concerns affecting the development of playgrounds. For good trafficability, the surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

Paths and trails for hiking and horseback riding should require little or no slope modification through cutting and filling. The ratings are based on the soil properties that affect trafficability and erodibility. These properties are stoniness, depth to a water table, ponding, flooding, slope, and texture of the surface layer.

Off-road motorcycle trails require little or no site preparation. They are not covered with surfacing material or vegetation. Considerable compaction of the soil material is likely. The ratings are based on the soil properties that influence erodibility, trafficability, dustiness, and the ease of revegetation. These properties are stoniness, slope, depth to a water table, ponding, flooding, and texture of the surface layer.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer. The suitability of the soil for traps, tees, roughs, and greens is not considered in the ratings.

Camp Areas, Picnic Areas, and Playgrounds

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Not limited		Not limited		Very limited Slope	1.00
1C3:							
Ida, severely eroded	80	Not limited		Not limited		Very limited Slope	1.00
1D3:							
Ida, severely eroded	80	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
1E3:							
Ida, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1F3:							
Ida, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
8B:							
Judson	80	Not limited		Not limited		Somewhat limited Slope	0.50
8C:							
Judson	95	Not limited		Not limited		Very limited Slope	1.00
9:							
Marshall	95	Not limited		Not limited		Not limited	
9B:							
Marshall	100	Not limited		Not limited		Somewhat limited Slope	0.50
9B2:							
Marshall, moderately eroded	85	Not limited		Not limited		Somewhat limited Slope	0.50
9C:							
Marshall	90	Not limited		Not limited		Very limited Slope	1.00
9C2:							
Marshall, moderately eroded	80	Not limited		Not limited		Very limited Slope	1.00
9D:							
Marshall	85	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D2: Marshall, moderately eroded	70	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
9E2: Marshall, moderately eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
9E3: Marshall, severely eroded	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
10B: Monona	100	Not limited		Not limited		Somewhat limited Slope	0.50
10B2: Monona, moderately eroded	80	Not limited		Not limited		Somewhat limited Slope	0.50
10C2: Monona, moderately eroded	75	Not limited		Not limited		Very limited Slope	1.00
10D2: Monona, moderately eroded	60	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
10D3: Monona, severely eroded	95	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
10E2: Monona, moderately eroded	50	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
10E3: Monona, severely eroded	60	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
10F2: Monona, moderately eroded	45	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
10F3: Monona, severely eroded	70	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12B:							
Napier	85	Not limited		Not limited		Somewhat limited Slope	0.50
12C:							
Napier	95	Not limited		Not limited		Very limited Slope	1.00
17B:							
Napier	50	Not limited		Not limited		Somewhat limited Slope	0.50
Kennebec, frequently flooded	20	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding Slope	1.00 0.50
Nodaway, frequently flooded	15	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding Slope	1.00 0.50
22D2:							
Dow, moderately eroded	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
22D3:							
Dow, severely eroded	90	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
22E3:							
Dow, severely eroded	80	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
26:							
Kennebec, occasionally flooded	95	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
35D2:							
Liston, moderately eroded	50	Somewhat limited Slope Slow water movement	0.63 0.15	Somewhat limited Slope Slow water movement	0.63 0.15	Very limited Slope Slow water movement	1.00 0.15
Burchard, moderately eroded	35	Somewhat limited Slope Slow water movement	0.63 0.21	Somewhat limited Slope Slow water movement	0.63 0.21	Very limited Slope Slow water movement	1.00 0.21

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35E2:							
Liston, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Burchard, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
35F2:							
Liston, moderately eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Burchard, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
35G:							
Liston	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.15	Slow water movement	0.15	Slow water movement	0.15
Burchard	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.94	Slow water movement	0.94
		Slow water movement	0.94			Flooding	0.60
54+:							
Zook, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.94	Slow water movement	0.94
		Slow water movement	0.94			Flooding	0.60

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
59D2:							
Burchard, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
59E2:							
Burchard, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Slow water movement	0.21	Slow water movement	0.21	Slow water movement	0.21
99C2:							
Exira, moderately eroded	80	Not limited		Not limited		Very limited	
						Slope	1.00
99D2:							
Exira, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
99E2:							
Exira, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100B:							
Monona	75	Not limited		Not limited		Somewhat limited	
						Slope	0.12
100C2:							
Monona, moderately eroded	50	Not limited		Not limited		Very limited	
						Slope	1.00
100D2:							
Monona, moderately eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
100D3:							
Monona, severely eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
100E2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100E3:							
Monona, severely eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100F2:							
Monona, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
111D3:							
Dow, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Monona, severely eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Monona, severely eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
125D3:							
Ida, severely eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Chute, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.76	Too sandy	0.76	Slope	1.00
		Slope	0.63	Slope	0.63	Too sandy	0.76
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too sandy	0.76	Too sandy	0.76	Too sandy	0.76
133:							
Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60
133+:							
Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
212:							
Kennebec, occasionally flooded	70	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
212+:							
Kennebec, overwash, occasionally flooded	90	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
220:							
Nodaway, occasionally flooded	75	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
266:							
Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60
266+:							
Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00			Flooding	0.60
268D:							
Knox	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
268E:							
Knox	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
268F:							
Knox	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Slow water movement	0.21	Flooding	0.60
		Slow water movement	0.21			Slow water movement	0.21
431B:							
Judson	55	Not limited		Not limited		Somewhat limited	
						Slope	0.12

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
431B:							
Ackmore, frequently flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40	Flooding	1.00
						Slope	0.12
Colo, overwash, frequently flooded	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	1.00	Flooding	0.40	Flooding	1.00
						Slope	0.12
509B:							
Marshall, terrace---	90	Not limited		Not limited		Somewhat limited	
						Slope	0.12
509C:							
Marshall, terrace---	85	Not limited		Not limited		Very limited	
						Slope	1.00
509C2:							
Marshall, terrace, moderately eroded--	65	Not limited		Not limited		Very limited	
						Slope	1.00
509D2:							
Marshall, terrace, moderately eroded--	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
509E2:							
Marshall, terrace, moderately eroded--	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
510:							
Monona, terrace-----	100	Not limited		Not limited		Not limited	
510B:							
Monona, terrace-----	60	Not limited		Not limited		Somewhat limited	
						Slope	0.12
510C2:							
Monona, terrace, moderately eroded--	75	Not limited		Not limited		Very limited	
						Slope	1.00
510D2:							
Monona, terrace, moderately eroded--	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
630:							
Danbury, occasionally flooded	80	Very limited		Somewhat limited		Somewhat limited	
		Flooding	1.00	Slow water	0.21	Flooding	0.60
		Depth to saturated zone	0.39	movement		Depth to saturated zone	0.39
		Slow water movement	0.21	Depth to saturated zone	0.19	Slow water movement	0.21
670:							
Rawles, occasionally flooded	80	Very limited		Not limited		Somewhat limited	
		Flooding	1.00			Flooding	0.60
700:							
Monona, terrace	100	Not limited		Not limited		Not limited	
700B:							
Monona, terrace	75	Not limited		Not limited		Somewhat limited	
						Slope	0.50
700C2:							
Monona, terrace, moderately eroded	50	Not limited		Not limited		Very limited	
						Slope	1.00
700D2:							
Monona, terrace, moderately eroded	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
717D:							
Napier	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Slope	1.00
		Slope	0.63	Slope	0.63	Too sandy	1.00
						Gravel content	0.90
740E:							
Hawick	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Slope	1.00
		Slope	1.00	Slope	1.00	Too sandy	1.00
						Gravel content	0.90
740F:							
Hawick	90	Very limited		Very limited		Very limited	
		Slope	1.00	Too sandy	1.00	Slope	1.00
		Too sandy	1.00	Slope	1.00	Too sandy	1.00
						Gravel content	0.90

Camp Areas, Picnic Areas, and Playgrounds--Continued

Map symbol and soil name	Pct. of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
980C:							
Judson	55	Not limited		Not limited		Very limited Slope	1.00
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Paths, Trails, and Golf Fairways

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Not limited		Not limited		Not limited	
1C3:							
Ida, severely eroded	80	Not limited		Not limited		Not limited	
1D3:							
Ida, severely eroded	80	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
1E3:							
Ida, severely eroded	70	Very limited Water erosion Slope	1.00 0.08	Very limited Water erosion	1.00	Very limited Slope	1.00
1F3:							
Ida, severely eroded	70	Very limited Water erosion Slope	1.00 1.00	Very limited Water erosion	1.00	Very limited Slope	1.00
8B:							
Judson	80	Not limited		Not limited		Not limited	
8C:							
Judson	95	Not limited		Not limited		Not limited	
9:							
Marshall	95	Not limited		Not limited		Not limited	
9B:							
Marshall	100	Not limited		Not limited		Not limited	
9B2:							
Marshall, moderately eroded	85	Not limited		Not limited		Not limited	
9C:							
Marshall	90	Not limited		Not limited		Not limited	
9C2:							
Marshall, moderately eroded	80	Not limited		Not limited		Not limited	
9D:							
Marshall	85	Not limited		Not limited		Somewhat limited Slope	0.63
9D2:							
Marshall, moderately eroded	70	Not limited		Not limited		Somewhat limited Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9E2:							
Marshall, moderately eroded	70	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Slope	1.00
9E3:							
Marshall, severely eroded	75	Somewhat limited		Not limited		Very limited	
		Slope	0.02			Slope	1.00
10B:							
Monona	100	Not limited		Not limited		Not limited	
10B2:							
Monona, moderately eroded	80	Not limited		Not limited		Not limited	
10C2:							
Monona, moderately eroded	75	Not limited		Not limited		Not limited	
10D2:							
Monona, moderately eroded	60	Not limited		Not limited		Somewhat limited	
						Slope	0.63
10D3:							
Monona, severely eroded	95	Very limited		Very limited		Somewhat limited	
		Water erosion	1.00	Water erosion	1.00	Slope	0.63
10E2:							
Monona, moderately eroded	50	Somewhat limited		Not limited		Very limited	
		Slope	0.08			Slope	1.00
10E3:							
Monona, severely eroded	60	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	0.08				
10F2:							
Monona, moderately eroded	45	Very limited		Not limited		Very limited	
		Slope	1.00			Slope	1.00
10F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Water erosion	1.00	Water erosion	1.00	Slope	1.00
		Slope	1.00				
12B:							
Napier	85	Not limited		Not limited		Not limited	
12C:							
Napier	95	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
17B:							
Napier	50	Not limited		Not limited		Not limited	
Kennebec, frequently flooded	20	Somewhat limited Flooding	 0.40	Somewhat limited Flooding	 0.40	Very limited Flooding	 1.00
Nodaway, frequently flooded	15	Somewhat limited Flooding	 0.40	Somewhat limited Flooding	 0.40	Very limited Flooding	 1.00
22D2:							
Dow, moderately eroded	90	Very limited Water erosion	 1.00	Very limited Water erosion	 1.00	Somewhat limited Slope	 0.63
22D3:							
Dow, severely eroded	90	Very limited Water erosion	 1.00	Very limited Water erosion	 1.00	Somewhat limited Slope	 0.63
22E3:							
Dow, severely eroded	80	Very limited Water erosion Slope	 1.00 0.08	Very limited Water erosion	 1.00	Very limited Slope	 1.00
26:							
Kennebec, occasionally flooded	95	Not limited		Not limited		Somewhat limited Flooding	 0.60
35D2:							
Liston, moderately eroded	50	Not limited		Not limited		Somewhat limited Slope	 0.63
Burchard, moderately eroded	35	Not limited		Not limited		Somewhat limited Slope	 0.63
35E2:							
Liston, moderately eroded	50	Somewhat limited Slope	 0.02	Not limited		Very limited Slope	 1.00
Burchard, moderately eroded	35	Somewhat limited Slope	 0.02	Not limited		Very limited Slope	 1.00
35F2:							
Liston, moderately eroded	40	Somewhat limited Slope	 0.68	Not limited		Very limited Slope	 1.00
Burchard, moderately eroded	30	Somewhat limited Slope	 0.68	Not limited		Very limited Slope	 1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35G:							
Liston	45	Very limited Slope	1.00	Somewhat limited Slope	0.56	Very limited Slope	1.00
Burchard	35	Very limited Slope	1.00	Somewhat limited Slope	0.56	Very limited Slope	1.00
54:							
Zook, occasionally flooded	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
54+:							
Zook, overwash, occasionally flooded	90	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
59D2:							
Burchard, moderately eroded	55	Not limited		Not limited		Somewhat limited Slope	0.63
59E2:							
Burchard, moderately eroded	55	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
99C2:							
Exira, moderately eroded	80	Not limited		Not limited		Not limited	
99D2:							
Exira, moderately eroded	50	Not limited		Not limited		Somewhat limited Slope	0.63
99E2:							
Exira, moderately eroded	45	Somewhat limited Slope	0.02	Not limited		Very limited Slope	1.00
100B:							
Monona	75	Not limited		Not limited		Not limited	
100C2:							
Monona, moderately eroded	50	Not limited		Not limited		Not limited	
100D2:							
Monona, moderately eroded	45	Not limited		Not limited		Somewhat limited Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100D3:							
Monona, severely eroded	45	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
100E2:							
Monona, moderately eroded	45	Somewhat limited Slope	0.08	Not limited		Very limited Slope	1.00
100E3:							
Monona, severely eroded	45	Somewhat limited Slope	0.08	Not limited		Very limited Slope	1.00
100F2:							
Monona, moderately eroded	55	Very limited Slope	1.00	Not limited		Very limited Slope	1.00
100F3:							
Monona, severely eroded	70	Very limited Water erosion Slope	1.00 1.00	Very limited Water erosion	1.00	Very limited Slope	1.00
111D3:							
Dow, severely eroded	55	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
Monona, severely eroded	40	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
111E3:							
Dow, severely eroded	55	Very limited Water erosion Slope	1.00 0.08	Very limited Water erosion	1.00	Very limited Slope	1.00
Monona, severely eroded	40	Very limited Water erosion Slope	1.00 0.08	Very limited Water erosion	1.00	Very limited Slope	1.00
125D3:							
Ida, severely eroded	50	Very limited Water erosion	1.00	Very limited Water erosion	1.00	Somewhat limited Slope	0.63
Chute, severely eroded	30	Somewhat limited Too sandy	0.76	Somewhat limited Too sandy	0.76	Somewhat limited Slope Droughty	0.63 0.22
125E3:							
Ida, severely eroded	50	Very limited Water erosion Slope	1.00 0.08	Very limited Water erosion	1.00	Very limited Slope	1.00

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
125E3:							
Chute, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Too sandy	0.76	Too sandy	0.76	Slope	1.00
		Slope	0.08			Droughty	0.22
133:							
Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
133+:							
Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
212:							
Kennebec, occasionally flooded	70	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
212+:							
Kennebec, overwash, occasionally flooded	90	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
220:							
Nodaway, occasionally flooded	75	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
266:							
Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
266+:							
Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
						Flooding	0.60
268D:							
Knox	85	Not limited		Not limited		Somewhat limited	
						Slope	0.63

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
268E:							
Knox	80	Somewhat limited Slope	0.08	Not limited		Very limited Slope	1.00
268F:							
Knox	75	Very limited Slope	1.00	Not limited		Very limited Slope	1.00
430:							
Ackmore, occasionally flooded	75	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Flooding	1.00 0.60
431B:							
Judson	55	Not limited		Not limited		Not limited	
Ackmore, frequently flooded	25	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
Colo, overwash, frequently flooded	15	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
509B:							
Marshall, terrace	90	Not limited		Not limited		Not limited	
509C:							
Marshall, terrace	85	Not limited		Not limited		Not limited	
509C2:							
Marshall, terrace, moderately eroded	65	Not limited		Not limited		Not limited	
509D2:							
Marshall, terrace, moderately eroded	65	Not limited		Not limited		Somewhat limited Slope	0.63
509E2:							
Marshall, terrace, moderately eroded	65	Somewhat limited Slope	0.08	Not limited		Very limited Slope	1.00
510:							
Monona, terrace	100	Not limited		Not limited		Not limited	
510B:							
Monona, terrace	60	Not limited		Not limited		Not limited	

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
510C2:							
Monona, terrace, moderately eroded--	75	Not limited		Not limited		Not limited	
510D2:							
Monona, terrace, moderately eroded--	75	Not limited		Not limited		Somewhat limited	
						Slope	0.63
510E2:							
Monona, terrace, moderately eroded--	75	Somewhat limited		Not limited		Very limited	
		Slope	0.08			Slope	1.00
630:							
Danbury, occasionally flooded----------	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
						Depth to saturated zone	0.19
670:							
Rawles, occasionally flooded----------	80	Not limited		Not limited		Somewhat limited	
						Flooding	0.60
700:							
Monona, terrace-----	100	Not limited		Not limited		Not limited	
700B:							
Monona, terrace-----	75	Not limited		Not limited		Not limited	
700C2:							
Monona, terrace, moderately eroded--	50	Not limited		Not limited		Not limited	
700D2:							
Monona, terrace, moderately eroded--	60	Not limited		Not limited		Somewhat limited	
						Slope	0.63
717D:							
Napier----------	50	Not limited		Not limited		Somewhat limited	
						Slope	0.04
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Droughty	0.99
						Slope	0.63
740E:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Slope	1.00
		Slope	0.02			Droughty	0.99

Paths, Trails, and Golf Fairways--Continued

Map symbol and soil name	Pct. of map unit	Paths and trails		Off-road motorcycle trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
740F:							
Hawick	90	Very limited		Very limited		Very limited	
		Too sandy	1.00	Too sandy	1.00	Slope	1.00
		Slope	0.82			Droughty	0.99
980C:							
Judson	55	Not limited		Not limited		Not limited	
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Somewhat limited		Somewhat limited		Very limited	
		Flooding	0.40	Flooding	0.40	Flooding	1.00
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. Ratings are given for building site development, sanitary facilities, construction materials, and water management. The ratings are based on observed performance of the soils and on the data in the tables described under the heading "Soil Properties."

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil between the surface and a depth of 5 to 7 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about particle-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 to 7 feet of the surface, soil wetness, depth to a water table, ponding, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kinds of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, reclamation material, roadfill, and topsoil; plan structures for water management; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

The titles of the tables described in this section are:

- "Dwellings and Small Commercial Buildings"
- "Roads and Streets, Shallow Excavations, and Lawns and Landscaping"

Soil properties influence the development of building sites, including the selection of the site, the design of the structure, construction, performance after construction, and maintenance. The tables described in this section show the degree and kind of soil limitations that affect dwellings with and without basements, small commercial buildings, local roads and streets, shallow excavations, and lawns and landscaping.

The ratings in the tables are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect building site development. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Dwellings are single-family houses of three stories or less. For dwellings without basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. For dwellings with basements, the foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of about 7 feet. The ratings for dwellings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility. Compressibility is inferred from the Unified classification. The properties that affect the ease and amount of excavation include depth to a water table, ponding, flooding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Small commercial buildings are structures that are less than three stories high and do not have basements. The foundation is assumed to consist of spread footings of reinforced concrete built on undisturbed soil at a depth of 2 feet or at the depth of maximum frost penetration, whichever is deeper. The ratings are based on the soil properties that affect the capacity of the soil to support a load without movement and on the properties that affect excavation and construction costs. The properties that affect the load-supporting capacity include depth to a water table, ponding, flooding, subsidence, linear extensibility (shrink-swell potential), and compressibility (which is inferred from the Unified classification). The properties that affect the ease and amount of excavation include flooding, depth to a water table, ponding, slope, depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, and the amount and size of rock fragments.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or soil material stabilized by lime or cement; and a surface of flexible material (asphalt), rigid material (concrete), or gravel with a binder. The ratings are based on the soil properties that affect the ease of excavation and grading and the traffic-supporting capacity. The properties that affect the ease of excavation and grading are depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, depth to a water table, ponding, flooding, the amount of large stones, and slope. The properties that affect the traffic-supporting capacity are soil strength (as inferred from the AASHTO group index number), subsidence, linear extensibility (shrink-swell potential), the potential for frost action, depth to a water table, and ponding.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for graves, utility lines, open ditches, or other purposes. The ratings are based on the soil properties that influence the ease of digging and the resistance to sloughing. Depth to bedrock or a cemented pan, hardness of bedrock or a cemented pan, the amount of large stones, and dense layers influence the ease of digging, filling, and compacting. Depth to the seasonal high water table, flooding, and ponding may restrict the period when excavations can be made. Slope influences the ease of using machinery. Soil texture, depth to the water table, and linear extensibility (shrink-swell potential) influence the resistance to sloughing.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. Irrigation is not considered in the ratings. The ratings are based on the soil properties that affect plant growth and trafficability after vegetation is established. The properties that affect plant growth are reaction; depth to a water table; ponding; depth to bedrock or a cemented pan; the available water capacity in the upper 40 inches; the content of salts, sodium, or calcium carbonate; and sulfidic materials. The properties that affect trafficability are flooding, depth to a water table, ponding, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer.

