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Natural
Resources
Conservation
Service

In cooperation with
the Research Division,
College of Agricultural and
Life Sciences, University of
Wisconsin

Soil Survey of Pepin County, Wisconsin

Subset of MLRA 105

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 associated soils called general soil map units. 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 map units in the area on the color-coded map legend, then refer to the section **General Soil Map Units** in Part I of this survey 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**. 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. Turn to the **Contents** in Part I of this survey, which lists the map units and shows the page where each map unit is described.

The **Contents** in Part II shows which table has data on a specific land use 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 1996. Soil names and descriptions were approved in 1997. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1997. This survey was made cooperatively by the Natural Resources Conservation Service and the Research Division of the College of Agricultural and Life Sciences, University of Wisconsin. It is part of the technical assistance furnished to the Pepin County Land Conservation Department, which helped finance the fieldwork.

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.

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Cover: *Upper left*—Dead Lake Prairie is a prime agricultural area. It is bordered on the east by Silver Birch Lake and the Chippewa River flood plain. *Upper right*—An area of Urne soils. Maintaining a permanent cover, including mixed conifer plantings, is a requirement in highly erodible areas enrolled in the Conservation Reserve Program. *Lower left*—Lake Pepin, a natural widening of the Mississippi River, offers many miles of open water for sailing and fishing enthusiasts. *Lower right*—Water erosion can be a major concern in many areas because of the slope, the climate, erodible soil textures, and the cropping requirements for dairy farming.

Additional information about the Nation's natural resources is available on the Natural Resources Conservation Service home page on the World Wide Web. The address is <http://www.nrcs.usda.gov> (click on "Technical Resources").

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Soil Survey of Pepin County, Wisconsin, Subset of Major Land Resource Area 105—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.

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

Interpretive ratings help engineers, planners, and others understand how soil properties influence important nonagricultural uses, such as building site development and construction materials. The ratings indicate the most restrictive soil features affecting the suitability of the soils for these uses.

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 sand and gravel, 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 classification and extent of the soils in this survey area are shown in the tables "Classification of the Soils" and "Acreage and Proportionate Extent of the Soils," which are at the end of this section.

Classification of the Soils

Soil name	Family or higher taxonomic class
Aldo-----	Mixed, mesic Typic Udipsamments
Alganssee-----	Mixed, mesic Aquic Udipsamments
Arenzville-----	Coarse-silty, mixed, superactive, nonacid, mesic Typic Udifluvents
Bearpen-----	Fine-silty, mixed, superactive, mesic Aquic Argiudolls
Bellechester-----	Sandy, mixed, mesic Entic Hapludolls
Boguscreek-----	Coarse-silty, mixed, superactive, nonacid, mesic Mollic Udifluvents
Boone-----	Mesic, uncoated Typic Quartzipsamments
Boplain-----	Mixed, mesic Typic Udipsamments
Brodale-----	Loamy-skeletal, carbonatic, mesic Entic Hapludolls
Burkhardt-----	Sandy, mixed, mesic Typic Hapludolls
Chaseburg-----	Coarse-silty, mixed, superactive, nonacid, mesic Typic Udifluvents
Chelsea-----	Mixed, mesic Argic Udipsamments
Churchtown-----	Fine-silty, mixed, superactive, mesic Mollic Hapludalfts
Dakota-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Argiudolls
Dorerton-----	Loamy-skeletal, mixed, active, mesic Typic Hapludalfts
Drammen-----	Sandy, mixed, mesic Lamellic Hapludalfts
Dunnbot-----	Coarse-loamy, mixed, superactive, nonacid, mesic Mollic Udifluvents
Elbaville-----	Fine-loamy, mixed, superactive, mesic Glossoboric Hapludalfts
Elevasail-----	Coarse-loamy, siliceous, active, mesic Ultic Hapludalfts
Ella-----	Fine-silty, mixed, superactive, mesic Mollic Hapludalfts
Ettrick-----	Fine-silty, mixed, superactive, mesic Fluvaquentic Endoaquolls
Farrington-----	Sandy, mixed, mesic Aquic Hapludolls
Finchford-----	Sandy, mixed, mesic Entic Hapludolls
Forkhorn-----	Coarse-loamy, mixed, active, mesic Mollic Hapludalfts
Gaphill-----	Coarse-loamy, siliceous, active, mesic Typic Hapludalfts
Garne-----	Sandy over loamy, mixed, active, mesic Typic Hapludolls
Hersey-----	Fine-silty, mixed, superactive, mesic Mollic Hapludalfts
Hixton-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Typic Hapludalfts
Hoopeston-----	Coarse-loamy, mixed, superactive, mesic Aquic Hapludolls
Houghton-----	Euic, mesic Typic Medisaprists
Kalmarville-----	Coarse-loamy, mixed, superactive, nonacid, mesic Mollic Fluvaquents
Kevilar-----	Coarse-loamy, mixed, active, mesic Mollic Hapludalfts
Komro-----	Sandy, mixed, mesic Entic Hapludolls
Lows-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, nonacid, frigid Mollic Endoaquepts
Markey-----	Sandy or sandy-skeletal, mixed, euic Terric Borosaprists
Medary-----	Fine, mixed, superactive, mesic Oxyaquic Hapludalfts
Meridian-----	Fine-loamy over sandy or sandy-skeletal, mixed, superactive, mesic Mollic Hapludalfts
Mt. Carroll-----	Fine-silty, mixed, superactive, mesic Mollic Hapludalfts
NewGlarus-----	Fine-silty over clayey, mixed, superactive, mesic Typic Hapludalfts
Newson-----	Mixed, frigid Humaqueptic Psammaquents
Norden-----	Fine-loamy, mixed, superactive, mesic Typic Hapludalfts
Northbend-----	Coarse-loamy over sandy or sandy-skeletal, mixed, active, mesic Fluvaquentic Dystrichrepts
Orion-----	Coarse-silty, mixed, superactive, nonacid, mesic Aquic Udifluvents
Palms-----	Loamy, mixed, euic, mesic Terric Medisaprists
Pepin-----	Fine-silty, mixed, superactive, mesic Typic Hapludalfts
Plainfield-----	Mixed, mesic Typic Udipsamments
Plumcreek-----	Fine-loamy, mixed, superactive, mesic Typic Hapludalfts
Prissel-----	Loamy, mixed, active, mesic Arenic Hapludalfts
Rasset-----	Coarse-loamy, mixed, superactive, mesic Typic Argiudolls
Rockbluff-----	Mesic, coated Typic Quartzipsamments
Rusktown-----	Coarse-loamy, mixed, active, mesic Mollic Hapludalfts
Scotah-----	Mixed, mesic Typic Udipsamments
Seaton-----	Fine-silty, mixed, superactive, mesic Typic Hapludalfts
Seelyeville-----	Euic Typic Borosaprists
Tarr-----	Mesic, uncoated Typic Quartzipsamments
Tint-----	Mesic, uncoated Typic Quartzipsamments
Udipsamments-----	Udipsamments
Urne-----	Coarse-loamy, mixed, active, mesic Dystric Eutrochrepts