Dwellings and Small Commercial Buildings

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
1C3:							
Ida, severely eroded	80	Not limited		Not limited		Somewhat limited	
						Slope	0.88
1D3:							
Ida, severely eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
1E3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
1F3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
8B:							
Judson	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
8C:							
Judson	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
9:							
Marshall	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9B:							
Marshall	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9B2:							
Marshall, moderately eroded	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9C:							
Marshall	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D:							
Marshall	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9E2:							
Marshall, moderately eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
9E3:							
Marshall, severely eroded	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
10B:							
Monona	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
10B2:							
Monona, moderately eroded	80	Not limited		Not limited		Not limited	
10C2:							
Monona, moderately eroded	75	Not limited		Not limited		Somewhat limited	
						Slope	0.88
10D2:							
Monona, moderately eroded	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
10D3:							
Monona, severely eroded	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
10E2:							
Monona, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
10E3:							
Monona, severely eroded	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10F2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
10F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
12B:							
Napier	85	Not limited		Not limited		Not limited	
12C:							
Napier	95	Not limited		Not limited		Somewhat limited	
						Slope	0.88
17B:							
Napier	50	Not limited		Not limited		Not limited	
Kennebec, frequently flooded	20	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
Nodaway, frequently flooded	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
22D2:							
Dow, moderately eroded	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
22D3:							
Dow, severely eroded	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
22E3:							
Dow, severely eroded	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
26:							
Kennebec, occasionally flooded	95	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
				Depth to saturated zone	0.61		

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35D2:							
Liston, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Burchard, moderately eroded	35	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
35E2:							
Liston, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Burchard, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
35F2:							
Liston, moderately eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Burchard, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
35G:							
Liston	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Burchard	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00
54+:							
Zook, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	1.00	Shrink-swell	1.00	Shrink-swell	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
59D2:							
Burchard, moderately eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
59E2:							
Burchard, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
99C2:							
Exira, moderately eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
99D2:							
Exira, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
99E2:							
Exira, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
100B:							
Monona	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
100C2:							
Monona, moderately eroded	50	Not limited		Not limited		Somewhat limited	
						Slope	0.88
100D2:							
Monona, moderately eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
100D3:							
Monona, severely eroded	45	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
100E2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100E3:							
Monona, severely eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
100F2:							
Monona, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50			Shrink-swell	0.50
111D3:							
Dow, severely eroded	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Monona, severely eroded	40	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Monona, severely eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
125D3:							
Ida, severely eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
Chute, severely eroded	30	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
133:							
Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
133+:							
Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
212:							
Kennebec, occasionally flooded	70	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
212+:							
Kennebec, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
220:							
Nodaway, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
266:							
Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
266+:							
Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
268D:							
Knox	85	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
268E:							
Knox	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
268F:							
Knox	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
431B:							
Judson	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
Ackmore, frequently flooded	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	1.00	Shrink-swell	0.50
Colo, overwash, frequently flooded	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
509B:							
Marshall, terrace	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
509C:							
Marshall, terrace	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
509C2:							
Marshall, terrace, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
509D2:							
Marshall, terrace, moderately eroded	65	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
509E2:							
Marshall, terrace, moderately eroded--	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
510:							
Monona, terrace-----	100	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
510B:							
Monona, terrace-----	60	Somewhat limited		Not limited		Somewhat limited	
		Shrink-swell	0.50			Shrink-swell	0.50
510C2:							
Monona, terrace, moderately eroded--	75	Not limited		Not limited		Somewhat limited	
						Slope	0.88
510D2:							
Monona, terrace, moderately eroded--	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
630:							
Danbury, occasionally flooded----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	1.00	Shrink-swell	0.50
		Depth to saturated zone	0.39	Shrink-swell	1.00	Depth to saturated zone	0.39
670:							
Rawles, occasionally flooded----------	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
700:							
Monona, terrace-----	100	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
700B:							
Monona, terrace-----	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
700C2:							
Monona, terrace, moderately eroded--	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
700D2:							
Monona, terrace, moderately eroded--	60	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
		Shrink-swell	0.50	Shrink-swell	0.50	Shrink-swell	0.50
717D:							
Napier----------	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.04	Slope	0.04	Slope	1.00
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick----------	90	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.63	Slope	0.63	Slope	1.00
740E:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
740F:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
980C:							
Judson----------	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Shrink-swell	0.50	Shrink-swell	0.50	Slope	0.88
						Shrink-swell	0.50
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
		Shrink-swell	0.50	Depth to saturated zone	0.61	Shrink-swell	0.50
				Shrink-swell	0.50		
5010:							
Pits, sand and gravel----------	100	Not rated		Not rated		Not rated	
5040:							
Udorthents----------	100	Not rated		Not rated		Not rated	
5080:							
Udorthents----------	100	Not rated		Not rated		Not rated	

Dwellings and Small Commercial Buildings--Continued

Map symbol and soil name	Pct. of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon-------	100	Not rated		Not rated		Not rated	
W:							
Water---------------	100	Not rated		Not rated		Not rated	

Roads and Streets, Shallow Excavations, and Lawns and Landscaping

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
1C3:							
Ida, severely eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
1D3:							
Ida, severely eroded	80	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
1E3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
1F3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
8B:							
Judson	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
8C:							
Judson	95	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9:							
Marshall	95	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9B:							
Marshall	100	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9B2:							
Marshall, moderately eroded	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9C:							
Marshall	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9C2:							
Marshall, moderately eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9D:							
Marshall	85	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
9D2:							
Marshall, moderately eroded	70	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.63				
9E2:							
Marshall, moderately eroded	70	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				
9E3:							
Marshall, severely eroded	75	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				
10B:							
Monona	100	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
10B2:							
Monona, moderately eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
10C2:							
Monona, moderately eroded	75	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
10D2:							
Monona, moderately eroded	60	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D3:							
Monona, severely eroded	95	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
10E2:							
Monona, moderately eroded	50	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
10E3:							
Monona, severely eroded	60	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
10F2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
10F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
12B:							
Napier	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
12C:							
Napier	95	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
17B:							
Napier	50	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
Kennebec, frequently flooded	20	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Flooding	0.80	Flooding	1.00
		Flooding	1.00	Depth to saturated zone	0.61		
		Shrink-swell	0.50	Cutbanks cave	0.10		
Nodaway, frequently flooded	15	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Flooding	0.80	Flooding	1.00
		Flooding	1.00	Depth to saturated zone	0.61		
		Low strength	1.00	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22D2:							
Dow, moderately eroded	90	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
22D3:							
Dow, severely eroded	90	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
22E3:							
Dow, severely eroded	80	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
26:							
Kennebec, occasionally flooded	95	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
				Cutbanks cave	0.10		
35D2:							
Liston, moderately eroded	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Burchard, moderately eroded	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
35E2:							
Liston, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Burchard, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
35F2:							
Liston, moderately eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35F2:							
Burchard, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
35G:							
Liston	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
Burchard	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
54+:							
Zook, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
59D2:							
Burchard, moderately eroded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
59E2:							
Burchard, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Shrink-swell	0.50	Cutbanks cave	0.10		
		Frost action	0.50				
99C2:							
Exira, moderately eroded	80	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99D2:							
Exira, moderately eroded	50	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.63				
99E2:							
Exira, moderately eroded	45	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				
100B:							
Monona	75	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
100C2:							
Monona, moderately eroded	50	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
100D2:							
Monona, moderately eroded	45	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.63				
100D3:							
Monona, severely eroded	45	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.63				
100E2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				
100E3:							
Monona, severely eroded	45	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100F2:							
Monona, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
100F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
111D3:							
Dow, severely eroded	55	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
Monona, severely eroded	40	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
Monona, severely eroded	40	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
125D3:							
Ida, severely eroded	50	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
Chute, severely eroded	30	Somewhat limited		Very limited		Somewhat limited	
		Slope	0.63	Cutbanks cave	1.00	Slope	0.63
				Slope	0.63	Droughty	0.22
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	0.22

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
133: Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
133+: Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
212: Kennebec, occasionally flooded	70	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Cutbanks cave	0.10		
212+: Kennebec, overwash, occasionally flooded	90	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Shrink-swell	0.50	Cutbanks cave	0.10		
220: Nodaway, occasionally flooded	75	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to saturated zone	0.61	Flooding	0.60
		Flooding	1.00	Flooding	0.60		
		Low strength	1.00	Cutbanks cave	0.10		
266: Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
266+:							
Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
268D:							
Knox	85	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
268E:							
Knox	80	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
268F:							
Knox	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Frost action	1.00	Flooding	0.60	Flooding	0.60
		Flooding	1.00	Cutbanks cave	0.10		
431B:							
Judson	55	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
Ackmore, frequently flooded	25	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10		
Colo, overwash, frequently flooded	15	Very limited		Very limited		Very limited	
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Flooding	1.00
		Frost action	1.00	Flooding	0.80	Depth to saturated zone	1.00
		Flooding	1.00	Cutbanks cave	0.10		
509B:							
Marshall, terrace	90	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
509C:							
Marshall, terrace---	85	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
509C2:							
Marshall, terrace, moderately eroded--	65	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Low strength	1.00				
		Shrink-swell	0.50				
509D2:							
Marshall, terrace, moderately eroded--	65	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	0.63				
509E2:							
Marshall, terrace, moderately eroded--	65	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Low strength	1.00	Cutbanks cave	0.10		
		Slope	1.00				
510:							
Monona, terrace-----	100	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
510B:							
Monona, terrace-----	60	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
510C2:							
Monona, terrace, moderately eroded--	75	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
510D2:							
Monona, terrace, moderately eroded--	75	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Very limited		Very limited	
		Frost action	1.00	Slope	1.00	Slope	1.00
		Slope	1.00	Cutbanks cave	0.10		

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
630:							
Danbury, occasionally flooded	80	Very limited		Very limited		Somewhat limited	
		Frost action	1.00	Depth to	1.00	Flooding	0.60
		Flooding	1.00	saturated zone		Depth to	0.19
		Shrink-swell	0.50	Flooding	0.60	saturated zone	
				Cutbanks cave	0.10		
670:							
Rawles, occasionally flooded	80	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Depth to	0.61	Flooding	0.60
		Flooding	1.00	saturated zone			
		Shrink-swell	0.50	Flooding	0.60		
				Cutbanks cave	0.10		
700:							
Monona, terrace	100	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
700B:							
Monona, terrace	75	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
700C2:							
Monona, terrace, moderately eroded	50	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
700D2:							
Monona, terrace, moderately eroded	60	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Slope	0.63	Slope	0.63
		Slope	0.63	Cutbanks cave	0.10		
		Shrink-swell	0.50				
717D:							
Napier	50	Very limited		Somewhat limited		Somewhat limited	
		Frost action	1.00	Cutbanks cave	0.10	Slope	0.04
		Slope	0.04	Slope	0.04		
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick	90	Somewhat limited		Very limited		Very limited	
		Slope	0.63	Cutbanks cave	1.00	Droughty	0.99
				Slope	0.63	Slope	0.63
740E:							
Hawick	90	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	0.99

Roads and Streets, Shallow Excavations, and Lawns and Landscaping--Continued

Map symbol and soil name	Pct. of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
740F:							
Hawick	90	Very limited		Very limited		Very limited	
		Slope	1.00	Cutbanks cave	1.00	Slope	1.00
				Slope	1.00	Droughty	0.99
980C:							
Judson	55	Very limited		Somewhat limited		Not limited	
		Frost action	1.00	Cutbanks cave	0.10		
		Shrink-swell	0.50				
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Very limited		Somewhat limited		Very limited	
		Frost action	1.00	Flooding	0.80	Flooding	1.00
		Flooding	1.00	Depth to saturated zone	0.61		
		Low strength	1.00	Cutbanks cave	0.10		
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Sanitary Facilities

The titles of the tables described in this section are:

- "Sewage Disposal"
- "Landfills"

These tables show the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, sanitary landfills, and daily cover for landfill. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the tables indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 60 inches is evaluated. The ratings are based on the soil properties that affect absorption of the effluent, construction and maintenance of the system, and public health. Permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, and flooding affect absorption of the effluent. Stones and boulders, ice, and bedrock or a cemented pan interfere with installation. Subsidence interferes with installation and maintenance. Excessive slope may cause lateral seepage and surfacing of the effluent in downslope areas.

Some soils are underlain by loose sand and gravel or fractured bedrock at a depth of less than 4 feet below the distribution lines. In these soils the absorption field may not adequately filter the effluent, particularly when the system is new. As a result, the ground water may become contaminated.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water. Considered in the ratings are slope, permeability, depth to a water table, ponding, depth to bedrock or a cemented pan, flooding, large stones, and content of organic matter.

Soil permeability is a critical property affecting the suitability for sewage lagoons. Most porous soils eventually become sealed when they are used as sites for sewage lagoons. Until sealing occurs, however, the hazard of pollution is severe. Soils that have a permeability rate of more than 2 inches per hour are too porous for the proper functioning of sewage lagoons. In these soils, seepage of the effluent can result in contamination of the ground water. Ground-water contamination is also a hazard if fractured bedrock is within a depth of 40 inches, if the water table is high enough to raise the level of sewage in the lagoon, or if floodwater overtops the lagoon.

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If

the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

A *trench sanitary landfill* is an area where solid waste is placed in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil excavated at the site. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. The ratings in the table are based on the soil properties that affect the risk of pollution, the ease of excavation, trafficability, and revegetation. These properties include permeability, depth to bedrock or a cemented pan, depth to a water table, ponding, slope, flooding, texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, onsite investigation may be needed.

Hard, nonrippable bedrock, creviced bedrock, or highly permeable strata in or directly below the proposed trench bottom can affect the ease of excavation and the hazard of ground-water pollution. Slope affects construction of the trenches and the movement of surface water around the landfill. It also affects the construction and performance of roads in areas of the landfill.

Soil texture and consistence affect the ease with which the trench is dug and the ease with which the soil can be used as daily or final cover. They determine the workability of the soil when dry and when wet. Soils that are plastic and sticky when wet are difficult to excavate, grade, or compact and are difficult to place as a uniformly thick cover over a layer of refuse.

The soil material used as the final cover for a trench landfill should be suitable for plants. It should not have excess sodium or salts and should not be too acid. The surface layer generally has the best workability, the highest content of organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

In an *area sanitary landfill*, solid waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site. A final cover of soil material at least 2 feet thick is placed over the completed landfill. The ratings in the table are based on the soil properties that affect trafficability and the risk of pollution. These properties include flooding, permeability, depth to a water table, ponding, slope, and depth to bedrock or a cemented pan.

Flooding is a serious problem because it can result in pollution in areas downstream from the landfill. If permeability is too rapid or if fractured bedrock, a fractured cemented pan, or the water table is close to the surface, the leachate can contaminate the water supply. Slope is a consideration because of the extra grading required to maintain roads in the steeper areas of the landfill. Also, leachate may flow along the surface of the soils in the steeper areas and cause difficult seepage problems.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste. The ratings in the table also apply to the final cover for a landfill. They are based on the soil properties that affect workability, the ease of digging, and the ease of moving and spreading the material over the refuse daily during wet and dry periods. These properties include soil texture, depth to a water table, ponding, rock fragments, slope, depth to bedrock or a cemented pan, reaction, and content of salts, sodium, or lime.

Loamy or silty soils that are free of large stones and excess gravel are the best cover for a landfill. Clayey soils may be sticky and difficult to spread; sandy soils are subject to wind erosion.

Slope affects the ease of excavation and of moving the cover material. Also, it can influence runoff, erosion, and reclamation of the borrow area.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as the final cover for a landfill should be suitable for plants. It should not have excess sodium, salts, or lime and should not be too acid.

Sewage Disposal

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
1C:					
Ida	95	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
1C3:					
Ida, severely eroded	80	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
1D3:					
Ida, severely eroded	80	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
1E3:					
Ida, severely eroded	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
1F3:					
Ida, severely eroded	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
8B:					
Judson	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
8C:					
Judson	95	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
9:					
Marshall	95	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
9B:					
Marshall	100	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
9B2:					
Marshall, moderately eroded	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
9C:					
Marshall	90	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
9C2:					
Marshall, moderately eroded	80	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
9D:					
Marshall	85	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
9D2:					
Marshall, moderately eroded	70	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
9E2:					
Marshall, moderately eroded	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
9E3:					
Marshall, severely eroded	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10B:					
Monona	100	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
10B2:					
Monona, moderately eroded	80	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
10C2:					
Monona, moderately eroded	75	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
10D2:					
Monona, moderately eroded	60	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10D3:					
Monona, severely eroded	95	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10E2:					
Monona, moderately eroded	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10E3:					
Monona, severely eroded	60	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10F2:					
Monona, moderately eroded	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
10F3:					
Monona, severely eroded	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
12B:					
Napier	85	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
12C:					
Napier	95	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
17B:					
Napier	50	Somewhat limited Slow water movement	0.46	Somewhat limited Seepage Slope	0.53 0.32
Kennebec, frequently flooded	20	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.46	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.53
Nodaway, frequently flooded	15	Very limited Flooding Depth to saturated zone Slow water movement	1.00 0.99 0.50	Very limited Flooding Depth to saturated zone Seepage	1.00 0.71 0.50
22D2:					
Dow, moderately eroded	90	Somewhat limited Slope Slow water movement	0.63 0.46	Very limited Slope Seepage	1.00 0.53
22D3:					
Dow, severely eroded	90	Somewhat limited Slope Slow water movement	0.63 0.46	Very limited Slope Seepage	1.00 0.53
22E3:					
Dow, severely eroded	80	Very limited Slope Slow water movement	1.00 0.46	Very limited Slope Seepage	1.00 0.53
26:					
Kennebec, occasionally flooded	95	Very limited Flooding Seepage, bottom layer Depth to saturated zone	1.00 1.00 0.99	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 0.71
35D2:					
Liston, moderately eroded	50	Very limited Slow water movement Slope	1.00 0.63	Very limited Slope	1.00

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
35D2:					
Burchard, moderately eroded	35	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
35E2:					
Liston, moderately eroded	50	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
Burchard, moderately eroded	35	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
35F2:					
Liston, moderately eroded	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
Burchard, moderately eroded	30	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
35G:					
Liston	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
Burchard	35	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	1.00		
54:					
Zook, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
54+:					
Zook, overwash, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
59D2:					
Burchard, moderately eroded	55	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	0.63		
59E2:					
Burchard, moderately eroded	55	Very limited		Very limited	
		Slow water movement	1.00	Slope	1.00
		Slope	1.00		
99C2:					
Exira, moderately eroded	80	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
99D2:					
Exira, moderately eroded	50	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
99E2:					
Exira, moderately eroded	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
100B:					
Monona	75	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
100C2:					
Monona, moderately eroded	50	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
100D2:					
Monona, moderately eroded	45	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
100D3:					
Monona, severely eroded	45	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
100E2:					
Monona, moderately eroded	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
100E3:					
Monona, severely eroded	45	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.50	Seepage	0.50
100F2:					
Monona, moderately eroded	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
100F3:					
Monona, severely eroded	70	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
111D3:					
Dow, severely eroded	55	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
Monona, severely eroded	40	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
111E3:					
Dow, severely eroded	55	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
111E3:					
Monona, severely eroded	40	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
125D3:					
Ida, severely eroded	50	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
Chute, severely eroded	30	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	0.63		
125E3:					
Ida, severely eroded	50	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
Chute, severely eroded	30	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00
		Slope	1.00		
133:					
Colo, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
133+:					
Colo, overwash, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
212:					
Kennebec, occasionally flooded	70	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.46	Seepage	0.53
212+:					
Kennebec, overwash, occasionally flooded	90	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.46	Seepage	0.53
220:					
Nodaway, occasionally flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage	0.50
266:					
Smithland, occasionally flooded	85	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
266+:					
Smithland, overwash, occasionally flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
268D:					
Knox	85	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
268E:					
Knox	80	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
268F:					
Knox	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
430:					
Ackmore, occasionally flooded	75	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53
431B:					
Judson	55	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
Ackmore, frequently flooded	25	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
Colo, overwash, frequently flooded	15	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	0.46	Seepage	0.53
509B:					
Marshall, terrace	90	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
509C:					
Marshall, terrace	85	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
509C2:					
Marshall, terrace, moderately eroded	65	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
509D2:					
Marshall, terrace, moderately eroded--	65	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
509E2:					
Marshall, terrace, moderately eroded--	65	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
510:					
Monona, terrace-----	100	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
510B:					
Monona, terrace-----	60	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.08
510C2:					
Monona, terrace, moderately eroded--	75	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
510D2:					
Monona, terrace, moderately eroded--	75	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
510E2:					
Monona, terrace, moderately eroded--	75	Very limited		Very limited	
		Slope	1.00	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
630:					
Danbury, occasionally flooded----------	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Slow water movement	1.00	Seepage	0.53

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
670:					
Rawles, occasionally flooded	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.46	Seepage	0.53
700:					
Monona, terrace	100	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
700B:					
Monona, terrace	75	Somewhat limited		Somewhat limited	
		Slow water movement	0.46	Seepage	0.53
				Slope	0.32
700C2:					
Monona, terrace, moderately eroded	50	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
700D2:					
Monona, terrace, moderately eroded	60	Somewhat limited		Very limited	
		Slope	0.63	Slope	1.00
		Slow water movement	0.46	Seepage	0.53
717D:					
Napier	50	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
		Slope	0.04		
Gullied land, frequently flooded	35	Not rated		Not rated	
740D:					
Hawick	90	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
				Seepage	1.00
		Seepage, bottom layer	1.00		
		Slope	0.63		
740E:					
Hawick	90	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
				Seepage	1.00
		Seepage, bottom layer	1.00		
		Slope	1.00		

Sewage Disposal--Continued

Map symbol and soil name	Pct. of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
740F:					
Hawick	90	Very limited		Very limited	
		Filtering capacity	1.00	Slope	1.00
		Slope	1.00	Seepage	1.00
		Seepage, bottom layer	1.00		
980C:					
Judson	55	Somewhat limited		Very limited	
		Slow water movement	0.46	Slope	1.00
				Seepage	0.53
Gullied land, frequently flooded	35	Not rated		Not rated	
1220:					
Nodaway, channeled, frequently flooded	80	Very limited		Very limited	
		Flooding	1.00	Flooding	1.00
		Depth to saturated zone	0.99	Depth to saturated zone	0.71
		Slow water movement	0.50	Seepage	0.50
5010:					
Pits, sand and gravel	100	Not rated		Not rated	
5040:					
Udorthents	100	Not rated		Not rated	
5080:					
Udorthents	100	Not rated		Not rated	
AW:					
Animal waste lagoon	100	Not rated		Not rated	
SL:					
Sewage lagoon	100	Not rated		Not rated	
W:					
Water	100	Not rated		Not rated	

Landfills

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Not limited		Not limited		Not limited	
1C3:							
Ida, severely eroded	80	Not limited		Not limited		Not limited	
1D3:							
Ida, severely eroded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
1E3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
1F3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
8B:							
Judson	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
8C:							
Judson	95	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9:							
Marshall	95	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9B:							
Marshall	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9B2:							
Marshall, moderately eroded	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9C:							
Marshall	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
9D:							
Marshall	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9D2:							
Marshall, moderately eroded	70	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
9E2:							
Marshall, moderately eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
9E3:							
Marshall, severely eroded	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
10B:							
Monona	100	Not limited		Not limited		Not limited	
10B2:							
Monona, moderately eroded	80	Not limited		Not limited		Not limited	
10C2:							
Monona, moderately eroded	75	Not limited		Not limited		Not limited	
10D2:							
Monona, moderately eroded	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
10D3:							
Monona, severely eroded	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
10E2:							
Monona, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
10E3:							
Monona, severely eroded	60	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
10F2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
10F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12B:							
Napier	85	Not limited		Not limited		Not limited	
12C:							
Napier	95	Not limited		Not limited		Not limited	
17B:							
Napier	50	Not limited		Not limited		Not limited	
Kennebec, frequently flooded	20	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
Nodaway, frequently flooded	15	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
22D2:							
Dow, moderately eroded	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
22D3:							
Dow, severely eroded	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
22E3:							
Dow, severely eroded	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
26:							
Kennebec, occasionally flooded	95	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Seepage, bottom layer	1.00				
35D2:							
Liston, moderately eroded	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
Burchard, moderately eroded	35	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35E2:							
Liston, moderately eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Burchard, moderately eroded	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
35F2:							
Liston, moderately eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Burchard, moderately eroded	30	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
35G:							
Liston	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
Burchard	35	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
54:							
Zook, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
54+:							
Zook, overwash, occasionally flooded	90	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	1.00
		Too clayey	1.00			Hard to compact	1.00
59D2:							
Burchard, moderately eroded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
59E2:							
Burchard, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
99C2:							
Exira, moderately eroded	80	Not limited		Not limited		Somewhat limited	
						Too clayey	0.50
99D2:							
Exira, moderately eroded	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
						Too clayey	0.50
99E2:							
Exira, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
						Too clayey	0.50
100B:							
Monona	75	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
100C2:							
Monona, moderately eroded	50	Not limited		Not limited		Not limited	
100D2:							
Monona, moderately eroded	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
100D3:							
Monona, severely eroded	45	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
100E2:							
Monona, moderately eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100E3:							
Monona, severely eroded	45	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100F2:							
Monona, moderately eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
100F3:							
Monona, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
111D3:							
Dow, severely eroded	55	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111D3:							
Monona, severely eroded	40	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Monona, severely eroded	40	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
125D3:							
Ida, severely eroded	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
				Slope	0.63	Seepage	1.00
		Too sandy	1.00			Slope	0.63
		Slope	0.63				
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
Chute, severely eroded	30	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
				Slope	1.00	Seepage	1.00
		Too sandy	1.00			Slope	1.00
		Slope	1.00				
133:							
Colo, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
133+:							
Colo, overwash, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
212:							
Kennebec, occasionally flooded	70	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
212+:							
Kennebec, overwash, occasionally flooded	90	Very limited		Very limited		Not limited	
		Flooding	1.00	Flooding	1.00		
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
220:							
Nodaway, occasionally flooded	75	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
266:							
Smithland, occasionally flooded	85	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
266+:							
Smithland, overwash, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
268D:							
Knox	85	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
268E:							
Knox	80	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
268F:							
Knox	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
430:							
Ackmore, occasionally flooded	75	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
431B:							
Judson	55	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Ackmore, frequently flooded	25	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
Colo, overwash, frequently flooded	15	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
509B:							
Marshall, terrace	90	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
509C:							
Marshall, terrace	85	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
509C2:							
Marshall, terrace, moderately eroded	65	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
509D2:							
Marshall, terrace, moderately eroded	65	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
509E2:							
Marshall, terrace, moderately eroded	65	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Too clayey	0.50			Too clayey	0.50
510:							
Monona, terrace	100	Not limited		Not limited		Not limited	
510B:							
Monona, terrace	60	Not limited		Not limited		Not limited	
510C2:							
Monona, terrace, moderately eroded	75	Not limited		Not limited		Not limited	
510D2:							
Monona, terrace, moderately eroded	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
630:							
Danbury, occasionally flooded----------	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Depth to saturated zone	0.86
		Depth to saturated zone	1.00	Depth to saturated zone	1.00	Too clayey	0.50
		Too clayey	0.50				
670:							
Rawles, occasionally flooded----------	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
700:							
Monona, terrace-----	100	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
700B:							
Monona, terrace-----	75	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
700C2:							
Monona, terrace, moderately eroded--	50	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
700D2:							
Monona, terrace, moderately eroded--	60	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.63	Slope	0.63	Slope	0.63
		Too clayey	0.50			Too clayey	0.50
717D:							
Napier----------	50	Somewhat limited		Somewhat limited		Somewhat limited	
		Slope	0.04	Slope	0.04	Slope	0.04
Gullied land, frequently flooded	35	Not rated		Very limited		Not rated	
				Flooding	1.00		
				Slope	0.04		
740D:							
Hawick----------	90	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
		Too sandy	1.00	Slope	0.63	Seepage	1.00
		Slope	0.63			Slope	0.63

Landfills--Continued

Map symbol and soil name	Pct. of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
740E:							
Hawick	90	Very limited		Very limited		Very limited	
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
				Slope	1.00	Seepage	1.00
		Too sandy	1.00			Slope	1.00
		Slope	1.00				
740F:							
Hawick	90	Very limited		Very limited		Very limited	
		Slope	1.00	Slope	1.00	Slope	1.00
		Seepage, bottom layer	1.00	Seepage	1.00	Too sandy	1.00
						Seepage	1.00
		Too sandy	1.00				
980C:							
Judson	55	Somewhat limited		Not limited		Somewhat limited	
		Too clayey	0.50			Too clayey	0.50
Gullied land, frequently flooded	35	Not rated		Very limited		Not rated	
				Flooding	1.00		
1220:							
Nodaway, channeled, frequently flooded	80	Very limited		Very limited		Somewhat limited	
		Flooding	1.00	Flooding	1.00	Too clayey	0.50
		Depth to saturated zone	1.00	Depth to saturated zone	1.00		
		Too clayey	0.50				
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Construction Materials

The titles of the tables described in this section are:

- "Source of Sand and Gravel"
- "Source of Reclamation Material, Roadfill, and Topsoil"

These tables give information about the soils as potential sources of gravel, sand, reclamation material, roadfill, and topsoil. Normal compaction, minor processing, and other standard construction practices are assumed.

Gravel and *sand* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table "Source of Sand and Gravel," only the likelihood of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand or gravel, the soil is considered a likely source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

The soils are rated as *improbable, possible, probable,* or *very likely* sources of gravel. The bottom layer and the thickest layer of the soils are assigned numerical ratings. These ratings indicate the likelihood that the layer is a source of gravel. The number 0.00 indicates an improbable source; 0.01 to 0.39, a possible source; 0.40 to 0.99, a probable source; and 1.00, a very likely source.

The soils are rated *good, fair,* or *poor* as potential sources of sand. A rating of good or fair means that the source material is likely to be in or below the soil. The bottom layer and the thickest layer of the soils are assigned numerical ratings. The larger the number, the greater the likelihood that the layer is a source of sand.

In the table "Source of Reclamation Material, Roadfill, and Topsoil," the rating class terms are *good, fair,* and *poor*. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of reclamation material, roadfill, and topsoil. The lower the number, the greater the limitation.

Reclamation material is used in areas that have been drastically disturbed by surface mining or similar activities. When these areas are reclaimed, layers of soil material or unconsolidated geological material, or both, are replaced in a vertical sequence. The reconstructed soil favors plant growth. The ratings in the table do not apply to quarries and other mined areas that require an offsite source of reconstruction material. The ratings are based on the soil properties that affect erosion and stability of the surface and the productive potential of the reconstructed soil. These properties include the content of sodium, salts, and calcium carbonate; reaction; available water capacity; erodibility; texture; content of rock fragments; and content of organic matter and other features that affect fertility.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation

is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Source of Sand and Gravel

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The ratings given for the thickest layer are for the thickest layer above and excluding the bottom layer. The numbers in the value columns range from 0.00 to 0.99. The greater the value, the greater the likelihood that the bottom layer or thickest layer of the soil is a source of sand or gravel. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
1C:					
Ida	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1C3:					
Ida, severely eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1D3:					
Ida, severely eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1E3:					
Ida, severely eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
1F3:					
Ida, severely eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
8B:					
Judson	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
8C:					
Judson	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9:					
Marshall	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9B:					
Marshall	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9B2:					
Marshall, moderately eroded	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
9C:					
Marshall	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9C2:					
Marshall, moderately eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9D:					
Marshall	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9D2:					
Marshall, moderately eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9E2:					
Marshall, moderately eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
9E3:					
Marshall, severely eroded	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10B:					
Monona	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10B2:					
Monona, moderately eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10C2:					
Monona, moderately eroded	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10D2:					
Monona, moderately eroded	60	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
10D3:					
Monona, severely eroded	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10E2:					
Monona, moderately eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10E3:					
Monona, severely eroded	60	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10F2:					
Monona, moderately eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
10F3:					
Monona, severely eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
12B:					
Napier	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
12C:					
Napier	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
17B:					
Napier	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Kennebec, frequently flooded	20	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Nodaway, frequently flooded	15	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
22D2:					
Dow, moderately eroded	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
22D3:					
Dow, severely eroded	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
22E3:					
Dow, severely eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
26:					
Kennebec, occasionally flooded	95	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
35D2:					
Liston, moderately eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Burchard, moderately eroded	35	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
35E2:					
Liston, moderately eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Burchard, moderately eroded	35	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
35F2:					
Liston, moderately eroded	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Burchard, moderately eroded	30	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
35G:					
Liston	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Burchard	35	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
54:					
Zook, occasionally flooded	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
54+:					
Zook, overwash, occasionally flooded	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
59D2:					
Burchard, moderately eroded	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
59E2:					
Burchard, moderately eroded	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
99C2:					
Exira, moderately eroded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
99D2:					
Exira, moderately eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
99E2:					
Exira, moderately eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100B:					
Monona	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100C2:					
Monona, moderately eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100D2:					
Monona, moderately eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
100D3:					
Monona, severely eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100E2:					
Monona, moderately eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100E3:					
Monona, severely eroded	45	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100F2:					
Monona, moderately eroded	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
100F3:					
Monona, severely eroded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
111D3:					
Dow, severely eroded	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Monona, severely eroded	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
111E3:					
Dow, severely eroded	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Monona, severely eroded	40	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
125D3:					
Ida, severely eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Chute, severely eroded	30	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.06
		Bottom layer	0.00	Bottom layer	0.26

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
125E3:					
Ida, severely eroded	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Chute, severely eroded	30	Improbable		Fair	
		Thickest layer	0.00	Thickest layer	0.06
		Bottom layer	0.00	Bottom layer	0.26
133:					
Colo, occasionally flooded	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
133+:					
Colo, overwash, occasionally flooded	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
212:					
Kennebec, occasionally flooded	70	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
212+:					
Kennebec, overwash, occasionally flooded	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
220:					
Nodaway, occasionally flooded	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
266:					
Smithland, occasionally flooded	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
266+:					
Smithland, overwash, occasionally flooded	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
268D:					
Knox	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
268E:					
Knox	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
268F:					
Knox	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
430:					
Ackmore, occasionally flooded	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
431B:					
Judson	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Ackmore, frequently flooded	25	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Colo, overwash, frequently flooded	15	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
509B:					
Marshall, terrace	90	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
509C:					
Marshall, terrace	85	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
509C2:					
Marshall, terrace, moderately eroded	65	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
509D2:					
Marshall, terrace, moderately eroded	65	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
509E2:					
Marshall, terrace, moderately eroded--	65	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
510:					
Monona, terrace-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
510B:					
Monona, terrace-----	60	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
510C2:					
Monona, terrace, moderately eroded--	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
510D2:					
Monona, terrace, moderately eroded--	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
510E2:					
Monona, terrace, moderately eroded--	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
630:					
Danbury, occasionally flooded----------	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
670:					
Rawles, occasionally flooded----------	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
700:					
Monona, terrace-----	100	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
700B:					
Monona, terrace-----	75	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
700C2:					
Monona, terrace, moderately eroded--	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
700D2:					
Monona, terrace, moderately eroded--	60	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
717D:					
Napier----------	50	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Gullied land, frequently flooded	35	Not rated		Not rated	
740D:					
Hawick----------	90	Possible		Fair	
		Thickest layer	0.00	Thickest layer	0.12
		Bottom layer	0.04	Bottom layer	0.88
740E:					
Hawick----------	90	Possible		Fair	
		Thickest layer	0.00	Thickest layer	0.12
		Bottom layer	0.04	Bottom layer	0.88
740F:					
Hawick----------	90	Possible		Fair	
		Thickest layer	0.00	Thickest layer	0.12
		Bottom layer	0.04	Bottom layer	0.88
980C:					
Judson----------	55	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
Gullied land, frequently flooded	35	Not rated		Not rated	
1220:					
Nodaway, channeled, frequently flooded	80	Improbable		Poor	
		Thickest layer	0.00	Bottom layer	0.00
		Bottom layer	0.00	Thickest layer	0.00
5010:					
Pits, sand and gravel----------	100	Not rated		Not rated	
5040:					
Udorthents----------	100	Not rated		Not rated	
5080:					
Udorthents----------	100	Not rated		Not rated	

Source of Sand and Gravel--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of gravel		Potential as source of sand	
		Rating class	Value	Rating class	Value
AW:					
Animal waste lagoon	100	Not rated		Not rated	
SL:					
Sewage lagoon-------	100	Not rated		Not rated	
W:					
Water----------	100	Not rated		Not rated	