Acreage and Proportionate Extent of the Soils

Map symbol	Soil name	Acres	Percent
11A	Markey muck, flooded, 0 to 1 percent slopes-----	564	0.4
20A	Palms and Houghton mucks, 0 to 1 percent slopes-----	256	0.2
21A	Palms muck, flooded, 0 to 1 percent slopes-----	78	*
40A	Markey and Seelyville mucks, 0 to 1 percent slopes-----	2,828	1.8
114B2	Mt. Carroll silt loam, 2 to 6 percent slopes, eroded-----	581	0.4
114C2	Mt. Carroll silt loam, 6 to 12 percent slopes, eroded-----	556	0.3
115B2	Seaton silt loam, 2 to 6 percent slopes, eroded-----	1,806	1.1
115C2	Seaton silt loam, 6 to 12 percent slopes, eroded-----	5,481	3.4
115D2	Seaton silt loam, 12 to 20 percent slopes, eroded-----	4,299	2.7
116C2	Churchtown silt loam, 6 to 12 percent slopes, eroded-----	465	0.3
116D2	Churchtown silt loam, 12 to 20 percent slopes, eroded-----	3,046	1.9
116E	Churchtown silt loam, 20 to 30 percent slopes-----	3,868	2.4
125B2	Pepin silt loam, 2 to 6 percent slopes, eroded-----	2,013	1.3
125C2	Pepin silt loam, 6 to 12 percent slopes, eroded-----	8,195	5.2
125D2	Pepin silt loam, 12 to 20 percent slopes, eroded-----	4,463	2.8
125E2	Pepin silt loam, 20 to 30 percent slopes, eroded-----	283	0.2
144B2	NewGlarus silt loam, 2 to 6 percent slopes, eroded-----	156	0.1
144C2	NewGlarus silt loam, 6 to 12 percent slopes, eroded-----	1,183	0.7
144D2	NewGlarus silt loam, 12 to 20 percent slopes, eroded-----	1,840	1.2
144E	NewGlarus silt loam, 20 to 30 percent slopes-----	585	0.4
213C2	Hixton silt loam, 6 to 12 percent slopes, eroded-----	60	*
213D2	Hixton silt loam, 12 to 20 percent slopes, eroded-----	136	0.1
213E2	Hixton silt loam, 20 to 30 percent slopes, eroded-----	351	0.2
224B	Elevasil sandy loam, 2 to 6 percent slopes-----	68	*
224C2	Elevasil sandy loam, 6 to 12 percent slopes, eroded-----	68	*
224D2	Elevasil sandy loam, 12 to 20 percent slopes, eroded-----	62	*
233C	Boone sand, 6 to 15 percent slopes-----	721	0.5
254B2	Norden silt loam, 2 to 6 percent slopes, eroded-----	175	0.1
254C2	Norden silt loam, 6 to 12 percent slopes, eroded-----	377	0.2
254D2	Norden silt loam, 12 to 20 percent slopes, eroded-----	1,004	0.6
254E2	Norden silt loam, 20 to 30 percent slopes, eroded-----	3,800	2.4
254F	Norden silt loam, 30 to 45 percent slopes-----	384	0.2
255B2	Urne fine sandy loam, 2 to 6 percent slopes, eroded-----	1,062	0.7
255C2	Urne fine sandy loam, 6 to 12 percent slopes, eroded-----	1,806	1.1
255D2	Urne fine sandy loam, 12 to 20 percent slopes, eroded-----	3,121	2.0
255E	Urne fine sandy loam, 20 to 30 percent slopes-----	761	0.5
255F	Urne fine sandy loam, 30 to 45 percent slopes-----	3,158	2.0
265B	Garne loamy sand, 2 to 6 percent slopes-----	539	0.3
265C	Garne loamy sand, 6 to 12 percent slopes-----	753	0.5
303A	Boguscreek silt loam, 0 to 3 percent slopes-----	104	0.1
313D2	Plumcreek silt loam, 12 to 20 percent slopes, eroded-----	88	0.1
313F	Plumcreek silt loam, 20 to 45 percent slopes-----	2,604	1.6
316B2	Ella silt loam, 1 to 6 percent slopes, eroded-----	7,076	4.5
316C2	Ella silt loam, 6 to 12 percent slopes, eroded-----	497	0.3
318A	Bearpen silt loam, 0 to 3 percent slopes-----	1,562	1.0
326B2	Medary silt loam, 1 to 6 percent slopes, eroded-----	96	0.1
403A	Dakota silt loam, 0 to 3 percent slopes-----	107	0.1
413A	Rasset sandy loam, 0 to 3 percent slopes-----	302	0.2
413B	Rasset sandy loam, 2 to 6 percent slopes-----	37	*
423A	Meridian silt loam, 0 to 3 percent slopes-----	752	0.5
423B2	Meridian silt loam, 2 to 6 percent slopes, eroded-----	502	0.3
429A	Lows loam, 0 to 2 percent slopes-----	233	0.1
432A	Kevilar sandy loam, 0 to 3 percent slopes-----	507	0.3
432B	Kevilar sandy loam, 2 to 6 percent slopes-----	318	0.2
432C2	Kevilar sandy loam, 6 to 12 percent slopes, eroded-----	67	*
433A	Forkhorn sandy loam, 0 to 3 percent slopes-----	181	0.1
433B	Forkhorn sandy loam, 2 to 6 percent slopes-----	126	0.1
433C2	Forkhorn sandy loam, 6 to 12 percent slopes, eroded-----	86	0.1
436A	Rusktown sandy loam, 0 to 3 percent slopes-----	25	*
438A	Hoopeston sandy loam, 0 to 3 percent slopes-----	404	0.3
453A	Burkhardt sandy loam, 0 to 3 percent slopes-----	3,514	2.2
453B	Burkhardt sandy loam, 2 to 6 percent slopes-----	382	0.2

See footnote at end of table.

Acreage and Proportionate Extent of the Soils--Continued

Map symbol	Soil name	Acres	Percent
501A	Finchford loamy sand, 0 to 3 percent slopes-----	3,007	1.9
501B	Finchford loamy sand, 2 to 6 percent slopes-----	3,237	2.0
502B2	Chelsea fine sand, 2 to 6 percent slopes, eroded-----	1,781	1.1
502C2	Chelsea fine sand, 6 to 15 percent slopes, eroded-----	546	0.3
506A	Komro loamy sand, 0 to 3 percent slopes-----	1,419	0.9
508A	Farrington loamy sand, 0 to 3 percent slopes-----	2,472	1.6
510B	Boplain sand, 0 to 6 percent slopes-----	202	0.1
510C	Boplain sand, 6 to 15 percent slopes-----	17	*
510F	Boplain sand, 15 to 60 percent slopes-----	41	*
511A	Plainfield sand, 0 to 3 percent slopes-----	663	0.4
511B	Plainfield sand, 2 to 6 percent slopes-----	832	0.5
511C	Plainfield sand, 6 to 15 percent slopes-----	758	0.5
511F	Plainfield sand, 15 to 60 percent slopes-----	2,206	1.4
512B	Drammen loamy sand, 1 to 6 percent slopes-----	4,673	2.9
512C	Drammen loamy sand, 6 to 12 percent slopes-----	2,520	1.6
512D	Drammen loamy sand, 12 to 20 percent slopes-----	333	0.2
516A	Aldo sand, 0 to 3 percent slopes-----	1,518	1.0
546A	Prissel loamy sand, 0 to 3 percent slopes-----	751	0.5
546B	Prissel loamy sand, 2 to 6 percent slopes-----	212	0.1
546F	Prissel loamy sand, 15 to 60 percent slopes-----	264	0.2
561B	Tarr sand, 1 to 6 percent slopes-----	84	0.1
566A	Tint sand, 0 to 3 percent slopes-----	92	0.1
589A	Newson mucky loamy sand, 0 to 2 percent slopes-----	1,358	0.9
616B	Chaseburg silt loam, 1 to 4 percent slopes-----	2,359	1.5
626A	Arenzville silt loam, 0 to 3 percent slopes-----	1,695	1.1
628A	Orion silt loam, 0 to 3 percent slopes-----	2,157	1.4
629A	Ettrick silt loam, 0 to 2 percent slopes-----	1,031	0.6
646A	Dunnbot fine sandy loam, 0 to 3 percent slopes-----	319	0.2
656A	Scotah loamy fine sand, 0 to 3 percent slopes-----	1,060	0.7
826B2	Hersey silt loam, 2 to 6 percent slopes, eroded-----	3,027	1.9
826C2	Hersey silt loam, 6 to 12 percent slopes, eroded-----	134	0.1
1135F	Dorerton-Elbaville complex, 30 to 60 percent slopes-----	10,979	6.9
1145F	Gaphill-Rockbluff complex, 30 to 60 percent slopes-----	5,495	3.5
1155F	Brodale-Bellechester-Rock outcrop complex, 60 to 90 percent slopes-----	712	0.4
1224F	Boone-Elevasil complex, 15 to 50 percent slopes-----	351	0.2
1648A	Northbend-Ettrick silt loams, 0 to 3 percent slopes-----	2,878	1.8
1658A	Algansee-Kalmarville complex, 0 to 3 percent slopes-----	6,137	3.9
2003A	Riverwash, nearly level-----	193	0.1
2013	Pits, gravel-----	76	*
2014	Pits, quarry, hard bedrock-----	98	0.1
2040	Udipsamments, dredge material-----	12	*
2050	Landfill-----	17	*
W	Water-----	10,679	6.7
M-W	Miscellaneous water-----	8	*
	Total-----	158,925	100.0

* Less than 0.1 percent.