Source of Reclamation Material, Roadfill, and Topsoil

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 0.99. The smaller the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Fair		Poor		Fair	
		Organic matter content	0.12	Low strength	0.00	Carbonate content	0.99
		Water erosion	0.90				
		Carbonate content	0.97				
1C3:							
Ida, severely eroded	80	Fair		Good		Good	
		Organic matter content	0.12				
		Water erosion	0.90				
		Carbonate content	0.97				
1D3:							
Ida, severely eroded	80	Fair		Good		Fair	
		Organic matter content	0.12			Slope	0.37
		Water erosion	0.90				
		Carbonate content	0.97				
1E3:							
Ida, severely eroded	70	Fair		Fair		Poor	
		Organic matter content	0.12	Slope	0.92	Slope	0.00
		Water erosion	0.90				
		Carbonate content	0.97				
1F3:							
Ida, severely eroded	70	Fair		Poor		Poor	
		Organic matter content	0.12	Slope	0.00	Slope	0.00
		Water erosion	0.90				
		Carbonate content	0.97				
8B:							
Judson	80	Fair		Fair		Fair	
		Too clayey	0.88	Shrink-swell	0.87	Too clayey	0.88
		Water erosion	0.90				
8C:							
Judson	95	Fair		Fair		Fair	
		Too clayey	0.88	Shrink-swell	0.87	Too clayey	0.88
		Water erosion	0.90				
9:							
Marshall	95	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Too clayey	0.65
		Water erosion	0.90				
		Too clayey	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9B:							
Marshall	100	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Too clayey	0.65
		Water erosion	0.90				
		Too clayey	0.99				
9B2:							
Marshall, moderately eroded	85	Fair		Fair		Fair	
		Too clayey	0.99	Shrink-swell	0.87	Too clayey	0.77
9C:							
Marshall	90	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Too clayey	0.65
		Water erosion	0.90				
		Too clayey	0.99				
9C2:							
Marshall, moderately eroded	80	Fair		Fair		Fair	
		Too clayey	0.99	Shrink-swell	0.87	Too clayey	0.77
9D:							
Marshall	85	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Slope	0.37
		Water erosion	0.90			Too clayey	0.65
		Too clayey	0.99				
9D2:							
Marshall, moderately eroded	70	Fair		Poor		Fair	
		Too clayey	0.99	Low strength	0.00	Slope	0.37
				Shrink-swell	0.87	Too clayey	0.77
9E2:							
Marshall, moderately eroded	70	Fair		Poor		Poor	
		Too clayey	0.99	Low strength	0.00	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.77
				Slope	0.98		
9E3:							
Marshall, severely eroded	75	Fair		Poor		Poor	
		Too clayey	0.99	Low strength	0.00	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.77
				Slope	0.98		
10B:							
Monona	100	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10B2:							
Monona, moderately eroded	80	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				
10C2:							
Monona, moderately eroded	75	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				
10D2:							
Monona, moderately eroded	60	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				
10D3:							
Monona, severely eroded	95	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				
10E2:							
Monona, moderately eroded	50	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Water erosion	0.90				
10E3:							
Monona, severely eroded	60	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Water erosion	0.90				
10F2:							
Monona, moderately eroded	45	Fair		Poor		Poor	
		Organic matter content	0.50	Slope	0.00	Slope	0.00
		Water erosion	0.90				
10F3:							
Monona, severely eroded	70	Fair		Poor		Poor	
		Organic matter content	0.50	Slope	0.00	Slope	0.00
		Water erosion	0.90				
12B:							
Napier	85	Fair		Good		Good	
		Water erosion	0.90				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
12C:							
Napier	95	Fair Water erosion	 0.90	Good		Good	
17B:							
Napier	50	Fair Water erosion	 0.90	Good		Good	
Kennebec, frequently flooded	20	Good		Fair Shrink-swell	 0.87	Good	
Nodaway, frequently flooded	15	Fair Organic matter content Water erosion	 0.12 0.90	Poor Low strength Shrink-swell	 0.00 0.87	Good	
22D2:							
Dow, moderately eroded	90	Fair Organic matter content Carbonate content Water erosion	 0.50 0.80 0.90	Good		Fair Slope	 0.37
22D3:							
Dow, severely eroded	90	Fair Organic matter content Carbonate content Water erosion	 0.50 0.80 0.90	Good		Fair Slope	 0.37
22E3:							
Dow, severely eroded	80	Fair Organic matter content Carbonate content Water erosion	 0.50 0.80 0.90	Fair Slope	 0.92	Poor Slope	 0.00
26:							
Kennebec, occasionally flooded	95	Fair Too acid	 0.99	Good		Good	
35D2:							
Liston, moderately eroded	50	Good		Fair Shrink-swell	 0.87	Fair Slope	 0.37
Burchard, moderately eroded	35	Fair Organic matter content Water erosion	 0.12 0.99	Fair Shrink-swell	 0.87	Fair Slope	 0.37

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35E2:							
Liston, moderately eroded	50	Good		Fair		Poor	
				Shrink-swell	0.87	Slope	0.00
				Slope	0.98		
Burchard, moderately eroded	35	Fair		Fair		Poor	
		Organic matter content	0.12	Shrink-swell	0.87	Slope	0.00
				Slope	0.98		
		Water erosion	0.99				
35F2:							
Liston, moderately eroded	40	Good		Fair		Poor	
				Slope	0.32	Slope	0.00
				Shrink-swell	0.87		
Burchard, moderately eroded	30	Fair		Fair		Poor	
		Organic matter content	0.12	Slope	0.32	Slope	0.00
				Shrink-swell	0.87		
		Water erosion	0.99				
35G:							
Liston	45	Good		Poor		Poor	
				Slope	0.00	Slope	0.00
				Shrink-swell	0.87		
Burchard	35	Fair		Poor		Poor	
		Organic matter content	0.12	Slope	0.00	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.70
		Too clayey	0.98				
		Water erosion	0.99				
54:							
Zook, occasionally flooded	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Shrink-swell	0.12	Too clayey	0.00
54+:							
Zook, overwash, occasionally flooded	90	Poor		Poor		Poor	
		Too clayey	0.00	Wetness	0.00	Wetness	0.00
		Water erosion	0.99	Shrink-swell	0.12	Too clayey	0.00
59D2:							
Burchard, moderately eroded	55	Fair		Fair		Fair	
		Organic matter content	0.12	Shrink-swell	0.87	Slope	0.37
		Water erosion	0.99				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
59E2:							
Burchard, moderately eroded	55	Fair		Fair		Poor	
		Organic matter content	0.12	Shrink-swell	0.87	Slope	0.00
		Water erosion	0.99	Slope	0.98		
99C2:							
Exira, moderately eroded	80	Fair		Poor		Good	
		Organic matter content	0.50	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
		Too acid	0.95				
99D2:							
Exira, moderately eroded	50	Fair		Poor		Fair	
		Organic matter content	0.50	Low strength	0.00	Slope	0.37
		Water erosion	0.90	Shrink-swell	0.87		
		Too acid	0.95				
99E2:							
Exira, moderately eroded	45	Fair		Poor		Poor	
		Organic matter content	0.50	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Shrink-swell	0.87		
		Too acid	0.95	Slope	0.98		
100B:							
Monona	75	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.96		
100C2:							
Monona, moderately eroded	50	Fair		Poor		Good	
		Organic matter content	0.50	Low strength	0.00		
		Water erosion	0.90				
100D2:							
Monona, moderately eroded	45	Fair		Poor		Fair	
		Organic matter content	0.50	Low strength	0.00	Slope	0.37
		Water erosion	0.90				
100D3:							
Monona, severely eroded	45	Fair		Fair		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100E2:							
Monona, moderately eroded	45	Fair		Poor		Poor	
		Organic matter content	0.50	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Slope	0.92		
100E3:							
Monona, severely eroded	45	Fair		Poor		Poor	
		Organic matter content	0.12	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Slope	0.92		
100F2:							
Monona, moderately eroded	55	Fair		Poor		Poor	
		Organic matter content	0.50	Low strength	0.00	Slope	0.00
		Water erosion	0.90	Slope	0.00		
100F3:							
Monona, severely eroded	70	Fair		Poor		Poor	
		Organic matter content	0.50	Slope	0.00	Slope	0.00
		Water erosion	0.90				
111D3:							
Dow, severely eroded	55	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Carbonate content	0.80				
		Water erosion	0.90				
Monona, severely eroded	40	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				
111E3:							
Dow, severely eroded	55	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Carbonate content	0.80			Carbonate content	0.86
		Water erosion	0.90				
Monona, severely eroded	40	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Water erosion	0.90				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
125D3:							
Ida, severely eroded	50	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				
		Carbonate content	0.97				
Chute, severely eroded	30	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Wind erosion	0.00			Slope	0.37
		Organic matter content	0.12			Carbonate content	0.95
125E3:							
Ida, severely eroded	50	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Water erosion	0.90				
		Carbonate content	0.97				
Chute, severely eroded	30	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.92	Too sandy	0.00
		Wind erosion	0.00			Slope	0.00
		Organic matter content	0.12			Carbonate content	0.95
133:							
Colo, occasionally flooded	85	Fair		Poor		Poor	
		Too clayey	0.95	Wetness	0.00	Wetness	0.00
				Shrink-swell	0.87	Too clayey	0.95
133+:							
Colo, overwash, occasionally flooded	85	Fair		Poor		Poor	
		Too clayey	0.95	Wetness	0.00	Wetness	0.00
				Shrink-swell	0.87	Too clayey	0.95
212:							
Kennebec, occasionally flooded	70	Fair		Poor		Good	
		Water erosion	0.90	Low strength	0.00		
				Shrink-swell	0.87		
212+:							
Kennebec, overwash, occasionally flooded	90	Good		Fair		Good	
				Shrink-swell	0.87		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220:							
Nodaway, occasionally flooded	75	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
266:							
Smithland, occasionally flooded	85	Fair		Poor		Poor	
		Too clayey	0.95	Wetness	0.00	Wetness	0.00
				Shrink-swell	0.87	Too clayey	0.95
266+:							
Smithland, overwash, occasionally flooded	75	Fair		Poor		Poor	
		Too clayey	0.95	Wetness	0.00	Wetness	0.00
				Shrink-swell	0.87	Too clayey	0.95
268D:							
Knox	85	Fair		Fair		Fair	
		Organic matter content	0.88	Shrink-swell	0.89	Slope	0.37
		Water erosion	0.90				
268E:							
Knox	80	Fair		Fair		Poor	
		Organic matter content	0.88	Shrink-swell	0.89	Slope	0.00
		Water erosion	0.90	Slope	0.92		
268F:							
Knox	75	Fair		Poor		Poor	
		Organic matter content	0.88	Slope	0.00	Slope	0.00
		Water erosion	0.90	Shrink-swell	0.89		
430:							
Ackmore, occasionally flooded	75	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Shrink-swell	0.33		
431B:							
Judson	55	Fair		Fair		Fair	
		Too clayey	0.88	Shrink-swell	0.87	Too clayey	0.88
		Water erosion	0.90				
Ackmore, frequently flooded	25	Good		Poor		Poor	
				Wetness	0.00	Wetness	0.00
				Low strength	0.00		
				Shrink-swell	0.33		

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
431B:							
Colo, overwash, frequently flooded	15	Fair		Poor		Poor	
		Too clayey	0.95	Wetness	0.00	Wetness	0.00
				Shrink-swell	0.87	Too clayey	0.95
509B:							
Marshall, terrace---	90	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Too clayey	0.65
		Water erosion	0.90				
		Too clayey	0.99				
509C:							
Marshall, terrace---	85	Fair		Fair		Fair	
		Organic matter content	0.50	Shrink-swell	0.97	Too clayey	0.65
		Water erosion	0.90				
		Too clayey	0.99				
509C2:							
Marshall, terrace, moderately eroded--	65	Fair		Poor		Fair	
		Too clayey	0.99	Low strength	0.00	Too clayey	0.77
				Shrink-swell	0.87		
509D2:							
Marshall, terrace, moderately eroded--	65	Fair		Poor		Fair	
		Too clayey	0.99	Low strength	0.00	Slope	0.37
				Shrink-swell	0.87	Too clayey	0.77
509E2:							
Marshall, terrace, moderately eroded--	65	Fair		Poor		Poor	
		Too clayey	0.99	Low strength	0.00	Slope	0.00
				Shrink-swell	0.87	Too clayey	0.77
				Slope	0.92		
510:							
Monona, terrace-----	100	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				
510B:							
Monona, terrace-----	60	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				
510C2:							
Monona, terrace, moderately eroded--	75	Fair		Good		Good	
		Organic matter content	0.50				
		Water erosion	0.90				

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
510D2:							
Monona, terrace, moderately eroded--	75	Fair		Good		Fair	
		Organic matter content	0.50			Slope	0.37
		Water erosion	0.90				
510E2:							
Monona, terrace, moderately eroded--	75	Fair		Fair		Poor	
		Organic matter content	0.50	Slope	0.92	Slope	0.00
		Water erosion	0.90				
630:							
Danbury, occasionally flooded----------	80	Good		Fair		Fair	
				Shrink-swell	0.45	Wetness	0.53
				Wetness	0.53		
670:							
Rawles, occasionally flooded----------	80	Good		Fair		Good	
				Shrink-swell	0.87		
700:							
Monona, terrace-----	100	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.96		
700B:							
Monona, terrace-----	75	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.96		
700C2:							
Monona, terrace, moderately eroded--	50	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.96		
700D2:							
Monona, terrace, moderately eroded--	60	Fair		Fair		Fair	
		Water erosion	0.90	Shrink-swell	0.96	Slope	0.37
717D:							
Napier----------	50	Fair		Good		Fair	
		Water erosion	0.90			Slope	0.96
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
740D:							
Hawick----------	90	Poor		Good		Poor	
		Too sandy	0.00			Too sandy	0.00
		Droughty	0.09			Rock fragments	0.03
		Organic matter content	0.12			Slope	0.37

Source of Reclamation Material, Roadfill, and Topsoil--Continued

Map symbol and soil name	Pct. of map unit	Potential as source of reclamation material		Potential as source of roadfill		Potential as source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
740E:							
Hawick	90	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.98	Too sandy	0.00
		Droughty	0.09			Slope	0.00
		Organic matter content	0.12			Rock fragments	0.03
740F:							
Hawick	90	Poor		Fair		Poor	
		Too sandy	0.00	Slope	0.18	Slope	0.00
		Droughty	0.09			Too sandy	0.00
		Organic matter content	0.12			Rock fragments	0.03
980C:							
Judson	55	Fair		Fair		Good	
		Water erosion	0.90	Shrink-swell	0.87		
Gullied land, frequently flooded	35	Not rated		Not rated		Not rated	
1220:							
Nodaway, channeled, frequently flooded	80	Fair		Poor		Good	
		Organic matter content	0.12	Low strength	0.00		
		Water erosion	0.90	Shrink-swell	0.87		
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Water Management

The table “Ponds and Embankments” gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The ratings are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect these uses. *Not limited* indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. *Somewhat limited* indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. *Very limited* indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Numerical ratings in the table indicate the severity of individual limitations. The ratings are shown as decimal fractions ranging from 0.01 to 1.00. They indicate gradations between the point at which a soil feature has the greatest negative impact on the use (1.00) and the point at which the soil feature is not a limitation (0.00).

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. Embankments that have zoned construction (core and shell) are not considered. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Ponds and Embankments

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the limitation. See text for further explanation of ratings in this table)

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
1C:							
Ida	95	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
1C3:							
Ida, severely eroded	80	Somewhat limited		Very limited		Very limited	
		Slope	0.92	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
1D3:							
Ida, severely eroded	80	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
1E3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
1F3:							
Ida, severely eroded	70	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
8B:							
Judson	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.19	Depth to water	1.00
		Slope	0.08				
8C:							
Judson	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.19	Depth to water	1.00
		Seepage	0.72				
9:							
Marshall	95	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
9B:							
Marshall	100	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
		Slope	0.08				
9B2:							
Marshall, moderately eroded	85	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
		Slope	0.08				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
9C:							
Marshall	90	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.72				
9C2:							
Marshall, moderately eroded	80	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.72				
9D:							
Marshall	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
9D2:							
Marshall, moderately eroded	70	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
9E2:							
Marshall, moderately eroded	70	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
9E3:							
Marshall, severely eroded	75	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
10B:							
Monona	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.28	Depth to water	1.00
		Slope	0.08				
10B2:							
Monona, moderately eroded	80	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.32	Depth to water	1.00
		Slope	0.08				
10C2:							
Monona, moderately eroded	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
10D2:							
Monona, moderately eroded	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
10D3:							
Monona, severely eroded	95	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
10E2:							
Monona, moderately eroded	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
10E3:							
Monona, severely eroded	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
10F2:							
Monona, moderately eroded	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
10F3:							
Monona, severely eroded	70	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
12B:							
Napier	85	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.68	Depth to water	1.00
		Slope	0.08				
12C:							
Napier	95	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.68	Depth to water	1.00
		Seepage	0.72				
17B:							
Napier	50	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.68	Depth to water	1.00
		Slope	0.08				
Kennebec, frequently flooded	20	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.72	Piping	0.87	Depth to saturated zone	0.81
		Slope	0.08			Slow refill	0.28
						Cutbanks cave	0.10
Nodaway, frequently flooded	15	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Depth to saturated zone	0.81
		Slope	0.08			Slow refill	0.30
						Cutbanks cave	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
22D2:							
Dow, moderately eroded	90	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
22D3:							
Dow, severely eroded	90	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
22E3:							
Dow, severely eroded	80	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
26:							
Kennebec, occasionally flooded	95	Very limited		Very limited		Somewhat limited	
		Seepage	1.00	Piping	1.00	Depth to saturated zone	0.81
						Cutbanks cave	0.10
35D2:							
Liston, moderately eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Burchard, moderately eroded	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				
35E2:							
Liston, moderately eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Burchard, moderately eroded	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				
35F2:							
Liston, moderately eroded	40	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Burchard, moderately eroded	30	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
35G:							
Liston	45	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.05				
Burchard	35	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				
54:							
Zook, occasionally flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
						Cutbanks cave	0.10
				Hard to pack	0.96		
54+:							
Zook, overwash, occasionally flooded	90	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.05	Depth to saturated zone	1.00	Slow refill	0.95
						Cutbanks cave	0.10
				Hard to pack	0.96		
59D2:							
Burchard, moderately eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				
59E2:							
Burchard, moderately eroded	55	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.04				
99C2:							
Exira, moderately eroded	80	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.72				
99D2:							
Exira, moderately eroded	50	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
99E2:							
Exira, moderately eroded	45	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
100B:							
Monona	75	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.24	Depth to water	1.00

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
100C2:							
Monona, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.36	Depth to water	1.00
		Seepage	0.72				
100D2:							
Monona, moderately eroded	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.36	Depth to water	1.00
		Seepage	0.72				
100D3:							
Monona, severely eroded	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.30	Depth to water	1.00
		Seepage	0.72				
100E2:							
Monona, moderately eroded	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.36	Depth to water	1.00
		Seepage	0.72				
100E3:							
Monona, severely eroded	45	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.28	Depth to water	1.00
		Seepage	0.70				
100F2:							
Monona, moderately eroded	55	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.36	Depth to water	1.00
		Seepage	0.72				
100F3:							
Monona, severely eroded	70	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.30	Depth to water	1.00
		Seepage	0.72				
111D3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
Monona, severely eroded	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
111E3:							
Dow, severely eroded	55	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
111E3:							
Monona, severely eroded	40	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
125D3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
Chute, severely eroded	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.26	Depth to water	1.00
		Slope	1.00				
125E3:							
Ida, severely eroded	50	Very limited		Very limited		Very limited	
		Slope	1.00	Piping	1.00	Depth to water	1.00
		Seepage	0.72				
Chute, severely eroded	30	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.26	Depth to water	1.00
		Slope	1.00				
133:							
Colo, occasionally flooded	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
133+:							
Colo, overwash, occasionally flooded	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
212:							
Kennebec, occasionally flooded	70	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Piping	0.99	Depth to saturated zone	0.81
						Slow refill	0.28
						Cutbanks cave	0.10
212+:							
Kennebec, overwash, occasionally flooded	90	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.72	Piping	0.87	Depth to saturated zone	0.81
						Slow refill	0.28
						Cutbanks cave	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
220:							
Nodaway, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Depth to saturated zone	0.81
						Slow refill	0.30
						Cutbanks cave	0.10
266:							
Smithland, occasionally flooded	85	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
266+:							
Smithland, overwash, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
268D:							
Knox	85	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
268E:							
Knox	80	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
268F:							
Knox	75	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
430:							
Ackmore, occasionally flooded	75	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.02	Cutbanks cave	0.10
431B:							
Judson	55	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.19	Depth to water	1.00
Ackmore, frequently flooded	25	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
				Piping	0.02	Cutbanks cave	0.10

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
431B:							
Colo, overwash, frequently flooded	15	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	1.00	Slow refill	0.28
						Cutbanks cave	0.10
509B:							
Marshall, terrace---	90	Somewhat limited		Not limited		Very limited	
		Seepage	0.72			Depth to water	1.00
509C:							
Marshall, terrace---	85	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.72				
509C2:							
Marshall, terrace, moderately eroded--	65	Somewhat limited		Not limited		Very limited	
		Slope	0.92			Depth to water	1.00
		Seepage	0.72				
509D2:							
Marshall, terrace, moderately eroded--	65	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
509E2:							
Marshall, terrace, moderately eroded--	65	Very limited		Not limited		Very limited	
		Slope	1.00			Depth to water	1.00
		Seepage	0.72				
510:							
Monona, terrace-----	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.28	Depth to water	1.00
510B:							
Monona, terrace-----	60	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.28	Depth to water	1.00
510C2:							
Monona, terrace, moderately eroded--	75	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
510D2:							
Monona, terrace, moderately eroded--	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				
510E2:							
Monona, terrace, moderately eroded--	75	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.32	Depth to water	1.00
		Seepage	0.72				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
630:							
Danbury, occasionally flooded	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.72	Depth to saturated zone	0.99	Slow refill	0.28
						Cutbanks cave	0.10
				Piping	0.02	Depth to saturated zone	0.01
670:							
Rawles, occasionally flooded	80	Somewhat limited		Somewhat limited		Somewhat limited	
		Seepage	0.72	Piping	0.84	Depth to saturated zone	0.81
						Slow refill	0.28
						Cutbanks cave	0.10
700:							
Monona, terrace	100	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.24	Depth to water	1.00
700B:							
Monona, terrace	75	Somewhat limited		Somewhat limited		Very limited	
		Seepage	0.72	Piping	0.24	Depth to water	1.00
		Slope	0.08				
700C2:							
Monona, terrace, moderately eroded	50	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.24	Depth to water	1.00
		Seepage	0.72				
700D2:							
Monona, terrace, moderately eroded	60	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.24	Depth to water	1.00
		Seepage	0.72				
717D:							
Napier	50	Very limited		Somewhat limited		Very limited	
		Slope	1.00	Piping	0.68	Depth to water	1.00
		Seepage	0.72				
Gullied land, frequently flooded	35	Very limited		Not rated		Not rated	
		Slope	1.00				
740D:							
Hawick	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.88	Depth to water	1.00
		Slope	1.00				
740E:							
Hawick	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.88	Depth to water	1.00
		Slope	1.00				

Ponds and Embankments--Continued

Map symbol and soil name	Pct. of map unit	Pond reservoir areas		Embankments, dikes, and levees		Aquifer-fed excavated ponds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
740F:							
Hawick	90	Very limited		Somewhat limited		Very limited	
		Seepage	1.00	Seepage	0.88	Depth to water	1.00
		Slope	1.00				
980C:							
Judson	55	Somewhat limited		Somewhat limited		Very limited	
		Slope	0.92	Piping	0.19	Depth to water	1.00
		Seepage	0.72				
Gullied land, frequently flooded	35	Somewhat limited		Not rated		Not rated	
		Slope	0.92				
1220:							
Nodaway, channeled, frequently flooded	80	Somewhat limited		Very limited		Somewhat limited	
		Seepage	0.70	Piping	1.00	Depth to saturated zone	0.81
						Slow refill	0.30
						Cutbanks cave	0.10
5010:							
Pits, sand and gravel	100	Not rated		Not rated		Not rated	
5040:							
Udorthents	100	Not rated		Not rated		Not rated	
5080:							
Udorthents	100	Not rated		Not rated		Not rated	
AW:							
Animal waste lagoon	100	Not rated		Not rated		Not rated	
SL:							
Sewage lagoon	100	Not rated		Not rated		Not rated	
W:							
Water	100	Not rated		Not rated		Not rated	

Soil Properties

Data relating to soil properties are collected during the course of the soil survey.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine particle-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help to characterize key soils.

The estimates of soil properties are shown in tables. They include engineering index properties, physical and chemical properties, and pertinent soil and water features.

Engineering Properties

The table described in this section gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system and the system adopted by the American Association of State Highway and Transportation Officials.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487–00.

Engineering Properties

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
1C:													
Ida	95	0-8	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	95-100	30-40	5-15
		8-60	Silt loam	ML	A-4, A-6	0	0	100	100	95-100	95-100	30-40	5-15
1C3:													
Ida, severely eroded	80	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
1D3:													
Ida, severely eroded	80	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
1E3:													
Ida, severely eroded	70	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
1F3:													
Ida, severely eroded	70	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
8B:													
Judson	80	0-9	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-50	10-25
		9-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-50	15-25
		28-52	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
		52-60	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
8C:													
Judson	95	0-9	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-50	10-25
		9-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-50	15-25
		28-52	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
		52-60	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
9:													
Marshall	95	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
9B:													
Marshall--------	100	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
9B2:													
Marshall, moderately eroded---------	85	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
9C:													
Marshall--------	90	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
9C2:													
Marshall, moderately eroded---------	80	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
9D:													
Marshall--------	85	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
9D2:													
Marshall, moderately eroded	70	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
9E2:													
Marshall, moderately eroded	70	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
9E3:													
Marshall, severely eroded	75	0-5	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		5-46	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		46-68	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
10B:													
Monona	100	0-8	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		8-15	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		15-30	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		30-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10B2:													
Monona, moderately eroded	80	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10C2:													
Monona, moderately eroded	75	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
10D2:													
Monona, moderately eroded---------	60	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10D3:													
Monona, severely eroded---------	95	0-7	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10E2:													
Monona, moderately eroded---------	50	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10E3:													
Monona, severely eroded---------	60	0-7	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10F2:													
Monona, moderately eroded---------	45	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
10F3:													
Monona, severely eroded---------	70	0-7	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
12B:													
Napier----------	85	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		8-29	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		29-48	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		48-60	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
12C:													
Napier----------	95	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		8-29	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		29-48	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		48-60	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
17B:													
Napier----------	50	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		8-29	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		29-48	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		48-60	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
Kennebec, frequently flooded--------	20	0-8	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		8-41	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		41-54	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
		54-80	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
Nodaway, frequently flooded--------	15	0-7	Silt loam	CL	A-6, A-4	0	0	100	94-100	90-100	86-100	25-35	5-15
		7-31	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15
		31-42	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-100	25-40	5-15
		42-80	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
22D2:													
Dow, moderately eroded---------	90	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	25-40	5-15
		6-80	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
22D3:													
Dow, severely eroded---------	90	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	25-40	5-15
		6-80	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
22E3:													
Dow, severely eroded---------	80	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	25-40	5-15
		6-80	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
26:													
Kennebec, occasionally flooded--------	95	0-8	Silty clay loam	CL	A-6	0	0	95-100	95-100	95-100	95-100	30-40	10-20
		8-41	Silty clay loam	ML	A-4	0	0	95-100	95-100	95-100	95-100	25-40	5-12
		41-54	Silty clay loam	ML	A-4	0	0	95-100	95-100	95-100	95-100	---	NP
		54-80	Silty clay loam	ML	A-4	0	0	95-100	95-100	95-100	95-100	---	NP
35D2:													
Liston, moderately eroded---------	50	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	55-90	30-50	15-25
		5-38	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	70-90	30-55	12-30
		38-80	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	60-75	25-55	10-30
Burchard, moderately eroded---------	35	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		5-13	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		13-37	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		37-80	Clay loam, loam		A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
35E2:													
Liston, moderately eroded	50	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	55-90	30-50	15-25
		5-38	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	70-90	30-55	12-30
		38-80	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	60-75	25-55	10-30
Burchard, moderately eroded	35	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		5-13	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		13-37	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		37-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30
35F2:													
Liston, moderately eroded	40	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	55-90	30-50	15-25
		5-38	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	70-90	30-55	12-30
		38-80	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	60-75	25-55	10-30
Burchard, moderately eroded	30	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		5-13	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		13-37	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		37-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30
35G:													
Liston	45	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-100	55-90	30-50	15-25
		5-38	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	70-90	30-55	12-30
		38-80	Loam, clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	90-100	60-75	25-55	10-30
Burchard	35	0-11	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		11-24	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		24-36	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		36-60	Clay loam, loam	CL	A-7, A-6	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas-ticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
54:													
Zook, occasionally flooded--------	90	0-6	Silty clay loam	CL	A-7	0	0	100	100	95-100	95-100	45-65	20-35
		6-20	Silty clay loam	CL	A-7	0	0	100	100	95-100	95-100	45-65	20-35
		20-52	Silty clay, silty clay loam	CH	A-7	0	0	100	100	95-100	95-100	60-85	35-55
		52-60	Silty clay loam, silty clay, silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-80	10-50
54+:													
Zook, overwash, occasionally flooded--------	90	0-6	Silt loam	CL	A-7	0	0	100	100	95-100	95-100	45-65	20-35
		6-20	Silty clay loam	CL	A-7	0	0	100	100	95-100	95-100	45-65	20-35
		20-52	Silty clay, silty clay loam	CH	A-7	0	0	100	100	95-100	95-100	60-85	35-55
		52-60	Silty clay loam, silty clay, silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-80	10-50
59D2:													
Burchard, moderately eroded---------	55	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		5-13	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		13-37	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		37-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30
59E2:													
Burchard, moderately eroded---------	55	0-5	Clay loam	CL	A-6, A-7	0	0-5	95-100	95-100	85-95	60-80	35-50	14-24
		5-13	Clay loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		13-37	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	20-30
		37-80	Clay loam, loam	CL	A-6, A-7	0	0-5	95-100	85-100	75-95	60-80	35-50	15-30

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
99C2:													
Exira, moderately eroded---	80	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		6-40	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		40-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
99D2:													
Exira, moderately eroded---	50	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		6-40	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		40-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
99E2:													
Exira, moderately eroded---	45	0-6	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		6-40	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		40-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
100B:													
Monona---	75	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-20	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		20-48	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		48-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
100C2:													
Monona, moderately eroded---------	50	0-6	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
100D2:													
Monona, moderately eroded---------	45	0-6	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
100D3:													
Monona, severely eroded---------	45	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-36	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		36-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
100E2:													
Monona, moderately eroded---------	45	0-6	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
100E3:													
Monona, severely eroded---------	45	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-36	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		36-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
100F2:													
Monona, moderately eroded---	55	0-6	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
100F3:													
Monona, severely eroded---	70	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-36	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		36-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
111D3:													
Dow, severely eroded---	55	0-6	Silt loam	CL, CL-ML	A-6, A-4	0	0	100	100	95-100	95-100	25-40	5-15
		6-80	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
Monona, severely eroded---	40	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-36	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		36-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
111E3:													
Dow, severely eroded---	55	0-6	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
		6-60	Silt loam	CL-ML, CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	5-15
Monona, severely eroded---	40	0-7	Silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-36	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		36-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
125D3:													
Ida, severely eroded---------	50	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
Chute, severely eroded---------	30	0-4	Loamy fine sand	SM	A-2	0	0	100	100	70-85	10-35	0-14	NP
		4-60	Fine sand, sand, loamy fine sand	SM	A-2, A-3	0	0	100	95-100	70-95	5-25	0-14	NP
125E3:													
Ida, severely eroded---------	50	0-3	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
		3-80	Silt loam	ML	A-6, A-4	0	0	100	100	95-100	95-100	30-40	5-15
Chute, severely eroded---------	30	0-4	Loamy fine sand	SM	A-2	0	0	100	100	70-85	10-35	0-14	NP
		4-60	Fine sand, sand, loamy fine sand	SM	A-2, A-3	0	0	100	95-100	70-95	5-25	0-14	NP
133:													
Colo, occasionally flooded--------	85	0-8	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		8-34	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		34-51	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
		51-60	Silty clay loam, clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
133+:													
Colo, overwash, occasionally flooded--------	85	0-8	Silty clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
		8-34	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		34-51	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
		51-60	Silty clay loam, clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
212:													
Kennebec, occasionally flooded--------	70	0-8	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		8-41	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		41-54	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
		54-80	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
212+:													
Kennebec, overwash, occasionally flooded--------	90	0-8	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		8-41	Silt loam	CL	A-7, A-6	0	0	100	100	95-100	90-100	25-45	10-20
		41-54	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
		54-80	Silt loam, silty clay loam	CL	A-4, A-6	0	0	100	100	95-100	90-100	25-40	5-15
220:													
Nodaway, occasionally flooded--------	75	0-7	Silt loam	CL	A-6, A-4	0	0	100	94-100	90-100	86-100	25-35	5-15
		7-31	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15
		31-42	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-100	25-40	5-15
		42-80	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
266:													
Smithland, occasionally flooded	85	0-7	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		7-34	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		34-50	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
		50-60	Silty clay loam, clay loam, silt loam	CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
266+:													
Smithland, overwash, occasionally flooded	75	0-8	Silt loam	CL	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		8-34	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		34-50	Silty clay loam	CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
		50-60	Silty clay loam, clay loam, silt loam	CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
268D:													
Knox	85	0-7	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		7-12	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		12-61	Silty clay loam, silt loam	CL	A-7	0	0	100	100	95-100	95-100	40-50	20-30
		61-70	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
268E:													
Knox	80	0-7	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		7-12	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		12-61	Silty clay loam, silt loam	CL	A-7	0	0	100	100	95-100	95-100	40-50	20-30
		61-70	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25
268F:													
Knox	75	0-7	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		7-12	Silt loam	ML, CL, CL-ML	A-4, A-6	0	0	100	100	95-100	90-100	20-35	2-15
		12-61	Silty clay loam, silt loam	CL	A-7	0	0	100	100	95-100	95-100	40-50	20-30
		61-70	Silt loam	CL	A-6, A-7	0	0	100	100	95-100	90-100	30-45	10-25

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
430:													
Ackmore, occasionally flooded--------	75	0-6	Silt loam	ML, CL	A-4, A-7, A-6	0	0	100	100	95-100	85-100	25-50	8-20
		6-25	Silt loam, silty clay loam	CL, ML	A-6, A-4, A-7	0	0	100	100	95-100	85-100	25-50	8-20
		25-60	Silty clay loam, silt loam	CH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-60	15-30
431B:													
Judson----------	55	0-9	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-50	10-25
		9-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-50	15-25
		28-52	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
		52-60	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
Ackmore, frequently flooded--------	25	0-6	Silt loam	ML, CL	A-4, A-7, A-6	0	0	100	100	95-100	85-100	25-50	8-20
		6-25	Silt loam, silty clay loam	CL, ML	A-6, A-4, A-7	0	0	100	100	95-100	85-100	25-50	8-20
		25-60	Silty clay loam, silt loam	CH, CL	A-6, A-7	0	0	100	100	95-100	85-100	35-60	15-30
Colo, overwash, frequently flooded--------	15	0-8	Silty clay loam, clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
		8-34	Silty clay loam	CL, CH	A-7	0	0	100	100	90-100	90-100	40-60	15-30
		34-51	Silty clay loam	CH, CL	A-7	0	0	100	100	90-100	90-100	40-55	20-30
		51-60	Silty clay loam, clay loam, silt loam	CH, CL	A-7	0	0	100	100	95-100	80-100	40-55	15-30
509B:													
Marshall, terrace--------	90	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
509C:													
Marshall, terrace--------	85	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-22	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		22-65	Silty clay loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
		65-80	Silty clay loam, silt loam	CL	A-7, A-6	0	0	100	100	100	95-100	35-50	15-25
509C2:													
Marshall, terrace, moderately eroded---------	65	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
509D2:													
Marshall, terrace, moderately eroded---------	65	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
509E2:													
Marshall, terrace, moderately eroded---------	65	0-7	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		7-47	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25
		47-80	Silty clay loam, silt loam	CL	A-6, A-7	0	0	100	100	100	95-100	35-50	15-25

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
510:													
Monona, terrace	100	0-8	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		8-15	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		15-30	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		30-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
510B:													
Monona, terrace	60	0-8	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		8-15	Silt loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		15-30	Silt loam, silty clay loam	ML	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		30-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
510C2:													
Monona, terrace, moderately eroded	75	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
510D2:													
Monona, terrace, moderately eroded	75	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
510E2:													
Monona, terrace, moderately eroded	75	0-7	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		7-24	Silt loam	ML, CL	A-6, A-7	0	0	100	100	95-100	95-100	35-50	10-25
		24-60	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
630:													
Danbury, occasionally flooded--------	80	0-7	Silt loam, silty clay loam	ML	A-6	0	0	100	100	95-100	85-100	25-50	8-20
		7-32	Silty clay loam, silt loam	ML	A-6	0	0	100	100	95-100	85-100	25-50	8-20
		32-64	Silty clay loam, silt loam	CL	A-7	0	0	100	100	95-100	85-100	35-60	15-30
		64-80	Silty clay loam, silt loam	CL	A-7	0	0	100	100	95-100	85-100	35-60	15-30
670:													
Rawles, occasionally flooded--------	80	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-15
		8-26	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	25-40	5-15
		26-60	Silt loam, silty clay loam	CL	A-6, A-7	0	0	100	100	100	90-100	30-45	10-20
700:													
Monona, terrace	100	0-6	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-16	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		16-49	Silty clay loam, silt loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		49-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
700B:													
Monona, terrace	75	0-6	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-16	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		16-49	Silty clay loam, silt loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		49-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
700C2:													
Monona, terrace, moderately eroded	50	0-6	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-49	Silty clay loam, silt loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		49-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
700D2:													
Monona, terrace, moderately eroded	60	0-6	Silty clay loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		6-49	Silty clay loam, silt loam	ML	A-7	0	0	100	100	95-100	95-100	35-50	10-25
		49-80	Silt loam	CL	A-6	0	0	100	100	95-100	95-100	30-40	10-20
717D:													
Napier	50	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		8-29	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		29-48	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
		48-60	Silt loam	CL	A-4, A-6	0	0	100	100	95-100	95-100	25-40	8-20
Gullied land, frequently flooded	35	---	---	---	---	---	---	---	---	---	---	---	---
740D:													
Hawick	90	0-7	Gravelly sandy loam	SM, SP-SM	A-1, A-3, A-2	0-2	0-5	75-95	60-95	35-70	5-35	0-14	NP-4
		7-11	Gravelly loamy sand, gravelly coarse sand, loamy sand	SP-SM	A-1, A-2, A-3	0-2	0-5	75-95	60-95	35-70	5-25	0-14	NP
		11-80	Gravelly coarse sand	SP-SM, SP	A-2, A-1, A-3	0-2	0-5	60-95	50-95	30-65	2-10	0-14	NP

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
740E:													
Hawick----------	90	0-7	Gravelly sandy loam	SM, SP-SM	A-1, A-3, A-2	0-2	0-5	75-95	60-95	35-70	5-35	0-14	NP-4
		7-11	Gravelly loamy sand, gravelly coarse sand, loamy sand	SP-SM	A-1, A-2, A-3	0-2	0-5	75-95	60-95	35-70	5-25	0-14	NP
		11-80	Gravelly coarse sand	SP-SM, SP	A-2, A-1, A-3	0-2	0-5	60-95	50-95	30-65	2-10	0-14	NP
740F:													
Hawick----------	90	0-7	Gravelly sandy loam	SM, SP-SM	A-1, A-3, A-2	0-2	0-5	75-95	60-95	35-70	5-35	0-14	NP-4
		7-11	Gravelly loamy sand, gravelly coarse sand, loamy sand	SP-SM	A-1, A-2, A-3	0-2	0-5	75-95	60-95	35-70	5-25	0-14	NP
		11-80	Gravelly coarse sand	SP-SM, SP	A-2, A-1, A-3	0-2	0-5	60-95	50-95	30-65	2-10	0-14	NP
980C:													
Judson----------	55	0-9	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	100	95-100	35-50	10-25
		9-28	Silty clay loam	CL	A-6, A-7	0	0	100	100	100	95-100	30-50	15-25
		28-52	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
		52-60	Silty clay loam	CL, CL-ML	A-6, A-7, A-4	0	0	100	100	100	95-100	25-50	5-25
Gullied land, frequently flooded--------	35	---	---	---	---	---	---	---	---	---	---	---	---

Engineering Properties--Continued

Map symbol and soil name	Pct. of map unit	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
				Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
		In				Pct	Pct					Pct	
1220:													
Nodaway, channeled, frequently flooded--------	80	0-7	Silt loam	CL	A-6, A-4	0	0	100	94-100	90-100	86-100	25-35	5-15
		7-31	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15
		31-42	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-100	25-40	5-15
		42-80	Stratified silt loam to silty clay loam, silt loam, silty clay loam	CL	A-6, A-4	0	0	100	94-100	88-100	84-99	25-40	5-15
5010. Pits, sand and gravel													
5040. Udorthents													
5080. Udorthents													
AW. Animal waste lagoon													
SL. Sewage lagoon													
W. Water													

Physical Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

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

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

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $^1/_3$- or $^1/_{10}$-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute linear extensibility, shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The term "permeability," as used in soil surveys, indicates saturated hydraulic conductivity (Ksat). The estimates in the table indicate the rate of water movement, in micrometers per second, when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems and septic tank absorption fields.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each soil layer. The capacity varies, depending on soil properties that affect retention of water. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at $^1/_3$- or $^1/_{10}$-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

Erosion factors are shown in the table as the K factor (Kw and Kf) and the T factor. Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) and the Revised Universal Soil Loss Equation (RUSLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter and on soil structure and permeability. Values of K range from 0.02 to 0.69. Other factors being equal, the higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor Kw indicates the erodibility of the whole soil. The estimates are modified by the presence of rock fragments.