Agronomy

General management needed for crops and for hay and pasture is suggested in this section. The system of land capability classification used by the Natural Resources Conservation Service is explained, the estimated yields of the main crops and hay and pasture plants are listed for each soil, and prime farmland is described.

Most of the corn, alfalfa and other grass-legume hay mixtures, and oats produced in the county is fed to dairy cattle herds. On the wetter soils, red clover and timothy are common substitutes for bromegrass-alfalfa hay. Corn and soybeans also are commonly grown as cash crops. Forage species for improved pasture are generally the same as for hay. Forage species are green-chopped and hauled to feeding areas. Permanent pasture is mostly bluegrass.

The soils in Pepin County vary in their suitability for vegetables and other specialty crops. Special management generally is needed for these crops, which are most commonly grown in areas of nearly level and gently sloping, somewhat excessively drained and excessively drained, sandy soils. Management for potato production, for example, includes the basic management techniques used for the commonly grown crops plus intensive management for applications of irrigation water, herbicide, fungicide, and insecticide. Some of the other vegetable and specialty crops grown in Pepin County are sweet corn, beans, squash, melons, pumpkins, and strawberries.

The potential of the soils in Pepin County for increased production of food is good. Most areas that are suitable for crops and pasture are presently used for these purposes, but production could generally be increased by applying the latest crop production technology to all of the cropland in the county.

Crops and Pasture

John W. Pingry, agronomist, Natural Resources Conservation Service, helped prepare this section.

The major management concerns in the county are slope, water erosion and wind erosion, potential for surface-water and ground-water contamination, limited

available water capacity, depth to rock, wetness, and flooding.

Management systems needed on cropland are those that protect or improve the soil, help to control erosion, and minimize water contamination caused by soil particles, animal waste, and plant nutrients.

Erosion

Water erosion can be a major hazard on many of the soils used for crops in Pepin County where the surface layer is silt loam, slopes are more than 4 percent, and slope length is more than 100 feet. Pepin, Seaton, and NewGlarus soils, for example, are potentially susceptible to water erosion. As the slope increases, the hazard of erosion and the difficulty in controlling erosion also increase.

Soils suitable for cultivation on the hills in Pepin County have gently sloping to moderately steep slopes. The soils are easily eroded because they have a high content of silt, which can be easily dislodged by the impact of rainfall and easily transported by surface runoff. Severe erosion can occur in areas where the erodibility of the soil resulting from the silty texture is further affected by steepness and length of slope.

Loss of the surface layer through water erosion is damaging for several reasons. First, productivity is reduced as the surface layer is lost and part of the subsurface layer or subsoil is incorporated into the plow layer. The surface layer contains more organic matter than other parts of the soil. Loss of the surface layer is especially damaging on soils that have a layer in or below the subsoil that limits the depth of the root zone, such as the clayey subsoil in the NewGlarus soils and the bedrock in the Hixton soils. Second, incorporation of material from the subsurface layer or subsoil can result in poor tilth and crusting, which in turn can result in poor seed germination or poor seedling emergence. Finally, erosion can result in the sedimentation and contamination of streams. Controlling erosion helps to prevent this contamination and improves water quality for farm and municipal use, for recreation, and for fish and wildlife.

In Pepin County, water erosion occurs mainly as

concentrated flow erosion, referred to as gully erosion, and as sheet and rill erosion.

After the survey area was settled, the soils were cropped with little or no protection from erosion. The erosion process was accelerated, and gullies became common. Many former gullies in areas of cropland have been filled, shaped, and seeded as grassed waterways. Many small dams have been constructed at the heads of steep gullies to reduce the hazard of erosion in cropped areas.

Sheet erosion is most intense on the convex parts of the steeper slopes. The soils on these convex slopes have lost all or part of the surface layer. Many cropped fields and some pastures, however, show evidence that much of the original surface layer remains, even though severe gullies may be a few feet away. Generally, the nearly level to gently sloping cultivated soils and soils that have not been cultivated have experienced the least soil loss.

Extensive erosion probably took place in the area from about 1860 to 1940. During this period, hills and valley slopes were cleared and plowed for the first time. Corn was planted up and down the slope and was commonly cross-cultivated. Some areas that were cultivated with horse-drawn equipment cannot be farmed with present-day machinery. Some fields may have been cultivated as many as eight or nine times in a season (Simon, 1965). As oxidation of organic matter and excessive tillage reduced the size of soil particles, raindrops could more easily break down the clusters into finer particles. These particles filled pores and voids in the surface soil, producing the familiar puddled soil that forms a crust as it dries. The rates of runoff and erosion increased dramatically. Individual particles of soil that were no longer bound together were carried away. Much of this erosional, mostly silty sediment was deposited on the floor of valleys to an average thickness of about 2 to 5 feet (Knox, 1977). Arenzville, Chaseburg, Boguscreek, and Orion soils formed in this recent silty alluvium.

Since the latter part of the 1930's, the application of soil conservation practices has significantly reduced the rate of soil loss. Erosion-control measures provide a protective surface cover, reduce the runoff rate, and increase the rate of water infiltration. A cropping system that keeps a plant cover on the surface for extended periods can help to hold soil losses to an amount that does not reduce the productivity of the soil. On livestock farms, where pasture and hay are needed, including grasses and legumes in the cropping system not only provides nitrogen and improves tilth but also reduces the hazard of erosion.

Conservation Tillage

Conservation tillage systems are very effective in controlling runoff and erosion and increasing the rate of water infiltration. The use of a chisel plow, disk, or other conservation tillage equipment can leave 30 to 50 percent of the surface covered with plant residue. This residue helps to prevent the displacement and movement of soil particles. No-till planting (fig. 18) is even more effective in controlling erosion because only a small slot is opened where the seed is planted, and a residue cover of 50 to 90 percent is possible. Conservation tillage systems can be used on most of the soils in the county.

Contour Farming

In Pepin County, contour farming and contour stripcropping combined with grassed waterways (fig. 19) are the main practices used to control erosion on soils that have slopes of 4 to 20 percent. Contour strips consist of alternating fields of corn, soybeans, or small grain with fields of hay. They effectively reduce the runoff rate, help to control erosion, and increase the rate of water infiltration. Grassed waterways remove excess surface water and reduce the hazard of erosion along natural drainageways. Shallow drainageways crossing sloping soils can easily develop into gullies unless the drains are shaped, seeded, and maintained in grass. Contour farming, contour stripcropping, and grassed waterways are suitable for most soils and for the feed grain-hay rotations that are common with dairy farming in Pepin County.

Terraces and Diversions

Terraces and diversions reduce the hazard of erosion by reducing the length of slopes. They are not commonly used in Pepin County because they are most practical on deep or very deep, well drained or moderately well drained soils that have uniform slopes. Terraces and diversions are less effective on soils that have irregular slopes, would be excessively wet in the terrace channels, have a clayey subsoil that would be exposed in the terrace channels, or have bedrock within a depth of 40 inches. Only a few areas in the county, mainly areas of Seaton and Mt. Carroll soils, are suitable for terraces.

Wind erosion is a major hazard on sandy soils, such as Finchford (fig. 20), Drammen, and Chelsea soils. It occurs mostly in the fall or early spring, when the soils are bare of vegetation. Wind erosion removes



Figure 18.—No-till planting is very effective in reducing the hazard of erosion in this area of Pepin silt loam, 12 to 20 percent slopes, eroded.

valuable organic matter and nutrients and tends to increase droughtiness. It can damage or destroy plants in a few hours if winds are strong and the soils are dry and have no protective cover. Maintaining a cover of vegetation or crop residue on the surface, stripcropping, and planting field windbreaks help to control wind erosion.