Erosion factor Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are described in the “National Soil Survey Handbook,” which is available in local offices of the Natural Resources Conservation Service or on the Internet.

Wind erodibility index is a numerical value indicating the susceptibility of soil to wind erosion, or the tons per acre per year that can be expected to be lost to wind erosion. There is a close correlation between wind erosion and the texture of the surface layer, the size and durability of surface clods, rock fragments, organic matter, and a calcareous reaction. Soil moisture and frozen soil layers also influence wind erosion.

Physical Properties of the Soils

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer. Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
1C:													
Ida	95	0-8	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	2.0-3.0	.32	.32	5	4L	86
		8-60	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
1C3:													
Ida, severely eroded	80	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
1D3:													
Ida, severely eroded	80	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
1E3:													
Ida, severely eroded	70	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
1F3:													
Ida, severely eroded	70	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
8B:													
Judson	80	0-9	27-32	1.30-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	7	38
		9-28	30-35	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	3.0-3.5	.28	.28			
		28-52	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-2.0	.43	.43			
		52-60	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-1.0	.43	.43			
8C:													
Judson	95	0-9	27-32	1.30-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	7	38
		9-28	30-35	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	3.0-3.5	.28	.28			
		28-52	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-2.0	.43	.43			
		52-60	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-1.0	.43	.43			
9:													
Marshall	95	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
9B:													
Marshall	100	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
9B2:													
Marshall, moderately eroded	85	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-1.5	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
9C:													
Marshall	90	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	7	38
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
9C2:													
Marshall, moderately eroded	80	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-1.5	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
9D:													
Marshall	85	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	7	38
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
9D2:													
Marshall, moderately eroded	70	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-1.5	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
9E2:													
Marshall, moderately eroded	70	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	1.0-1.5	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
9E3:													
Marshall, severely eroded	75	0-5	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	1.0-2.0	.32	.32	4	7	38
		5-46	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
		46-68	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
10B:													
Monona	100	0-8	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.28	.28	5	6	48
		8-15	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-3.5	.28	.28			
		15-30	24-32	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		30-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10B2:													
Monona, moderately eroded	80	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10C2:													
Monona, moderately eroded	75	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10D2:													
Monona, moderately eroded	60	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10D3:													
Monona, severely eroded	95	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10E2:													
Monona, moderately eroded	50	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
10E3:													
Monona, severely eroded	60	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10F2:													
Monona, moderately eroded	45	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
10F3:													
Monona, severely eroded	70	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
12B:													
Napier	85	0-8	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		8-29	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-3.5	.28	.28			
		29-48	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43			
		48-60	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
12C:													
Napier	95	0-8	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		8-29	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-3.5	.28	.28			
		29-48	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43			
		48-60	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
17B:													
Napier	50	0-8	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		8-29	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-3.5	.28	.28			
		29-48	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43			
		48-60	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
Kennebec, frequently flooded	20	0-8	22-26	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.28	.28	5	6	48
		8-41	24-32	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	5.0-6.0	.28	.28			
		41-54	24-32	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	5.0-6.0	.43	.43			
		54-80	24-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
17B:													
Nodaway, frequently flooded	15	0-7	18-27	1.25-1.35	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
		7-31	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		31-42	18-30	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		42-80	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
22D2:													
Dow, moderately eroded	90	0-6	18-25	1.20-1.45	0.6-2	0.22-0.24	0.0-2.9	2.0-3.0	.43	.43	5	4L	86
		6-80	18-25	1.30-1.45	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
22D3:													
Dow, severely eroded	90	0-6	18-25	1.20-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		6-80	18-25	1.30-1.45	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
22E3:													
Dow, severely eroded	80	0-6	18-25	1.20-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		6-80	18-25	1.30-1.45	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
26:													
Kennebec, occasionally flooded	95	0-8	27-30	1.25-1.40	0.6-2	0.22-0.24	0.0-2.9	5.0-6.0	.28	.28	5	6	48
		8-41	27-32	1.35-1.50	0.6-2	0.14-0.19	0.0-2.9	5.0-5.5	.32	.32			
		41-54	27-33	1.55-1.65	0.6-2	0.02-0.04	0.0-2.9	2.0-3.0	.10	.10			
		54-80	27-30	1.55-1.65	0.6-2	0.02-0.04	0.0-2.9	2.0-3.0	.10	.10			
35D2:													
Liston, moderately eroded	50	0-5	24-35	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.32	.32	5	4L	86
		5-38	27-33	1.30-1.60	0.2-0.6	0.15-0.17	3.0-5.9	1.0-2.0	.32	.32			
		38-80	26-40	1.50-1.80	0.2-0.6	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Burchard, moderately eroded	35	0-5	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28	5	6	48
		5-13	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		13-37	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		37-80	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
35E2:													
Liston, moderately eroded	50	0-5	24-35	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.32	.32	5	4L	86
		5-38	27-33	1.30-1.60	0.2-0.6	0.15-0.17	3.0-5.9	1.0-2.0	.32	.32			
		38-80	26-40	1.50-1.80	0.2-0.6	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
35E2:													
Burchard, moderately eroded	35	0-5	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28	5	6	48
		5-13	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		13-37	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		37-80	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
35F2:													
Liston, moderately eroded	40	0-5	24-35	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.32	.32	5	4L	86
		5-38	27-33	1.30-1.60	0.2-0.6	0.15-0.17	3.0-5.9	1.0-2.0	.32	.32			
		38-80	26-40	1.50-1.80	0.2-0.6	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Burchard, moderately eroded	30	0-5	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28	5	6	48
		5-13	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		13-37	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		37-80	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
35G:													
Liston	45	0-5	24-35	1.30-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.32	.32	5	4L	86
		5-38	27-33	1.30-1.60	0.2-0.6	0.15-0.17	3.0-5.9	1.0-2.0	.32	.32			
		38-80	26-40	1.50-1.80	0.2-0.6	0.14-0.19	3.0-5.9	0.5-1.0	.32	.32			
Burchard	35	0-11	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-4.0	.28	.28	5	6	48
		11-24	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		24-36	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		36-60	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
54:													
Zook, occasionally flooded	90	0-6	35-40	1.30-1.35	0.2-0.6	0.21-0.23	6.0-8.9	5.0-7.0	.37	.37	5	7	38
		6-20	35-40	1.30-1.35	0.2-0.6	0.21-0.23	6.0-8.9	5.0-6.5	.37	.37			
		20-52	36-45	1.30-1.45	0.06-0.2	0.11-0.13	6.0-8.9	2.0-4.0	.28	.28			
		52-60	20-45	1.30-1.45	0.06-0.2	0.11-0.22	6.0-8.9	0.0-1.0	.28	.28			
54+:													
Zook, overwash, occasionally flooded	90	0-6	22-27	1.30-1.35	0.2-0.6	0.21-0.23	6.0-8.9	2.0-4.0	.37	.37	5	7	38
		6-20	35-40	1.30-1.35	0.2-0.6	0.21-0.23	6.0-8.9	5.0-6.5	.37	.37			
		20-52	36-45	1.30-1.45	0.06-0.2	0.11-0.13	6.0-8.9	2.0-4.0	.28	.28			
		52-60	20-45	1.30-1.45	0.06-0.2	0.11-0.22	6.0-8.9	0.0-1.0	.28	.28			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
59D2:													
Burchard, moderately eroded	55	0-5	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28	5	6	48
		5-13	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		13-37	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		37-80	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
59E2:													
Burchard, moderately eroded	55	0-5	18-30	1.40-1.60	0.2-0.6	0.17-0.19	3.0-5.9	2.0-3.0	.28	.28	5	6	48
		5-13	27-35	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		13-37	18-30	1.40-1.60	0.2-0.6	0.15-0.17	3.0-5.9	0.5-1.0	.37	.37			
		37-80	18-30	1.40-1.60	0.2-0.6	0.14-0.16	3.0-5.9	0.0-0.5	.37	.37			
99C2:													
Exira, moderately eroded	80	0-6	28-34	1.25-1.35	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-40	25-35	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		40-80	20-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
99D2:													
Exira, moderately eroded	50	0-6	28-34	1.25-1.35	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-40	25-35	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		40-80	20-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
99E2:													
Exira, moderately eroded	45	0-6	28-34	1.25-1.35	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-40	25-35	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		40-80	20-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
100B:													
Monona	75	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.32	.32	5	7	38
		7-20	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32			
		20-48	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
		48-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100C2:													
Monona, moderately eroded	50	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		24-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
100D2:													
Monona, moderately eroded	45	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		24-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100D3:													
Monona, severely eroded	45	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	7	38
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-36	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		36-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100E2:													
Monona, moderately eroded	45	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		24-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100E3:													
Monona, severely eroded	45	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	38
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-36	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		36-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100F2:													
Monona, moderately eroded	55	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		24-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
100F3:													
Monona, severely eroded	70	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-36	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		36-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
111D3:													
Dow, severely eroded	55	0-6	18-25	1.20-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		6-80	18-25	1.30-1.45	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
111D3:													
Monona, severely eroded	40	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-36	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		36-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
111E3:													
Dow, severely eroded	55	0-6	18-25	1.20-1.45	0.6-2	0.22-0.24	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		6-60	18-25	1.30-1.45	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
Monona, severely eroded	40	0-7	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	1.0-2.0	.43	.43	4	4L	86
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		24-36	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.0	.43	.43			
		36-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
125D3:													
Ida, severely eroded	50	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
Chute, severely eroded	30	0-4	5-10	1.45-1.66	6-20	0.11-0.13	0.0-2.9	1.0-2.0	.17	.17	5	2	134
		4-60	1-8	1.60-1.75	6-20	0.06-0.09	0.0-2.9	0.0-0.5	.15	.15			
125E3:													
Ida, severely eroded	50	0-3	18-27	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43	4	4L	86
		3-80	18-25	1.20-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
Chute, severely eroded	30	0-4	5-10	1.45-1.66	6-20	0.11-0.13	0.0-2.9	1.0-2.0	.17	.17	5	2	134
		4-60	1-8	1.60-1.75	6-20	0.06-0.09	0.0-2.9	0.0-0.5	.15	.15			
133:													
Colo, occasionally flooded	85	0-8	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	3.0-5.0	.28	.28	5	7	38
		8-34	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	3.0-5.0	.28	.28			
		34-51	30-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
		51-60	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32			
133+:													
Colo, overwash, occasionally flooded	85	0-8	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	2.0-5.0	.32	.32	5	6	38
		8-34	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	3.0-5.0	.28	.28			
		34-51	30-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
		51-60	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
212:													
Kennebec, occasionally flooded	70	0-8	22-26	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.28	.28	5	6	48
		8-41	24-32	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	5.0-6.0	.28	.28			
		41-54	24-32	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	5.0-6.0	.43	.43			
		54-80	24-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
212+:													
Kennebec, overwash, occasionally flooded	90	0-8	22-26	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	2.0-4.0	.28	.28	5	6	48
		8-41	24-32	1.25-1.35	0.6-2	0.22-0.24	3.0-5.9	5.0-6.0	.28	.28			
		41-54	24-32	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	5.0-6.0	.43	.43			
		54-80	24-30	1.35-1.40	0.6-2	0.20-0.22	3.0-5.9	1.0-2.0	.43	.43			
220:													
Nodaway, occasionally flooded	75	0-7	18-27	1.25-1.35	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
		7-31	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		31-42	18-30	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		42-80	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
266:													
Smithland, occasionally flooded	85	0-7	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	5.0-7.0	.28	.28	5	7	38
		7-34	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	5.0-6.5	.28	.28			
		34-50	30-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
		50-60	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32			
266+:													
Smithland, overwash, occasionally flooded	75	0-8	25-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.28	.28	5	7	38
		8-34	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	5.0-6.5	.28	.28			
		34-50	30-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
		50-60	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32			
268D:													
Knox	85	0-7	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
		7-12	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32			
		12-61	25-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		61-70	18-27	1.20-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
268E:													
Knox	80	0-7	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
		7-12	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32			
		12-61	25-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		61-70	18-27	1.20-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
268F:													
Knox	75	0-7	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32	5	6	48
		7-12	18-27	1.20-1.30	0.6-2	0.22-0.24	0.0-2.9	1.0-3.0	.32	.32			
		12-61	25-35	1.30-1.40	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.43	.43			
		61-70	18-27	1.20-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
430:													
Ackmore, occasionally flooded	75	0-6	18-27	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.32	.32	5	6	48
		6-25	18-30	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.32	.32			
		25-60	26-38	1.30-1.40	0.2-0.6	0.18-0.20	6.0-8.9	3.0-5.0	.32	.32			
431B:													
Judson	55	0-9	27-32	1.30-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	7	38
		9-28	30-35	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	3.0-3.5	.28	.28			
		28-52	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-2.0	.43	.43			
		52-60	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-1.0	.43	.43			
Ackmore, frequently flooded	25	0-6	18-27	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-4.0	.32	.32	5	6	48
		6-25	18-30	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.32	.32			
		25-60	26-38	1.30-1.40	0.6-2	0.18-0.20	6.0-8.9	3.0-5.0	.32	.32			
Colo, overwash, frequently flooded	15	0-8	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	3.0-5.0	.32	.32	5	6	38
		8-34	27-36	1.28-1.32	0.6-2	0.21-0.23	3.0-5.9	3.0-5.0	.28	.28			
		34-51	30-35	1.25-1.35	0.6-2	0.18-0.20	3.0-5.9	3.0-4.0	.28	.28			
		51-60	25-35	1.35-1.45	0.6-2	0.18-0.20	3.0-5.9	1.0-2.0	.32	.32			
509B:													
Marshall, terrace	90	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			
509C:													
Marshall, terrace	85	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		7-22	27-35	1.25-1.30	0.6-2	0.21-0.23	0.0-2.9	3.0-4.0	.28	.28			
		22-65	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
		65-80	22-30	1.30-1.40	0.6-2	0.20-0.22	3.0-5.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
509C2:													
Marshall, terrace, moderately eroded----	65	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
509D2:													
Marshall, terrace, moderately eroded----	65	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
509E2:													
Marshall, terrace, moderately eroded----	65	0-7	27-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		7-47	27-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.5-1.0	.32	.32			
		47-80	23-34	1.30-1.35	0.6-2	0.18-0.20	3.0-5.9	0.0-1.0	.43	.43			
510:													
Monona, terrace-------	100	0-8	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.28	.28	5	6	48
		8-15	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-3.5	.28	.28			
		15-30	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		30-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
510B:													
Monona, terrace-------	60	0-8	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.28	.28	5	6	48
		8-15	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-3.5	.28	.28			
		15-30	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		30-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
510C2:													
Monona, terrace, moderately eroded----	75	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
510D2:													
Monona, terrace, moderately eroded----	75	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	4	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
510E2:													
Monona, terrace, moderately eroded----	75	0-7	20-27	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	6	48
		7-24	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	1.0-1.5	.43	.43			
		24-60	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
630:													
Danbury, occasionally flooded----------	80	0-7	20-30	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.32	.32	5	6	48
		7-32	18-35	1.25-1.30	0.6-2	0.21-0.23	3.0-5.9	1.0-2.5	.32	.32			
		32-64	26-40	1.30-1.40	0.2-0.6	0.18-0.20	6.0-8.9	3.0-4.0	.32	.32			
		64-80	26-38	1.30-1.40	0.2-0.6	0.18-0.20	6.0-8.9	2.0-3.0	.32	.32			
670:													
Rawles, occasionally flooded----------	80	0-8	18-27	1.25-1.35	0.6-2	0.21-0.23	3.0-5.9	1.0-3.0	.32	.32	5	4L	86
		8-26	18-27	1.25-1.35	0.6-2	0.21-0.23	3.0-5.9	1.0-2.5	.32	.32			
		26-60	22-35	1.35-1.40	0.6-2	0.19-0.21	3.0-5.9	3.0-4.0	.32	.32			
700:													
Monona, terrace-------	100	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.32	.32	5	7	38
		6-16	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-3.5	.32	.32			
		16-49	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		49-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
700B:													
Monona, terrace-------	75	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-4.0	.32	.32	5	7	38
		6-16	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	3.0-3.5	.32	.32			
		16-49	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		49-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
700C2:													
Monona, terrace, moderately eroded----	50	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-49	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		49-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			
700D2:													
Monona, terrace, moderately eroded----	60	0-6	27-30	1.25-1.30	0.6-2	0.22-0.24	3.0-5.9	2.0-3.0	.32	.32	5	7	38
		6-49	24-28	1.30-1.35	0.6-2	0.20-0.22	3.0-5.9	0.5-1.5	.43	.43			
		49-80	18-24	1.35-1.40	0.6-2	0.20-0.22	0.0-2.9	0.0-1.0	.43	.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
717D:													
Napier	50	0-8	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-4.0	.28	.28	5	6	48
		8-29	20-27	1.20-1.25	0.6-2	0.22-0.24	0.0-2.9	3.0-3.5	.28	.28			
		29-48	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	1.0-2.0	.43	.43			
		48-60	20-27	1.25-1.30	0.6-2	0.20-0.22	0.0-2.9	0.0-0.5	.43	.43			
Gullied land, frequently flooded	35	---	---	---	---	---	---	---	---	---	-	---	---
740D:													
Hawick	90	0-7	2-10	1.50-1.65	2-20	0.03-0.13	0.0-2.9	1.0-3.0	.10	.15	3	3	86
		7-11	1-10	1.50-1.65	6-20	0.03-0.10	0.0-2.9	0.0-0.5	.10	.15			
		11-80	1-5	1.55-1.65	20-101	0.02-0.06	0.0-2.9	0.0-0.5	.10	.15			
740E:													
Hawick	90	0-7	2-10	1.50-1.65	2-20	0.03-0.13	0.0-2.9	1.0-3.0	.10	.15	3	3	86
		7-11	1-10	1.50-1.65	6-20	0.03-0.10	0.0-2.9	0.0-0.5	.10	.15			
		11-80	1-5	1.55-1.65	20-101	0.02-0.06	0.0-2.9	0.0-0.5	.10	.15			
740F:													
Hawick	90	0-7	2-10	1.50-1.65	2-20	0.03-0.13	0.0-2.9	1.0-3.0	.10	.15	3	3	86
		7-11	1-10	1.50-1.65	6-20	0.03-0.10	0.0-2.9	0.0-0.5	.10	.15			
		11-80	1-5	1.55-1.65	20-101	0.02-0.06	0.0-2.9	0.0-0.5	.10	.15			
980C:													
Judson	55	0-9	27-32	1.30-1.35	0.6-2	0.21-0.23	3.0-5.9	3.0-4.0	.28	.28	5	7	38
		9-28	27-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	3.0-3.5	.28	.28			
		28-52	25-35	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	1.0-2.0	.43	.43			
		52-60	25-32	1.35-1.45	0.6-2	0.21-0.23	3.0-5.9	0.5-1.0	.43	.43			
Gullied land, frequently flooded	35	---	---	---	---	---	---	---	---	---	-	---	---
1220:													
Nodaway, channeled, frequently flooded	80	0-7	18-27	1.25-1.35	0.6-2	0.20-0.23	0.0-2.9	2.0-4.0	.32	.32	5	6	48
		7-31	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		31-42	18-30	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
		42-80	18-28	1.25-1.35	0.6-2	0.20-0.23	3.0-5.9	0.5-1.0	.43	.43			
5010. Pits, sand and gravel													
5040. Udorthents													

Physical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
									Kw	Kf	T		
		In	Pct	g/cc	In/hr	In/in	Pct	Pct					
5080. Udorthents													
AW. Animal waste lagoon													
SL. Sewage lagoon													
W. Water													

Chemical Properties

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

Depth to the upper and lower boundaries of each layer is indicated.

Cation-exchange capacity is the total amount of extractable bases that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. Soils having a low cation-exchange capacity hold fewer cations and may require more frequent applications of fertilizer than soils having a high cation-exchange capacity. The ability to retain cations reduces the hazard of ground-water pollution.

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

Calcium carbonate equivalent is the percent of carbonates, by weight, in the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients is influenced by the amount of carbonates in the soil. Incorporating nitrogen fertilizer into calcareous soils helps to prevent nitrite accumulation and ammonium-N volatilization.

Chemical Properties of the Soils

(Absence of an entry indicates that data were not estimated)

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
1C:					
Ida	95	0-8	20-25	6.6-8.4	0-25
		8-60	20-25	7.4-8.4	5-30
1C3:					
Ida, severely eroded	80	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
1D3:					
Ida, severely eroded	80	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
1E3:					
Ida, severely eroded	70	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
1F3:					
Ida, severely eroded	70	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
8B:					
Judson	80	0-9	25-30	5.6-7.3	0
		9-28	25-30	5.6-7.3	0
		28-52	25-30	6.1-7.8	0-15
		52-60	25-30	6.1-7.8	0-15
8C:					
Judson	95	0-9	25-30	5.6-7.3	0
		9-28	25-30	5.6-7.3	0
		28-52	25-30	6.1-7.8	0-15
		52-60	25-30	6.1-7.8	0-15
9:					
Marshall	95	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0
9B:					
Marshall	100	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0
9B2:					
Marshall, moderately eroded	85	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
9C:					
Marshall	90	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
9C2:					
Marshall, moderately eroded	80	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
9D:					
Marshall	85	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0
9D2:					
Marshall, moderately eroded	70	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
9E2:					
Marshall, moderately eroded	70	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
9E3:					
Marshall, severely eroded	75	0-5	25-30	5.6-7.3	0
		5-46	25-30	5.6-7.3	0
		46-68	25-30	5.6-7.3	0
10B:					
Monona	100	0-8	25-30	5.6-7.3	0
		8-15	25-30	5.6-7.3	0
		15-30	25-30	6.1-7.3	0
		30-60	20-25	6.6-8.4	0-25
10B2:					
Monona, moderately eroded	80	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10C2:					
Monona, moderately eroded	75	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10D2:					
Monona, moderately eroded	60	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10D3:					
Monona, severely eroded	95	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
10E2:					
Monona, moderately eroded	50	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10E3:					
Monona, severely eroded	60	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10F2:					
Monona, moderately eroded	45	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
10F3:					
Monona, severely eroded	70	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
12B:					
Napier	85	0-8	20-25	6.1-7.3	0
		8-29	20-25	6.1-7.3	0
		29-48	20-25	6.1-8.4	0-10
		48-60	20-25	6.6-8.4	0-10
12C:					
Napier	95	0-8	20-25	6.1-7.3	0
		8-29	20-25	6.1-7.3	0
		29-48	20-25	6.1-8.4	0-10
		48-60	20-25	6.6-8.4	0-10
17B:					
Napier	50	0-8	20-25	6.1-7.3	0
		8-29	20-25	6.1-7.3	0
		29-48	20-25	6.1-8.4	0-10
		48-60	20-25	6.6-8.4	0-10
Kennebec, frequently flooded	20	0-8	30-36	5.6-7.3	0
		8-41	30-36	5.6-7.3	0
		41-54	30-36	6.1-7.3	0
		54-80	30-36	6.1-7.3	0
Nodaway, frequently flooded	15	0-7	20-25	6.1-7.3	0
		7-31	20-25	6.1-7.3	0
		31-42	20-25	6.1-7.3	0
		42-80	20-25	6.1-7.3	0
22D2:					
Dow, moderately eroded	90	0-6	20-25	6.6-8.4	0-25
		6-80	20-25	7.9-8.4	15-30

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
22D3:					
Dow, severely eroded	90	0-6	20-25	6.6-8.4	0-25
		6-80	20-25	7.9-8.4	15-30
22E3:					
Dow, severely eroded	80	0-6	20-25	6.6-8.4	0-25
		6-80	20-25	7.9-8.4	15-30
26:					
Kennebec, occasionally flooded	95	0-8	30-36	5.6-7.3	0
		8-41	30-36	5.6-7.3	0
		41-54	30-36	6.1-7.3	0
		54-80	30-36	6.1-7.3	0
35D2:					
Liston, moderately eroded	50	0-5	25-30	7.4-8.4	0-15
		5-38	22-27	7.4-8.4	5-20
		38-80	20-31	7.4-8.4	5-20
Burchard, moderately eroded	35	0-5	15-25	5.6-7.3	0
		5-13	15-25	6.1-7.3	0
		13-37	15-25	7.4-8.4	5-10
		37-80	10-20	7.4-8.4	1-15
35E2:					
Liston, moderately eroded	50	0-5	25-30	7.4-8.4	0-15
		5-38	22-27	7.4-8.4	5-20
		38-80	20-31	7.4-8.4	5-20
Burchard, moderately eroded	35	0-5	15-25	5.6-7.3	0
		5-13	15-25	6.1-7.3	0
		13-37	15-25	7.4-8.4	5-10
		37-80	10-20	7.4-8.4	1-15
35F2:					
Liston, moderately eroded	40	0-5	25-30	7.4-8.4	0-15
		5-38	22-27	7.4-8.4	5-20
		38-80	20-31	7.4-8.4	5-20
Burchard, moderately eroded	30	0-5	15-25	5.6-7.3	0
		5-13	15-25	6.1-7.3	0
		13-37	15-25	7.4-8.4	5-10
		37-80	10-20	7.4-8.4	1-15
35G:					
Liston	45	0-5	25-30	7.4-8.4	0-15
		5-38	22-27	7.4-8.4	5-20
		38-80	20-31	7.4-8.4	5-20
Burchard	35	0-11	15-25	5.6-7.3	0
		11-24	15-25	6.1-7.3	0
		24-36	15-25	7.4-8.4	5-10
		36-60	10-20	7.4-8.4	1-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
54:					
Zook, occasionally flooded	90	0-6	36-41	5.6-7.8	0
		6-20	36-41	5.6-7.3	0
		20-52	36-41	6.1-7.3	0
		52-60	30-36	6.1-7.3	0
54+:					
Zook, overwash, occasionally flooded	90	0-6	36-41	5.6-7.8	0
		6-20	36-41	5.6-7.3	0
		20-52	36-41	6.1-7.3	0
		52-60	30-36	6.1-7.3	0
59D2:					
Burchard, moderately eroded	55	0-5	15-25	5.6-7.3	0
		5-13	15-25	6.1-7.3	0
		13-37	15-25	7.4-8.4	5-10
		37-80	10-20	7.4-8.4	1-15
59E2:					
Burchard, moderately eroded	55	0-5	15-25	5.6-7.3	0
		5-13	15-25	6.1-7.3	0
		13-37	15-25	7.4-8.4	5-10
		37-80	10-20	7.4-8.4	1-15
99C2:					
Exira, moderately eroded	80	0-6	28-34	5.6-6.5	0
		6-40	28-34	5.6-6.5	0
		40-80	28-34	6.1-7.3	0
99D2:					
Exira, moderately eroded	50	0-6	28-34	5.6-6.5	0
		6-40	28-34	5.6-6.5	0
		40-80	28-34	6.1-7.3	0
99E2:					
Exira, moderately eroded	45	0-6	28-34	5.6-6.5	0
		6-40	28-34	5.6-6.5	0
		40-80	28-34	6.1-7.3	0
100B:					
Monona	75	0-7	25-30	5.6-7.3	0
		7-20	25-30	5.6-7.3	0
		20-48	25-30	6.1-7.3	0
		48-80	25-30	6.6-8.4	0-25
100C2:					
Monona, moderately eroded	50	0-6	25-30	5.6-7.3	0
		6-24	25-30	6.1-7.3	0
		24-80	25-30	6.6-8.4	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
100D2:					
Monona, moderately eroded	45	0-6	25-30	5.6-7.3	0
		6-24	25-30	6.1-7.3	0
		24-80	25-30	6.6-8.4	0-25
100D3:					
Monona, severely eroded	45	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-36	25-30	6.1-7.3	0
		36-80	20-25	6.6-8.4	0-25
100E2:					
Monona, moderately eroded	45	0-6	25-30	5.6-7.3	0
		6-24	25-30	6.1-7.3	0
		24-80	25-30	6.6-8.4	0-25
100E3:					
Monona, severely eroded	45	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-36	25-30	6.1-7.3	0
		36-80	20-25	6.6-8.4	0-25
100F2:					
Monona, moderately eroded	55	0-6	25-30	5.6-7.3	0
		6-24	25-30	6.1-7.3	0
		24-80	25-30	6.6-8.4	0-25
100F3:					
Monona, severely eroded	70	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-36	25-30	6.1-7.3	0
		36-80	20-25	6.6-8.4	0-25
111D3:					
Dow, severely eroded	55	0-6	20-25	6.6-8.4	0-25
		6-80	20-25	7.9-8.4	15-30
Monona, severely eroded	40	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-36	25-30	6.1-7.3	0
		36-80	20-25	6.6-8.4	0-25
111E3:					
Dow, severely eroded	55	0-6	20-25	6.6-8.4	0-25
		6-60	20-25	7.9-8.4	15-30
Monona, severely eroded	40	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-36	25-30	6.1-7.3	0
		36-80	20-25	6.6-8.4	0-25

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
125D3:					
Ida, severely eroded	50	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
Chute, severely eroded	30	0-4	5.0-10	7.6-8.4	0-20
		4-60	1.0-6.0	7.4-8.4	10-30
125E3:					
Ida, severely eroded	50	0-3	20-25	6.6-8.4	0-25
		3-80	20-25	7.4-8.4	5-30
Chute, severely eroded	30	0-4	5.0-10	7.6-8.4	0-20
		4-60	1.0-6.0	7.4-8.4	10-30
133:					
Colo, occasionally flooded	85	0-8	36-41	5.6-7.3	0
		8-34	36-41	5.6-7.3	0
		34-51	36-41	5.6-7.3	0
		51-60	30-36	6.1-7.3	0
133+:					
Colo, overwash, occasionally flooded	85	0-8	30-36	6.1-7.3	0
		8-34	36-41	5.6-7.3	0
		34-51	36-41	5.6-7.3	0
		51-60	30-36	6.1-7.3	0
212:					
Kennebec, occasionally flooded	70	0-8	30-36	5.6-7.3	0
		8-41	30-36	5.6-7.3	0
		41-54	30-36	6.1-7.3	0
		54-80	30-36	6.1-7.3	0
212+:					
Kennebec, overwash, occasionally flooded	90	0-8	30-36	5.6-7.3	0
		8-41	30-36	5.6-7.3	0
		41-54	30-36	6.1-7.3	0
		54-80	30-36	6.1-7.3	0
220:					
Nodaway, occasionally flooded	75	0-7	20-25	6.1-7.3	0
		7-31	20-25	6.1-7.3	0
		31-42	20-25	6.1-7.3	0
		42-80	20-25	6.1-7.3	0
266:					
Smithland, occasionally flooded	85	0-7	36-41	5.6-7.3	0
		7-34	36-41	5.6-7.3	0
		34-50	36-41	5.6-7.3	0
		50-60	30-36	6.1-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
266+:					
Smithland, overwash, occasionally flooded	75	0-8	36-41	5.6-7.3	0
		8-34	36-41	5.6-7.3	0
		34-50	36-41	5.6-7.3	0
		50-60	30-36	6.1-7.3	0
268D:					
Knox	85	0-7	10-18	5.6-7.3	0
		7-12	10-18	5.6-7.3	0
		12-61	12-22	5.6-7.3	0
		61-70	8.0-16	6.1-7.3	0
268E:					
Knox	80	0-7	10-18	5.6-7.3	0
		7-12	10-18	5.6-7.3	0
		12-61	12-22	5.6-7.3	0
		61-70	8.0-16	6.1-7.3	0
268F:					
Knox	75	0-7	10-18	5.6-7.3	0
		7-12	10-18	5.6-7.3	0
		12-61	12-22	5.6-7.3	0
		61-70	8.0-16	6.1-7.3	0
430:					
Ackmore, occasionally flooded	75	0-6	25-30	5.6-7.3	0
		6-25	25-30	5.6-7.3	0
		25-60	25-30	5.6-7.8	5-10
431B:					
Judson	55	0-9	25-30	5.6-7.3	0
		9-28	25-30	5.6-7.3	0
		28-52	25-30	6.1-7.8	0-15
		52-60	25-30	6.1-7.8	0-15
Ackmore, frequently flooded	25	0-6	25-30	5.6-7.3	0
		6-25	25-30	5.6-7.3	0
		25-60	25-30	5.6-7.8	5-10
Colo, overwash, frequently flooded	15	0-8	30-36	6.1-7.3	0
		8-34	36-41	5.6-7.3	0
		34-51	36-41	5.6-7.3	0
		51-60	30-36	6.1-7.3	0
509B:					
Marshall, terrace	90	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0
509C:					
Marshall, terrace	85	0-7	25-30	5.6-7.3	0
		7-22	25-30	5.6-7.3	0
		22-65	25-30	5.6-7.3	0
		65-80	20-25	6.6-7.3	0

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
509C2:					
Marshall, terrace, moderately eroded	65	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
509D2:					
Marshall, terrace, moderately eroded	65	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
509E2:					
Marshall, terrace, moderately eroded	65	0-7	25-30	5.6-7.3	0
		7-47	25-30	5.6-7.3	0
		47-80	25-30	5.6-7.3	0
510:					
Monona, terrace	100	0-8	25-30	5.6-7.3	0
		8-15	25-30	5.6-7.3	0
		15-30	25-30	6.1-7.3	0
		30-60	20-25	6.6-8.4	0-25
510B:					
Monona, terrace	60	0-8	25-30	5.6-7.3	0
		8-15	25-30	5.6-7.3	0
		15-30	25-30	6.1-7.3	0
		30-60	20-25	6.6-8.4	0-25
510C2:					
Monona, terrace, moderately eroded	75	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
510D2:					
Monona, terrace, moderately eroded	75	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
510E2:					
Monona, terrace, moderately eroded	75	0-7	25-30	5.6-7.3	0
		7-24	25-30	6.1-7.3	0
		24-60	20-25	6.6-8.4	0-25
630:					
Danbury, occasionally flooded	80	0-7	25-30	5.6-7.3	0
		7-32	25-30	5.6-7.3	0
		32-64	25-30	6.1-7.3	5-10
		64-80	25-30	5.6-7.3	5-10
670:					
Rawles, occasionally flooded	80	0-8	15-20	6.6-8.4	0-30
		8-26	15-20	6.6-8.4	0-30
		26-60	15-20	6.1-7.8	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
700:					
Monona, terrace------	100	0-6	25-30	5.6-7.3	0
		6-16	25-30	5.6-7.3	0
		16-49	25-30	6.1-7.3	0
		49-80	25-30	6.6-8.4	0-25
700B:					
Monona, terrace------	75	0-6	25-30	5.6-7.3	0
		6-16	25-30	5.6-7.3	0
		16-49	25-30	6.1-7.3	0
		49-80	25-30	6.6-8.4	0-25
700C2:					
Monona, terrace, moderately eroded---	50	0-6	25-30	5.6-7.3	0
		6-49	25-30	6.1-7.3	0
		49-80	25-30	6.6-8.4	0-25
700D2:					
Monona, terrace, moderately eroded---	60	0-6	25-30	5.6-7.3	0
		6-49	25-30	6.1-7.3	0
		49-80	25-30	6.6-8.4	0-25
717D:					
Napier----------	50	0-8	20-25	6.1-7.3	0
		8-29	20-25	6.1-7.3	0
		29-48	20-25	6.1-8.4	0-10
		48-60	20-25	6.6-8.4	0-10
Gullied land, frequently flooded--	35	---	---	---	---
740D:					
Hawick----------	90	0-7	1.0-10	6.1-7.8	0-10
		7-11	1.0-5.0	6.1-7.8	0-10
		11-80	1.0-5.0	7.4-8.4	5-15
740E:					
Hawick----------	90	0-7	1.0-10	6.1-7.8	0-10
		7-11	1.0-5.0	6.1-7.8	0-10
		11-80	1.0-5.0	7.4-8.4	5-15
740F:					
Hawick----------	90	0-7	1.0-10	6.1-7.8	0-10
		7-11	1.0-5.0	6.1-7.8	0-10
		11-80	1.0-5.0	7.4-8.4	5-15
980C:					
Judson----------	55	0-9	25-30	5.6-7.3	0
		9-28	25-30	5.6-7.3	0
		28-52	25-30	6.1-7.8	0-15
		52-60	25-30	6.1-7.8	0-15
Gullied land, frequently flooded--	35	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Pct. of map unit	Depth	Cation-exchange capacity	Soil reaction	Calcium carbonate
		In	meq/100 g	pH	Pct
1220:					
Nodaway, channeled, frequently flooded--	80	0-7	20-25	6.1-7.3	0
		7-31	20-25	6.1-7.3	0
		31-42	20-25	6.1-7.3	0
		42-80	20-25	6.1-7.3	0
5010.					
Pits, sand and gravel					
5040.					
Udorthents					
5080.					
Udorthents					
AW.					
Animal waste lagoon					
SL.					
Sewage lagoon					
W.					
Water					

Water Features

The table described in this section gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas.

Surface runoff refers to the loss of water from an area by flow over the land surface. Surface runoff classes are based on slope, climate, and vegetative cover. It is assumed that the surface of the soil is bare and that the retention of surface water resulting from irregularities in the ground surface is minimal. The classes are *negligible, very low, low, medium, high,* and *very high*.

The *months* in the table indicate the portion of the year in which the feature is most likely to be a concern.

Water table refers to a saturated zone in the soil. The table indicates, by month, depth to the top (*upper limit*) and base (*lower limit*) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table.

Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The table indicates *surface water depth* and the *duration* and *frequency* of ponding. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. *None* means that ponding is not probable; *rare* that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); *occasional* that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and *frequent* that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding is the temporary inundation of an area caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall

or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

Duration and *frequency* are estimated. Duration is expressed as *extremely brief* if 0.1 hour to 4 hours, *very brief* if 4 hours to 2 days, *brief* if 2 to 7 days, *long* if 7 to 30 days, and *very long* if more than 30 days. Frequency is expressed as none, very rare, rare, occasional, frequent, and very frequent. *None* means that flooding is not probable; *very rare* that it is very unlikely but possible under extremely unusual weather conditions (the chance of flooding is less than 1 percent in any year); *rare* that it is unlikely but possible under unusual weather conditions (the chance of flooding is 1 to 5 percent in any year); *occasional* that it occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year); *frequent* that it is likely to occur often under normal weather conditions (the chance of flooding is more than 50 percent in any year but is less than 50 percent in all months in any year); and *very frequent* that it is likely to occur very often under normal weather conditions (the chance of flooding is more than 50 percent in all months of any year).

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and little or no horizon development.