Flooding and Wetness

Wetness is a major management concern on some of the soils in the county, such as Lows and Newson soils. Frequent flooding and wetness are major concerns in areas of the Ettrick soils. On some soils, such as Alganssee and Kalmarville soils, frequent flooding and wetness essentially preclude cultivation. Some very poorly drained organic soils, such as Houghton, Markey, Palms, and Seelyeville soils, typically do not have suitable outlets and remain so wet throughout the year, even where they are artificially drained, that in most years a successful

harvest of the common crops is very difficult. The somewhat poorly drained soils, such as Bearpen, Hoopston, Farrington, and Orion soils, are wet enough that spring planting is delayed and crops are damaged during most years unless a drainage system is installed. Occasional flooding limits the production and harvesting of crops during wet years in unprotected areas of Chaseburg, Arenzville, and Orion soils.

For the successful production of row crops, a combination of surface and subsurface drains is needed in most areas where wetness is a major concern. In areas where the soils are underlain by stratified silt and very fine sand or fine sand, such as Ettrick and Bearpen soils, special covering is needed over the drainage tile. This covering helps to keep substratum material from filling and clogging the tile.

If organic soils are used as cropland, special management measures are necessary. These soils oxidize and subside when water is removed from the pores and the pores are filled with air. Drainage



Figure 19.—A grassed waterway in an area of Seaton soils.

systems that control the depth and period of drainage are needed. Keeping the water table at the level required for crop growth during the growing season and raising it to the surface during other parts of the year can minimize the oxidation and subsidence of these soils.

Dikes and diversions can help to prevent flooding. Diversions on the adjacent upland soil or field ditches at the base of adjacent uplands help to intercept and control runoff.

Soil Fertility

Soil fertility varies in the soils of Pepin County, depending on natural fertility and the cropping history. Most of the soils are naturally acid. Applications of lime are needed to neutralize the acidity of these soils to the level required by the crop. Available phosphorus

and potassium levels are naturally low or medium in most of the soils. On all soils, additions of lime or fertilizer should be based on the results of soil tests, the needs of the crop, and the desired level of yields.

Organic matter is an important source of nitrogen for plants. Dairy cattle provide large amounts of organic matter in the form of manure. The manure is mostly applied to cropland. In addition to improving fertility, it increases the rate of water infiltration, minimizes surface crusting, and reduces soil losses resulting from erosion.

Soil Tilth

Soil tilth is an important factor affecting the germination of seeds, the emergence of seedlings, and the infiltration of water into the soils. Soils that have good tilth are granular and porous. Tilling and

grazing during wet periods can result in poor tilth in areas of Ella and Seaton soils and in areas of other soils that have a surface layer of silt loam. If the soil is bare, a surface crust can form during periods of heavy rainfall. This crust reduces the rate of water infiltration and increases the runoff rate and the hazard of erosion. Maintaining tilth is especially difficult on eroded soils because they have a lower content of organic matter than soils that have not been subject to erosion. Returning crop residue to the soil, growing green manure crops, and regularly adding manure improve tilth and minimize crusting.

Irrigation

In most years, irrigation can greatly increase crop yields on soils that have a very low to moderate available water capacity. For example, irrigation in areas of Finchford, Burkhardt, Plainfield, and Chelsea soils helps to maintain a sufficient amount of available water for vegetables and other specialty crops.

Because of the rapid and very rapid permeability in these soils, however, proper scheduling of irrigation is necessary to prevent the leaching of plant nutrients and other chemicals out of the root zone and eventually into the ground water.

Managing Pasture

Brian Pillsbury, grazing land specialist, Natural Resources Conservation Service, helped prepare this section.

Pasture management is needed to establish and maintain highly productive forage grasses and legumes. Management can include a fertilization program, rotation grazing, proper stocking rates, deferred grazing during wet periods, bush and weed control, and provision for a full-season grazing system. Full-season grazing systems may combine cool-season grasses for early season and late season grazing and warm-season grasses for grazing during the warmer, drier summer months. Planting the cool- and warm-season grasses in different pastures and



Figure 20.—Wind erosion in an area of Finchford soils. Maintaining a cover of vegetation or crop residue on the surface, stripcropping, and planting field windbreaks can minimize crop damage and help to prevent the loss of soil, organic matter, and nutrients from the surface layer.

using a rotation grazing system result in the maximum utilization of the forage produced.

Soils that are poorly suited to cultivated crops because of the slope, a low available water capacity, or wetness are typically used for pasture. Some areas of soils that are suitable for many other land uses are used as pasture because of the economic benefits of managing intensive grazing on small or medium-sized farms or those with less capital in machinery and housing.

Kentucky bluegrass, in varying levels of condition, is the main pasture species in most parts of the county. Many areas of pasture are brushy or weedy. Brush and weeds should be removed in these areas. Livestock should be rotated through paddocks for a duration of not more than a few days. Including rest periods can encourage even grass growth and taller grass species.

Continuous mob stocking reduces the quality of the pastures because it does not allow the plants to recover after grazing. Managed or rotation grazing is necessary to match livestock nutritional needs with the growth of the plant. Pastures should be alternately grazed and rested to allow for adequate regrowth of the plants.

Other techniques can be used to improve pasture health and the quality and quantity of the forage. For example, interseeding legumes in predominantly grass pastures can increase digestibility and production during the midsummer heat. Fertilizers should be applied according to the results of soil tests. Split applications of nitrogen fertilizer may be needed in stands that are predominantly grass.

Mechanical harvesting of excess forage is necessary on full-season pastures. This method keeps plants in a vegetative growing state and thus helps to maximize production.

Deferring grazing during wet periods can minimize soil compaction, rutting, and damage to growing plants.

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 survey area for crops are shown in the table "Cropland Management Considerations." 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, potential poor till 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 create drainage problems, raise the water table, and increase 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.—Permeability is 6 inches per hour or more within the soil profile.

Flooding.—Flooding is occasional or 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. The water table 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).—Depth to the water table is 4 feet or less, the permeability of any layer is more than 6.0 inches per hour, 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 flooded or 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.

Restricted permeability.—Permeability is less than 0.06 inch per hour 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 map unit name or in the description of the surface layer.

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.

Crop Yield Estimates

The average yields per acre that can be expected of the principal crops under a high level of management are shown in the table “Land Capability and Yields per Acre of Crops and Pasture.” 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 land capability classification of the map units in the survey area also is shown in the table.

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.

Crops other than those shown in the table 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 of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Pasture and Hayland Interpretations

Under good management, proper grazing is essential for the production of high-quality forage, stand survival, and erosion control. Proper grazing helps plants to maintain sufficient and generally vigorous top growth during the growing season. Brush control is essential in many areas, and weed control generally is needed. Rotation grazing and renovation also are important management practices.

Yield estimates are often provided in animal unit months (AUM), or 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.

The local office of the Natural Resources Conservation Service or of the Cooperative Extension Service can provide information about forage yields other than those shown in the table "Land Capability and Yields per Acre of Crops and Pasture."

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 take into account 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 woodland or for engineering purposes.

In the capability system, soils generally are grouped at three levels: capability class, subclass, and unit (USDA, 1961). These categories indicate the degree

and kinds of limitations affecting mechanized farming systems that produce the more commonly grown field crops, such as corn, small grain, cotton, hay, and field-grown vegetables. Only class and subclass are used in this survey.

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

If properly managed, soils in classes 1, 2, 3, and 4 are suitable for the mechanized production of commonly grown field crops and for pasture and woodland. The degree of the soil limitations affecting the production of cultivated crops increases progressively from class 1 to class 4. The limitations can affect levels of production and the risk of permanent soil deterioration caused by erosion and other factors.

Soils in classes 5, 6, and 7 are generally not suited to the mechanized production of commonly grown field crops without special management, but they are suitable for plants that provide a permanent cover, such as grasses and trees. The severity of the soil limitations affecting crops increases progressively from class 5 to class 7.

Areas in class 8 are generally not suitable for crops, pasture, or woodland without a level of management that is impractical. These areas may have potential for other uses, such as recreational facilities and wildlife habitat.