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

Water Features

(See text for definitions of terms used in this table. Estimates of the frequency of ponding and flooding apply to the whole year rather than to individual months. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1C:										
Ida	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
1C3:										
Ida, severely eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
1D3:										
Ida, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
1E3:										
Ida, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
1F3:										
Ida, severely eroded------	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
8B:										
Judson	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
8C:										
Judson	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9:										
Marshall	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
9B:										
Marshall	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9B2:										
Marshall, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9C:										
Marshall	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
9C2:										
Marshall, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9D:										
Marshall	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
9D2:										
Marshall, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
9E2:										
Marshall, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
9E3:										
Marshall, severely eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10B:										
Monona----------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10B2:										
Monona, moderately eroded	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
10C2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10D2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10D3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
10E2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10E3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
10F2:										
Monona, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
10F3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
12B:										
Napier----------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
12C:										
Napier----------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
17B:										
Napier	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Kennebec, frequently flooded	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Very brief	Frequent
			March	4.5-6.5	>6.0	---	---	None	Very brief	Frequent
			April	4.0-6.0	>6.0	---	---	None	Very brief	Frequent
			May	4.5-6.5	>6.0	---	---	None	Very brief	Frequent
			June	5.0-6.7	>6.0	---	---	None	Very brief	Frequent
			July	6.0-6.7	>6.0	---	---	None	Very brief	Frequent
			August	6.5-6.7	>6.0	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	6.5-6.7	>6.0	---	---	None	Very brief	Frequent
			November	5.5-6.7	>6.0	---	---	None	Very brief	Frequent
			December	6.0-6.7	>6.0	---	---	None	---	None
Nodaway, frequently flooded	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Very brief	Frequent
			March	4.5-6.5	>6.0	---	---	None	Very brief	Frequent
			April	4.0-6.0	>6.0	---	---	None	Very brief	Frequent
			May	4.5-6.5	>6.0	---	---	None	Very brief	Frequent
			June	5.0-6.7	>6.0	---	---	None	Very brief	Frequent
			July	6.0-6.7	>6.0	---	---	None	Very brief	Frequent
			August	6.5-6.7	>6.0	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	6.5-6.7	>6.0	---	---	None	Very brief	Frequent
			November	5.5-6.7	>6.0	---	---	None	Very brief	Frequent
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
22D2:										
Dow, moderately eroded----	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
22D3:										
Dow, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
22E3:										
Dow, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
26:										
Kennebec, occasionally flooded	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			September	---	---	---	---	None	Brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None
35D2:										
Liston, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Burchard, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
35E2:										
Liston, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Burchard, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
35F2:										
Liston, moderately eroded	B	Very high								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
35F2:										
Burchard, moderately eroded	B	Very high								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
35G:										
Liston	B	Very high								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Burchard	B	Very high								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
54:										
Zook, occasionally flooded	C/D	Medium								
			January	2.0-3.5	>6.0	---	---	None	---	None
			February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
			May	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
			July	2.0-3.5	>6.0	---	---	None	Brief	Occasional
			August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
			October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	---	None
54+:										
Zook, overwash, occasionally flooded-----	C/D	Medium								
			January	2.0-3.5	>6.0	---	---	None	---	None
			February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
			May	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
			July	2.0-3.5	>6.0	---	---	None	Brief	Occasional
			August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
			October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	---	None
59D2:										
Burchard, moderately eroded-------------------	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
59E2:										
Burchard, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
99C2:										
Exira, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
99D2:										
Exira, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
99E2:										
Exira, moderately eroded--	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100B:										
Monona----------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100C2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
100D2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100D3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100E2:										
Monona, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
100E3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100F2:										
Monona, moderately eroded	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
100F3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
111D3:										
Dow, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
111E3:										
Dow, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
111E3:										
Monona, severely eroded---	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
125D3:										
Ida, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Chute, severely eroded----	A	Very low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
125E3:										
Ida, severely eroded------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Chute, severely eroded----	A	Very low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
133:										
Colo, occasionally flooded	B/D	Low								
			January	2.0-3.5	>6.0	---	---	None	---	None
			February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
			May	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
			July	2.0-3.5	>6.0	---	---	None	Brief	Occasional
			August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
			October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
133+:										
Colo, overwash, occasionally flooded-----	B/D	Low								
			January	2.0-3.5	>6.0	---	---	None	---	None
			February	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			March	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			April	0.0-1.0	>6.0	---	---	None	Brief	Occasional
			May	0.5-2.0	>6.0	---	---	None	Brief	Occasional
			June	1.0-2.0	>6.0	---	---	None	Brief	Occasional
			July	2.0-3.5	>6.0	---	---	None	Brief	Occasional
			August	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			September	3.0-4.0	>6.0	---	---	None	Brief	Occasional
			October	2.5-3.5	>6.0	---	---	None	Brief	Occasional
			November	1.5-3.0	>6.0	---	---	None	Brief	Occasional
			December	2.0-3.5	>6.0	---	---	None	---	None
212:										
Kennebec, occasionally flooded------------------	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			September	---	---	---	---	None	Brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
212+:										
Kennebec, overwash, occasionally flooded-----	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			September	---	---	---	---	None	Brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None
220:										
Nodaway, occasionally flooded------------------	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			September	---	---	---	---	None	Brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
266:										
Smithland, occasionally flooded	B/D	Low								
			January	3.0-5.5	>6.0	---	---	None	---	None
			February	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			March	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			April	1.0-3.5	>6.0	---	---	None	Brief	Occasional
			May	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			June	2.0-4.5	>6.0	---	---	None	Brief	Occasional
			July	3.0-5.5	>6.0	---	---	None	Brief	Occasional
			August	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			September	4.0-6.5	>6.0	---	---	None	Brief	Occasional
			October	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			November	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			December	3.0-5.5	>6.0	---	---	None	---	None
266+:										
Smithland, overwash, occasionally flooded	B/D	Low								
			January	3.0-5.5	>6.0	---	---	None	---	None
			February	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			March	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			April	1.0-3.5	>6.0	---	---	None	Brief	Occasional
			May	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			June	2.0-4.5	>6.0	---	---	None	Brief	Occasional
			July	3.0-5.5	>6.0	---	---	None	Brief	Occasional
			August	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			September	4.0-6.5	>6.0	---	---	None	Brief	Occasional
			October	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			November	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			December	3.0-5.5	>6.0	---	---	None	---	None
268D:										
Knox	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
268E:										
Knox	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
268F:										
Knox	B	High								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
430:										
Ackmore, occasionally flooded	B	Low								
			January	3.0-5.5	>6.0	---	---	None	---	None
			February	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			March	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			April	1.0-3.5	>6.0	---	---	None	Brief	Occasional
			May	1.5-4.0	>6.0	---	---	None	Brief	Occasional
			June	2.0-4.5	>6.0	---	---	None	Brief	Occasional
			July	3.0-5.5	>6.0	---	---	None	Brief	Occasional
			August	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			September	4.0-6.5	>6.0	---	---	None	Brief	Occasional
			October	3.5-6.0	>6.0	---	---	None	Brief	Occasional
			November	2.5-5.0	>6.0	---	---	None	Brief	Occasional
			December	3.0-5.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
431B:										
Judson	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Ackmore, frequently flooded	B	Low								
			January	3.0-5.5	>6.0	---	---	None	---	None
			February	2.5-5.0	>6.0	---	---	None	Very brief	Frequent
			March	1.5-4.0	>6.0	---	---	None	Very brief	Frequent
			April	1.0-3.5	>6.0	---	---	None	Very brief	Frequent
			May	1.5-4.0	>6.0	---	---	None	Very brief	Frequent
			June	2.0-4.5	>6.0	---	---	None	Very brief	Frequent
			July	3.0-5.5	>6.0	---	---	None	Very brief	Frequent
			August	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			September	4.0-6.5	>6.0	---	---	None	Very brief	Frequent
			October	3.5-6.0	>6.0	---	---	None	Very brief	Frequent
			November	2.5-5.0	>6.0	---	---	None	Very brief	Frequent
			December	3.0-5.5	>6.0	---	---	None	---	None
Colo, overwash, frequently flooded	B/D	Low								
			January	2.0-3.5	>6.0	---	---	None	---	None
			February	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
			March	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
			April	0.0-1.0	>6.0	---	---	None	Very brief	Frequent
			May	0.5-2.0	>6.0	---	---	None	Very brief	Frequent
			June	1.0-2.0	>6.0	---	---	None	Very brief	Frequent
			July	2.0-3.5	>6.0	---	---	None	Very brief	Frequent
			August	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
			September	3.0-4.0	>6.0	---	---	None	Very brief	Frequent
			October	2.5-3.5	>6.0	---	---	None	Very brief	Frequent
			November	1.5-3.0	>6.0	---	---	None	Very brief	Frequent
			December	2.0-3.5	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
509B:										
Marshall, terrace---------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
509C:										
Marshall, terrace---------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
509C2:										
Marshall, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
509D2:										
Marshall, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
509E2:										
Marshall, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
510:										
Monona, terrace	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
510B:										
Monona, terrace	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
510C2:										
Monona, terrace, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
510D2:										
Monona, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
510E2:										
Monona, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
630:										
Danbury, occasionally flooded	B	Low								
			January	4.0-6.0	>6.0	---	---	None	---	None
			February	3.5-5.5	>6.0	---	---	None	Brief	Occasional
			March	2.5-4.5	>6.0	---	---	None	Brief	Occasional
			April	2.0-4.0	>6.0	---	---	None	Brief	Occasional
			May	2.5-4.5	>6.0	---	---	None	Brief	Occasional
			June	3.0-5.0	>6.0	---	---	None	Brief	Occasional
			July	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			August	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			September	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			October	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			November	3.5-5.5	>6.0	---	---	None	Brief	Occasional
			December	4.0-6.0	>6.0	---	---	None	---	None
670:										
Rawles, occasionally flooded	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			March	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			April	4.0-6.0	>6.0	---	---	None	Brief	Occasional
			May	4.5-6.5	>6.0	---	---	None	Brief	Occasional
			June	5.0-6.7	>6.0	---	---	None	Brief	Occasional
			July	6.0-6.7	>6.0	---	---	None	Brief	Occasional
			August	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			September	---	---	---	---	None	Brief	Occasional
			October	6.5-6.7	>6.0	---	---	None	Brief	Occasional
			November	5.5-6.7	>6.0	---	---	None	Brief	Occasional
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
700:										
Monona, terrace----------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
700B:										
Monona, terrace----------	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
700C2:										
Monona, terrace, moderately eroded--------	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
700D2:										
Monona, terrace, moderately eroded	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
717D:										
Napier	B	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Gullied land, frequently flooded	---	---								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	Very brief	Frequent
			March	---	---	---	---	None	Very brief	Frequent
			April	---	---	---	---	None	Very brief	Frequent
			May	---	---	---	---	None	Very brief	Frequent
			June	---	---	---	---	None	Very brief	Frequent
			July	---	---	---	---	None	Very brief	Frequent
			August	---	---	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	---	---	---	---	None	Very brief	Frequent
			November	---	---	---	---	None	Very brief	Frequent
			December	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
740D:										
Hawick	A	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
740E:										
Hawick	A	Low								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
740F:										
Hawick	A	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
980C:										
Judson	B	Medium								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	---	None
			March	---	---	---	---	None	---	None
			April	---	---	---	---	None	---	None
			May	---	---	---	---	None	---	None
			June	---	---	---	---	None	---	None
			July	---	---	---	---	None	---	None
			August	---	---	---	---	None	---	None
			September	---	---	---	---	None	---	None
			October	---	---	---	---	None	---	None
			November	---	---	---	---	None	---	None
			December	---	---	---	---	None	---	None
Gullied land, frequently flooded	---	---								
			January	---	---	---	---	None	---	None
			February	---	---	---	---	None	Very brief	Frequent
			March	---	---	---	---	None	Very brief	Frequent
			April	---	---	---	---	None	Very brief	Frequent
			May	---	---	---	---	None	Very brief	Frequent
			June	---	---	---	---	None	Very brief	Frequent
			July	---	---	---	---	None	Very brief	Frequent
			August	---	---	---	---	None	Very brief	Frequent
			September	---	---	---	---	None	Very brief	Frequent
			October	---	---	---	---	None	Very brief	Frequent
			November	---	---	---	---	None	Very brief	Frequent
			December	---	---	---	---	None	---	None
1220:										
Nodaway, channeled, frequently flooded	B	Low								
			January	6.0-6.7	>6.0	---	---	None	---	None
			February	5.5-6.7	>6.0	---	---	None	Brief	Frequent
			March	4.5-6.5	>6.0	---	---	None	Brief	Frequent
			April	4.0-6.0	>6.0	---	---	None	Brief	Frequent
			May	4.5-6.5	>6.0	---	---	None	Brief	Frequent
			June	5.0-6.7	>6.0	---	---	None	Brief	Frequent
			July	6.0-6.7	>6.0	---	---	None	Brief	Frequent
			August	6.5-6.7	>6.0	---	---	None	Brief	Frequent
			September	---	---	---	---	None	Brief	Frequent
			October	6.5-6.7	>6.0	---	---	None	Brief	Frequent
			November	5.5-6.7	>6.0	---	---	None	Brief	Frequent
			December	6.0-6.7	>6.0	---	---	None	---	None

Water Features--Continued

Map symbol and soil name	Hydrologic group	Surface runoff	Months	Water table		Ponding			Flooding	
				Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
				Ft	Ft	Ft				
5010. Pits, sand and gravel										
5040. Udorthents										
5080. Udorthents										
AW. Animal waste lagoon										
SL. Sewage lagoon										
W. Water										

Soil Features

The table described in this section gives estimates of various soil features. The estimates are used in land use planning that involves engineering considerations.

Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty and highly structured, clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

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

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

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

Soil Features

(See text for definitions of terms used in this table. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
1C:			
Ida	High	Low	Low
1C3:			
Ida, severely eroded	High	Low	Low
1D3:			
Ida, severely eroded	High	Low	Low
1E3:			
Ida, severely eroded	High	Low	Low
1F3:			
Ida, severely eroded	High	Low	Low
8B:			
Judson	High	Moderate	Low
8C:			
Judson	High	Moderate	Low
9:			
Marshall	High	Moderate	Moderate
9B:			
Marshall	High	Moderate	Moderate
9B2:			
Marshall, moderately eroded	High	Moderate	Moderate
9C:			
Marshall	High	Moderate	Moderate
9C2:			
Marshall, moderately eroded	High	Moderate	Moderate
9D:			
Marshall	High	Moderate	Moderate
9D2:			
Marshall, moderately eroded	High	Moderate	Moderate
9E2:			
Marshall, moderately eroded	High	Moderate	Moderate
9E3:			
Marshall, severely eroded	High	Moderate	Moderate
10B:			
Monona	High	Low	Low

Soil Features--Continued

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
10B2:			
Monona, moderately eroded	High	Low	Low
10C2:			
Monona, moderately eroded	High	Low	Low
10D2:			
Monona, moderately eroded	High	Low	Low
10D3:			
Monona, severely eroded	High	Low	Low
10E2:			
Monona, moderately eroded	High	Low	Low
10E3:			
Monona, severely eroded	High	Low	Low
10F2:			
Monona, moderately eroded	High	Low	Low
10F3:			
Monona, severely eroded	High	Low	Low
12B:			
Napier	High	Low	Low
12C:			
Napier	High	Low	Low
17B:			
Napier	High	Low	Low
Kennebec, frequently flooded	High	Moderate	Low
Nodaway, frequently flooded	High	Moderate	Low
22D2:			
Dow, moderately eroded	High	Low	Low
22D3:			
Dow, severely eroded	High	Low	Low
22E3:			
Dow, severely eroded	High	Low	Low
26:			
Kennebec, occasionally flooded	High	Low	Moderate
35D2:			
Liston, moderately eroded	Moderate	High	Low
Burchard, moderately eroded	Moderate	Moderate	Low

Soil Features--Continued

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
35E2:			
Liston, moderately eroded	Moderate	High	Low
Burchard, moderately eroded	Moderate	Moderate	Low
35F2:			
Liston, moderately eroded	Moderate	High	Low
Burchard, moderately eroded	Moderate	Moderate	Low
35G:			
Liston	Moderate	High	Low
Burchard	Moderate	Moderate	Moderate
54:			
Zook, occasionally flooded	High	High	Moderate
54+:			
Zook, overwash, occasionally flooded	High	High	Moderate
59D2:			
Burchard, moderately eroded	Moderate	Moderate	Low
59E2:			
Burchard, moderately eroded	Moderate	Moderate	Low
99C2:			
Exira, moderately eroded	High	Moderate	Moderate
99D2:			
Exira, moderately eroded	High	Moderate	Moderate
99E2:			
Exira, moderately eroded	High	Moderate	Moderate
100B:			
Monona	High	Low	Low
100C2:			
Monona, moderately eroded	High	Low	Low
100D2:			
Monona, moderately eroded	High	Low	Low
100D3:			
Monona, severely eroded	High	Low	Low

Soil Features--Continued

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
100E2:			
Monona, moderately eroded	High	Low	Low
100E3:			
Monona, severely eroded	High	Low	Low
100F2:			
Monona, moderately eroded	High	Low	Low
100F3:			
Monona, severely eroded	High	Low	Low
111D3:			
Dow, severely eroded	High	Low	Low
Monona, severely eroded	High	Low	Low
111E3:			
Dow, severely eroded	High	Low	Low
Monona, severely eroded	High	Low	Low
125D3:			
Ida, severely eroded	High	Low	Low
Chute, severely eroded	Low	Low	Low
125E3:			
Ida, severely eroded	High	Low	Low
Chute, severely eroded	Low	Low	Low
133:			
Colo, occasionally flooded	High	High	Moderate
133+:			
Colo, overwash, occasionally flooded	High	High	Moderate
212:			
Kennebec, occasionally flooded	High	Moderate	Low
212+:			
Kennebec, overwash, occasionally flooded	High	Moderate	Low
220:			
Nodaway, occasionally flooded	High	Moderate	Low
266:			
Smithland, occasionally flooded	High	High	Moderate
266+:			
Smithland, overwash, occasionally flooded	High	High	Moderate

Soil Features--Continued

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
268D:			
Knox	High	Low	Low
268E:			
Knox	High	Low	Low
268F:			
Knox	High	Low	Low
430:			
Ackmore, occasionally flooded	High	High	Low
431B:			
Judson	High	Moderate	Low
Ackmore, frequently flooded	High	High	Low
Colo, overwash, frequently flooded	High	High	Moderate
509B:			
Marshall, terrace	High	Moderate	Moderate
509C:			
Marshall, terrace	High	Moderate	Moderate
509C2:			
Marshall, terrace, moderately eroded	High	Moderate	Moderate
509D2:			
Marshall, terrace, moderately eroded	High	Moderate	Moderate
509E2:			
Marshall, terrace, moderately eroded	High	Moderate	Moderate
510:			
Monona, terrace	High	Low	Low
510B:			
Monona, terrace	High	Low	Low
510C2:			
Monona, terrace, moderately eroded	High	Low	Low
510D2:			
Monona, terrace, moderately eroded	High	Low	Low
510E2:			
Monona, terrace, moderately eroded	High	Low	Low
630:			
Danbury, occasionally flooded	High	High	Low

Soil Features--Continued

Map symbol and soil name	Potential for frost action	Risk of corrosion	
		Uncoated steel	Concrete
670:			
Rawles, occasionally flooded	High	Moderate	Low
700:			
Monona, terrace	High	Low	Low
700B:			
Monona, terrace	High	Low	Low
700C2:			
Monona, terrace, moderately eroded	High	Low	Low
700D2:			
Monona, terrace, moderately eroded	High	Low	Low
717D:			
Napier	High	Low	Low
Gullied land, frequently flooded.			
740D:			
Hawick	Low	Low	Low
740E:			
Hawick	Low	Low	Low
740F:			
Hawick	Low	Low	Low
980C:			
Judson	High	Moderate	Low
Gullied land, frequently flooded.			
1220:			
Nodaway, channeled, frequently flooded	High	Moderate	Low
5010.			
Pits, sand and gravel			
5040.			
Udorthents			
5080.			
Udorthents			
AW.			
Animal waste lagoon			
SL.			
Sewage lagoon			
W.			
Water			

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