Capability subclasses identify the dominant kind of limitation in the class. They are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, 2*e*. The letter *e* shows that the main hazard is the risk of erosion unless a 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.

There are no subclasses in class 1 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 mainly to pasture, rangeland, woodland, wildlife habitat, or recreation.

The capability classification of the map units in the survey area is given in the table "Land Capability and Yields per Acre of Crops and Pasture" at the end of this section.

Prime Farmland

Prime farmland is of major importance in meeting the Nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, State, and Federal levels, as well as individuals, must encourage and facilitate the wise use of our Nation's prime farmland.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to food, feed, forage, fiber, and oilseed crops. Such soils have properties that favor the economic production of sustained high yields of crops. The soils need only to be treated and managed by acceptable farming methods. An adequate moisture supply and a sufficiently long growing season are required. Prime farmland soils produce the highest yields with minimal expenditure of energy and economic resources, and farming these soils results in the least damage to the environment.

Prime farmland soils may presently be used for cropland, pasture, or woodland or for other purposes. They either are used for food and fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water-control structures. Public land is land not available for farming in National forests, National parks, military reservations, and State parks.

Prime farmland soils commonly receive an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable, and the level of acidity or alkalinity and the content of salts and sodium are acceptable. The soils have few, if any, rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding. Slopes range mainly from 0 to 6 percent.

Soils that have a high water table or are subject to flooding may qualify as prime farmland where these limitations are overcome by drainage measures or flood control. Onsite evaluation is necessary to determine the effectiveness of corrective measures. More information about the criteria for prime farmland can be obtained at the

local office of the Natural Resources Conservation Service.

A recent trend in land use has been the conversion of prime farmland to urban and industrial uses. The loss of prime farmland to other uses puts pressure on lands that are less productive than prime farmland.

About 26,301 acres, or nearly 17 percent of the survey area, meets the requirements for prime farmland.

The map units in the survey area that meet the requirements for prime farmland are listed in the table "Prime Farmland" at the end of this section. On some soils included in the table, measures that overcome limitations are needed. The need for these measures is indicated in parentheses after the map unit name. The location of each map unit is shown on the detailed soil maps. The soil qualities that affect use and management are described in the section "Soil Series and Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Erosion Factors

Soil erodibility (K) and soil-loss tolerance (T) factors are used in an equation that predicts the amount of soil lost through water erosion in areas of cropland. The procedure for predicting soil loss is useful in guiding the selection of soil and water conservation practices. The erosion factors for the soils in the survey area are listed in the table "Physical Properties of the Soils."

Soil Erodibility (K) Factor

The soil erodibility (K) factor indicates the susceptibility of a soil to sheet and rill erosion by water. The soil properties that influence erodibility are those that affect the infiltration rate, the movement of water through the soil, and the water storage capacity of the soil and those that allow the soil to resist dispersion, splashing, abrasion, and the transporting forces of rainfall and runoff. The most important soil properties are the content of silt plus very fine sand, the content of sand coarser than very fine sand, the content of organic matter, soil structure, and permeability.

Fragment-Free Soil Erodibility (Kf) Factor

This is one of the factors used in the revised Universal Soil Loss Equation (RUSLE). It shows the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Soil-Loss Tolerance (T) Factor

The soil-loss tolerance (T) factor is an estimate of the maximum annual rate of soil erosion that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons of soil loss per acre per year. Ratings of 1 to 5 are used, depending on soil properties and prior erosion. The criteria used in assigning a T factor to a soil include maintenance of an adequate rooting depth for crop production, potential reduction of crop yields, maintenance of water-control structures affected by sedimentation, prevention of gullyng, and the value of nutrients lost through erosion.

Wind Erodibility Groups

Wind erodibility is directly related to the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. From this percentage, the wind erodibility index (I) factor is determined. This factor is an expression of the stability of the soil aggregates, or the extent to which they are broken down by tillage and the abrasion caused by windblown soil particles. Soils are assigned to wind erodibility groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 millimeter. The wind erodibility groups and wind erodibility index are listed in the table "Physical Properties of the Soils."

Additional information about wind erodibility groups and K, K_f, T, and I factors can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service.

Windbreaks and Environmental Plantings

Windbreaks protect livestock, buildings, and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low- and high-growing broadleaf and

coniferous trees and shrubs provide the most protection.

Field windbreaks are narrow plantings made at right angles to the prevailing wind and at specific intervals across the field. The interval depends on the erodibility of the soil. Field windbreaks protect cropland and crops from wind, help to keep snow on the fields, and provide food and cover for wildlife.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition.

Windbreaks are often planted on land that did not originally support trees. Knowledge of how trees perform on such land can be gained only by observing and recording the performance of trees that have been planted and have survived. Many popular windbreak species are not indigenous to the areas in which they are planted.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters, a tree or shrub may grow well or grow poorly, depending on the characteristics of the soil. Each tree or shrub has definable potential heights in a given physiographic area and under a given climate. Accurate definitions of potential heights are necessary when a windbreak is planned and designed.

The table "Windbreaks and Environmental Plantings" shows the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates in this table are based on measurements and observation of established plantings that have been given adequate care. They can be used as a guide in planning windbreaks and screens. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from local offices of the Natural Resources Conservation Service or the Cooperative Extension Service or from a nursery.

Cropland Management Considerations

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

Map symbol and soil name	Cropland management considerations
11A: Markey-----	Excessive permeability Flooding High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
20A: Palms-----	High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
Houghton-----	High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
21A: Palms-----	Flooding High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
40A: Markey-----	Excessive permeability High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
Seelyeville-----	High content of organic matter Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
114B2: Mt. Carroll-----	Potential for surface-water contamination Previously eroded Water erosion
114C2: Mt. Carroll-----	Potential for surface-water contamination Previously eroded Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
115B2: Seaton-----	Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
115C2: Seaton-----	Limited content of organic matter Potential for surface-water contamination Previously eroded Water erosion
115D2: Seaton-----	Limited content of organic matter Potential for surface-water contamination Previously eroded Slope Water erosion
116C2: Churchtown-----	Potential for surface-water contamination Previously eroded Water erosion
116D2: Churchtown-----	Potential for surface-water contamination Previously eroded Slope Water erosion
116E: Churchtown-----	Potential for surface-water contamination Slope Water erosion
125B2: Pepin-----	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
125C2: Pepin-----	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
125D2: Pepin-----	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion
125E2: Pepin-----	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
144B2: NewGlarus-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
144C2: NewGlarus-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
144D2: NewGlarus-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion
144E: NewGlarus-----	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion
213C2: Hixton-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
213D2: Hixton-----	Depth to rock Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion
213E2: Hixton-----	Depth to rock Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
224B: Elevasil-----	Depth to rock Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
224C2: Elevasil-----	Depth to rock 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
224D2: Elevasil-----	Depth to rock Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion Wind erosion
233C: Boone-----	Depth to rock Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
254B2: Norden-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
254C2: Norden-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
254D2: Norden-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
254E2: Norden-----	Depth to rock Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion
254F: Norden-----	Depth to rock Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion
255B2: Urne-----	Depth to rock 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
255C2: Urne-----	Depth to rock 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
255D2: Urne-----	Depth to rock Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Slope Water erosion Wind erosion
255E: Urne-----	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
255F: Urne-----	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
265B: Garne-----	Depth to rock Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Wind erosion
265C: Garne-----	Depth to rock Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
303A: Boguscreek-----	Excessive permeability Flooding Potential for ground-water contamination Potential for surface-water contamination
313D2: Plumcreek-----	Limited content of organic matter Potential for surface-water contamination Previously eroded Slope Water erosion
313F: Plumcreek-----	Limited content of organic matter Potential for surface-water contamination Slope Water erosion
316B2: Ella-----	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
316C2: Ella-----	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
318A: Bearpen-----	Potential for ground-water contamination Potential for surface-water contamination Water table
326B2: Medary-----	Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
403A: Dakota-----	Excessive permeability Potential for ground-water contamination

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
413A: Rasset-----	Excessive permeability Potential for ground-water contamination Wind erosion
413B: Rasset-----	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
423A: Meridian-----	Excessive permeability Potential for ground-water contamination
423B2: Meridian-----	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
429A: Lows-----	Excessive permeability Flooding Ponding Potential for ground-water contamination Potential for surface-water contamination Water table
432A: Kevilar-----	Excessive permeability Potential for ground-water contamination Wind erosion
432B: Kevilar-----	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
432C2: Kevilar-----	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
433A: Forkhorn-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
433B: Forkhorn-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
433C2: Forkhorn-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion Wind erosion
436A: Rusktown-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
438A: Hoopeston-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
453A: Burkhardt-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
453B: Burkhardt-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
501A: Finchford-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
501B: Finchford-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
502B2: Chelsea-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Previously eroded Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
502C2: Chelsea-----	Excessive permeability 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
506A: Komro-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
508A: Farrington-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
510B: Boplain-----	Depth to rock Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
510C: Boplain-----	Depth to rock 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
510F: Boplain-----	Depth to rock Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
511A: Plainfield-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
511B: Plainfield-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
511C: Plainfield-----	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
511F: Plainfield-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
512B: Drammen-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
512C: Drammen-----	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
512D: Drammen-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
516A: Aldo-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
546A: Prissel-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
546B: Prissel-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
546F: Prissel-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
561B: Tarr-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
566A: Tint-----	Excessive permeability Limited available water capacity Limited content of organic matter Potential for ground-water contamination Wind erosion
589A: Newson-----	Excessive permeability Limited available water capacity Ponding Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
616B: Chaseburg-----	Flooding Potential for surface-water contamination Water erosion
626A: Arenzville-----	Flooding Potential for ground-water contamination Potential for surface-water contamination
628A: Orion-----	Flooding Potential for ground-water contamination Potential for surface-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
629A: Ettrick-----	Flooding Ponding Potential for ground-water contamination Potential for surface-water contamination Water table
646A: Dunnbot-----	Excessive permeability Flooding Potential for ground-water contamination Potential for surface-water contamination Wind erosion
656A: Scotah-----	Excessive permeability Flooding Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Wind erosion
826B2: Hersey-----	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
826C2: Hersey-----	Potential for ground-water contamination Potential for surface-water contamination Previously eroded Water erosion
1135F: Dorerton-----	Potential for surface-water contamination Slope Water erosion
Elbaville-----	Potential for surface-water contamination Slope Water erosion
1145F: Gaphill-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Rockbluff-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
1155F: Brodale-----	Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Surface rock fragments Water erosion
Bellechester-----	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Rock outcrop.	
1224F: Boone-----	Depth to rock Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Elevasil-----	Depth to rock Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1648A: Northbend-----	Excessive permeability Flooding Potential for ground-water contamination Potential for surface-water contamination Water table
Ettrick-----	Flooding Ponding Potential for ground-water contamination Potential for surface-water contamination Water table
1658A: Alganssee-----	Excessive permeability Flooding Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
Kalmarville-----	Excessive permeability Flooding Potential for ground-water contamination Potential for surface-water contamination Water table

Cropland Management Considerations--Continued

Map symbol and soil name	Cropland management considerations
2003A: Riverwash.	
2013: Pits, gravel.	
2014: Pits, quarry.	
2040: Udipsamments.	
2050: Landfill.	

Land Capability and Yields per Acre of Crops and 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	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
11A----- Markey	7w	---	---	---	---	---	---	---
20A: Palms and Houghton-----	6w	---	---	---	---	---	---	---
Palms and Houghton, drained-----	3w	125	20	41	---	---	---	---
21A----- Palms	7w	---	---	---	---	---	---	---
40A: Markey and Seelyeville-----	6w	---	---	---	---	---	---	---
Markey and Seelyeville, drained-----	3w	110	18	36	---	---	---	---
114B2----- Mt. Carroll	2e	155	25	51	95	57	5.8	4.8
114C2----- Mt. Carroll	3e	145	24	48	85	53	5.4	4.4
115B2----- Seaton	2e	145	24	48	85	51	5.5	4.8
115C2----- Seaton	3e	135	22	45	75	47	5.1	4.4
115D2----- Seaton	4e	125	20	41	65	43	4.7	4.0
116C2----- Churchtown	3e	135	22	45	75	47	5.1	4.4
116D2----- Churchtown	4e	130	20	41	65	43	4.7	4.0

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
116E----- Churchtown	6e	---	---	---	---	---	4.5	3.6
125B2----- Pepin	2e	145	24	48	85	51	5.5	4.8
125C2----- Pepin	3e	135	22	45	75	47	5.1	4.4
125D2----- Pepin	4e	125	20	41	65	43	4.7	4.0
125E2----- Pepin	6e	---	---	---	---	---	4.5	3.6
144B2----- NewGlarus	2e	110	16	33	65	39	4.2	3.4
144C2----- NewGlarus	3e	100	15	31	55	35	3.8	3.0
144D2----- NewGlarus	4e	95	14	29	50	31	3.4	2.8
144E----- NewGlarus	6e	---	---	---	---	---	3.1	2.2
213C2----- Hixton	3e	95	15	31	65	37	3.5	2.8
213D2----- Hixton	4e	85	14	28	55	33	3.1	2.4
213E2----- Hixton	6e	---	---	---	---	---	2.8	1.8
224B----- Elevasil	3s	90	15	28	65	39	3.8	3.1
224C2----- Elevasil	3e	80	13	26	55	35	3.4	2.7
224D2----- Elevasil	4e	70	11	23	45	31	3.0	2.3
233C----- Boone	6s	40	6	13	30	31	1.8	0.9

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
254B2----- Norden	2e	110	18	36	75	45	4.2	3.6
254C2----- Norden	3e	100	16	33	65	41	3.8	3.2
254D2----- Norden	4e	95	15	29	55	37	3.4	2.8
254E2----- Norden	6e	---	---	---	---	---	3.1	2.2
254F----- Norden	7e	---	---	---	---	---	---	2.0
255B2----- Urne	3s	85	14	27	60	38	3.8	2.9
255C2----- Urne	3e	75	12	25	50	34	3.4	2.5
255D2----- Urne	4e	65	11	21	40	30	3.0	2.1
255E----- Urne	6e	---	---	---	---	---	2.7	2.1
255F----- Urne	7e	---	---	---	---	---	---	1.9
265B----- Garne	3s	85	13	25	70	42	4.0	3.8
265C----- Garne	3e	80	12	23	65	39	3.5	3.8
303A----- Boguscreek	2w	150	25	50	85	51	5.7	5.0
313D2----- Plumcreek	4e	125	20	41	65	43	4.7	3.8
313F----- Plumcreek	7e	---	---	---	---	---	---	3.4

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
316B2----- Ella	2e	140	23	46	75	45	5.3	5.0
316C2----- Ella	3e	130	21	43	65	41	4.9	4.6
318A----- Bearpen	2w	135	22	45	70	42	5.2	4.5
326B2----- Medary	2e	100	16	31	70	37	4.0	3.9
403A----- Dakota	2s	110	18	36	70	42	4.4	3.9
413A----- Rasset	3s	100	15	31	55	37	4.2	3.0
413B----- Rasset	3s	100	15	31	55	37	4.2	3.0
423A----- Meridian	2s	105	16	35	65	39	4.2	3.4
423B2----- Meridian	2e	105	16	35	65	39	4.2	3.4
429A: Lows-----	6w	---	---	---	---	---	---	---
Lows, drained---	2w	105	17	35	---	---	---	2.9
432A----- Kevilar	3s	100	16	31	60	37	4.2	2.9
432B----- Kevilar	3s	100	16	31	60	37	4.2	2.9
432C2----- Kevilar	3e	90	15	28	50	33	3.8	2.6
433A----- Forkhorn	3s	95	15	31	60	37	3.8	2.9
433B----- Forkhorn	3s	95	15	31	60	37	3.8	2.9

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
433C2----- Forkhorn	3e	85	14	28	50	33	3.4	2.6
436A----- Rusktown	3s	95	15	31	60	37	3.8	2.9
438A----- Hoopeston	3w	95	15	30	60	37	3.8	2.9
453A----- Burkhardt	3s	75	12	25	60	33	3.1	2.9
453B----- Burkhardt	3s	75	12	25	60	33	3.1	2.9
501A----- Finchford	4s	65	10	21	55	28	2.8	2.0
501B----- Finchford	4s	65	10	21	55	28	2.8	2.0
502B2----- Chelsea	4s	60	10	20	50	24	2.6	1.5
502C2----- Chelsea	6s	55	9	18	40	22	2.3	1.0
506A----- Komro	4s	65	10	21	55	28	2.8	2.0
508A----- Farrington	4w	75	12	25	60	30	3.0	2.2
510B----- Boplain	4s	45	7.0	15	35	19	2.1	1.1
510C----- Boplain	6s	40	6	13	30	17	1.9	0.9
510F----- Boplain	7s	---	---	---	---	---	1.7	0.7
511A----- Plainfield	4s	55	9	18	45	23	2.5	1.5

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
511B----- Plainfield	4s	55	9	18	45	23	2.5	1.5
511C----- Plainfield	6s	50	8	16	40	21	2.3	1.3
511F----- Plainfield	7s	---	---	---	---	---	1.7	0.7
512B----- Drammen	3s	65	10	20	50	25	2.8	1.7
512C----- Drammen	4s	60	10	18	45	23	2.6	1.5
512D----- Drammen	6s	55	9	18	40	21	2.3	1.3
516A----- Aldo	4s	55	9	18	45	23	2.5	1.5
546A----- Prissel	3s	65	10	20	50	25	2.8	1.7
546B----- Prissel	3s	65	10	20	50	25	2.8	1.7
546F----- Prissel	7s	---	---	---	---	---	1.7	0.7
561B----- Tarr	4s	45	7	15	35	19	2.1	1.1
566A----- Tint	4s	45	7	15	35	19	2.1	1.1
589A: Newson-----	6w	---	---	---	---	---	---	---
Newson, drained-	4w	60	10	20	---	---	---	1.8
616B----- Chaseburg	2e	125	20	41	75	45	4.7	4.6

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
626A----- Arenzville	2w	135	22	45	80	47	5.0	4.8
628A----- Orion	2w	125	20	41	75	45	4.5	4.0
629A: Ettrick-----	6w	---	---	---	---	---	---	---
Ettrick, drained	2w	125	20	41	---	---	---	4.0
646A----- Dunnbot	3w	95	15	31	60	37	3.8	2.9
656A----- Scotah	4s	55	9	18	45	23	2.5	1.5
826B2----- Hersey	2e	145	24	48	85	51	5.5	4.8
826C2----- Hersey	3e	135	22	45	75	47	5.1	4.4
1135F----- Dorerton- Elbaville	7e	---	---	---	---	---	---	2.3
1145F----- Gaphill-----	7e	---	---	---	---	---	---	1.2
Rockbluff-----	7s	---	---	---	---	---	---	---
1155F----- Brodale-----	7s	---	---	---	---	---	---	0.5
Bellechester----	7s	---	---	---	---	---	---	---
Rock outcrop----	8s	---	---	---	---	---	---	---

See footnote at end of table.

Land Capability and Yields per Acre of Crops and Pasture--Continued

Map symbol and soil name	Land capability	Corn	Corn silage	Soybeans	Oats	Wheat	Alfalfa hay	Kentucky bluegrass
		Bu	Tons	Bu	Bu	Bu	Tons	AUM*
1224F----- Boone-----	7s	---	---	---	---	---	---	1.2
Elevasil-----	7e							
1648A----- Northbend- Ettrick	7w	---	---	---	---	---	---	3.1
1658A----- Alganssee- Kalmarville	7w	---	---	---	---	---	---	2.5
2003A----- Riverwash	8w	---	---	---	---	---	---	---
2013----- Pits, gravel	8s	---	---	---	---	---	---	---
2014----- Pits, quarry	8s	---	---	---	---	---	---	---
2040----- Udipsamments	7s	---	---	---	---	---	---	---
2050----- Landfill	8s	---	---	---	---	---	---	---

* 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

Map symbol	Soil name
114B2	Mt. Carroll silt loam, 2 to 6 percent slopes, eroded
115B2	Seaton silt loam, 2 to 6 percent slopes, eroded
125B2	Pepin silt loam, 2 to 6 percent slopes, eroded
144B2	NewGlarus silt loam, 2 to 6 percent slopes, eroded
254B2	Norden silt loam, 2 to 6 percent slopes, eroded
255B	Urne fine sandy loam, 2 to 6 percent slopes
303A	Boguscreek silt loam, 0 to 3 percent slopes
316B2	Ella silt loam, 1 to 6 percent slopes, eroded
318A	Bearpen silt loam, 0 to 3 percent slopes (where drained)
326B2	Medary silt loam, 1 to 6 percent slopes, eroded
403A	Dakota silt loam, 0 to 3 percent slopes
413A	Rasset sandy loam, 0 to 3 percent slopes
413B	Rasset sandy loam, 2 to 6 percent slopes
423A	Meridian silt loam, 0 to 3 percent slopes
423B2	Meridian silt loam, 2 to 6 percent slopes, eroded
429A	Lows loam, 0 to 2 percent slopes (where drained)
432A	Kevilar sandy loam, 0 to 3 percent slopes
432B	Kevilar sandy loam, 2 to 6 percent slopes
433A	Forkhorn sandy loam, 0 to 3 percent slopes
433B	Forkhorn sandy loam, 2 to 6 percent slopes
436A	Rusktown sandy loam, 0 to 3 percent slopes
438A	Hoopeston sandy loam, 0 to 3 percent slopes (where drained)
616B	Chaseburg silt loam, 1 to 4 percent slopes
626A	Arenzville silt loam, 0 to 3 percent slopes
628A	Orion silt loam, 0 to 3 percent slopes (where drained)
629A	Ettrick silt loam, 0 to 2 percent slopes (where drained and either protected from flooding or not frequently flooded during the growing season)
646A	Dunnbot fine sandy loam, 0 to 3 percent slopes
826B2	Hersey silt loam, 2 to 6 percent slopes, eroded

Windbreaks and Environmental Plantings

(Only the soils that are suitable for windbreaks and environmental plantings are listed. Absence of an entry indicates that trees generally do not grow to the given height)

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
114B2: Mt. Carroll----	---	Siberian peashrub, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
114C2: Mt. Carroll----	---	Siberian peashrub, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
115B2: Seaton-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac, northern whitecedar.	Amur maple, hackberry, Russian-olive, eastern redcedar.	Green ash, red pine, eastern white pine.	---
115C2: Seaton-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac, northern whitecedar.	Amur maple, hackberry, Russian-olive, eastern redcedar.	Green ash, red pine, eastern white pine.	---
115D2: Seaton-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac, northern whitecedar.	Amur maple, hackberry, Russian-olive, eastern redcedar.	Green ash, red pine, eastern white pine.	---
116C2: Churchtown-----	Eastern redcedar	Siberian peashrub, gray dogwood, lilac.	Amur maple, hackberry, Russian-olive, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
116D2: Churchtown-----	Eastern redcedar	Siberian peashrub, gray dogwood, lilac.	Amur maple, hackberry, Russian-olive, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
116E: Churchtown-----	Eastern redcedar	Siberian peashrub, gray dogwood, lilac.	Amur maple, hackberry, Russian-olive, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
125B2: Pepin-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
125C2: Pepin-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
125D2: Pepin-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
125E2: Pepin-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
144B2: NewGlarus-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
144C2: NewGlarus-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
144D2: NewGlarus-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
144E: NewGlarus-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
213C2: Hixton-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
213D2: Hixton-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
213E2: Hixton-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
224B: Elevasil-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
224C2: Elevasil-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
224D2: Elevasil-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
233C: Boone-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
254B2: Norden-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
254C2: Norden-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
254D2: Norden-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
254E2: Norden-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
254F: Norden-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
255B2: Urne-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
255C2: Urne-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
255D2: Urne-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
255E: Urne-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
255F: Urne-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
265B: Garne-----	---	Amur maple, Siberian peashrub, silky dogwood, lilac, nannyberry viburnum.	Norway spruce, white spruce, Black Hills spruce.	Silver maple, green ash, red pine, eastern white pine.	---
265C: Garne-----	---	Amur maple, Siberian peashrub, silky dogwood, lilac, nannyberry viburnum.	Norway spruce, white spruce, Black Hills spruce.	Silver maple, green ash, red pine, eastern white pine.	---
303A: Boguscreek-----	---	Amur maple, gray dogwood, lilac, northern whitecedar, American cranberrybush.	Norway spruce, white spruce, Black Hills spruce.	Red maple, white ash, red pine, eastern white pine.	---
313D2: Plumcreek-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
313F: Plumcreek-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac.	Amur maple, hackberry, Russian-olive, eastern redcedar, blue spruce, northern whitecedar.	Green ash, eastern white pine.	---
318A: Bearpen-----	---	Silky dogwood, redosier dogwood, common ninebark, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, silver maple, white ash, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
326B2: Medary-----	---	Amur maple, alternateleaf dogwood, silky dogwood, gray dogwood, lilac, northern whitecedar, American cranberrybush.	White spruce-----	Red maple, white ash, red pine, eastern white pine.	---
403A: Dakota-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
413A: Rasset-----	Hedge cotoneaster	Siberian peashrub, eastern redcedar, Persian lilac.	Amur maple, hackberry, Russian-olive, Norway spruce, red pine.	Green ash, thornless honeylocust, eastern white pine.	---
413B: Rasset-----	Hedge cotoneaster	Siberian peashrub, eastern redcedar, Persian lilac.	Amur maple, hackberry, Russian-olive, Norway spruce, red pine.	Green ash, thornless honeylocust, eastern white pine.	---
423A: Meridian-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
423B2: Meridian-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
429A: Lows-----	---	Silky dogwood, redosier dogwood, common ninebark, northern whitecedar, nannyberry viburnum, American cranberrybush.	Balsam fir, white spruce.	Red maple, silver maple, white ash, green ash.	---
432A: Kevilar-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
432B: Kevilar-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
432C2: Kevilar-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
433A: Forkhorn-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
433B: Forkhorn-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
433C2: Forkhorn-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
436A: Rusktown-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
438A: Hoopeston-----	---	Redosier dogwood, lilac, northern whitecedar, nannyberry viburnum.	Amur maple, white spruce.	Red maple, hackberry, white ash, green ash, eastern white pine.	Silver maple.
453A: Burkhardt-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
453B: Burkhardt-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
501A: Finchford-----	Siberian peashrub, lilac.	Eastern redcedar, sargent crabapple.	Russian-olive, green ash, jack pine, Austrian pine, red pine, Siberian elm.	Eastern white pine	---
501B: Finchford-----	Siberian peashrub, lilac.	Eastern redcedar, sargent crabapple.	Russian-olive, green ash, jack pine, Austrian pine, red pine, Siberian elm.	Eastern white pine	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
502B2: Chelsea-----	Siberian peashrub, lilac.	Eastern redcedar	Jack pine, Austrian pine, red pine.	Eastern white pine	---
502C2: Chelsea-----	Siberian peashrub, lilac.	Eastern redcedar	Jack pine, Austrian pine, red pine.	Eastern white pine	---
506A: Komro-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
508A: Farrington-----	---	Silky dogwood, redosier dogwood, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, silver maple, white ash, red pine, eastern white pine.	---
510B: Boplain-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
510C: Boplain-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
510F: Boplain-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
511A: Plainfield-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
511B: Plainfield-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
511C: Plainfield-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
511F: Plainfield-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
512B: Drammen-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
512C: Drammen-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
512D: Drammen-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
516A: Aldo-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
546A: Prissel-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
546B: Prissel-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
546F: Prissel-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
561B: Tarr-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
566A: Tint-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
589A: Newson-----	---	Silky dogwood, redosier dogwood, common ninebark, northern whitecedar, nannyberry viburnum, American cranberrybush.	Balsam fir, white spruce.	Red maple, silver maple, white ash, green ash.	---
616B: Chaseburg-----	---	Silky dogwood, gray dogwood, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, silver maple, white ash, red pine, eastern white pine.	---
626A: Arenzville-----	---	Silky dogwood, redosier dogwood, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, white ash, red pine, eastern white pine.	Silver maple.
628A: Orion-----	---	Silky dogwood, redosier dogwood, common ninebark, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, silver maple, white ash, eastern white pine.	---
646A: Dunnbot-----	---	Silver maple, silky dogwood, redosier dogwood, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, white ash, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
656A: Scotah-----	---	Silky dogwood, Amur privet, common ninebark, nannyberry viburnum, American cranberrybush.	Manchurian crabapple, white spruce, northern whitecedar.	Green ash, Norway spruce, eastern white pine.	Imperial Carolina poplar.
826B2: Hersey-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac, northern whitecedar.	Amur maple, hackberry, Russian-olive, eastern redcedar.	Green ash, red pine, eastern white pine.	---
826C2: Hersey-----	---	Siberian peashrub, gray dogwood, redosier dogwood, lilac, northern whitecedar.	Amur maple, hackberry, Russian-olive, eastern redcedar.	Green ash, red pine, eastern white pine.	---
1135F: Dorerton-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
Elbaville-----	Siberian peashrub, lilac.	Hackberry, silky dogwood, eastern redcedar, Manchurian crabapple.	Russian-olive, green ash, honeylocust, jack pine, eastern white pine, bur oak.	---	---
1145F: Gaphill-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
Rockbluff-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
1155F: Brodale-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---

Windbreaks and Environmental Plantings--Continued

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
1155F: Bellechester----	Siberian peashrub, Tatarian honeysuckle, lilac.	Eastern redcedar	Jack pine, Austrian pine, red pine.	Eastern white pine	---
Rock outcrop.					
1224F: Boone-----	Manyflower cotoneaster.	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac, American cranberrybush.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
Elevasil-----	---	Amur maple, Siberian peashrub, silky dogwood, gray dogwood, eastern redcedar, lilac.	Norway spruce-----	Jack pine, red pine, eastern white pine.	---
1648A: Northbend-----	---	Silky dogwood, redosier dogwood, lilac, northern whitecedar, nannyberry viburnum, American cranberrybush.	White spruce-----	Red maple, white ash, red pine, eastern white pine.	Silver maple.
Ettrick.					
1658A: Alganssee-----	---	Silky dogwood, lilac, American cranberrybush.	Amur maple, Manchurian crabapple, white spruce, northern whitecedar.	Red maple, green ash, Norway spruce, eastern white pine.	Imperial Carolina poplar.
Kalmarville.					

Forest Land

Chris Widstrand, forester, Wisconsin Department of Natural Resources, helped prepare this section.

Pepin County has approximately 54,700 acres of forest land. Of this total, about 54,200 acres is considered commercial forest. The majority of the 500 acres of noncommercial forest land lies in the Chippewa River corridor and is reserved from harvesting because of environmental or endangered resource concerns. Nearly 91 percent of the forest land, approximately 50,000 acres, is privately owned. Ownership of the remaining 4,700 acres is divided between the State and the county. The largest portion of this area is the Tiffany Wildlife Area. Other areas include Nine Mile Island Natural Area, Lake Pepin State Park (undeveloped), Arkansaw County Park, and Silver Birch/Holden County Park.

Hardwoods cover 94 percent of the forest land in Pepin County. Oak is the dominant cover type and makes up 59 percent of the acreage. Northern hardwoods, such as sugar maple, basswood, and upland ashes, make up 12 percent; upland aspen and birch make up 12 percent; and bottom-land hardwoods, such as cottonwood, willow, silver maple, green ash, and hackberry, make up 11 percent. Conifers make up the remaining 6 percent of the forest. Plantations of Norway pine and white pine account for the majority of this acreage. Remnant stands of natural white pine, primarily along the Eau Galle and Chippewa Rivers, and native cedars along the steep west- and south-facing slopes above Lake Pepin also are included. There is one stand of native tamarack, the sole representative of lowland conifer forest in the county.

Current trends indicate that the growth of both hardwood and softwood is exceeding harvest by 20 to 30 percent. Acreage also is increasing at a rate of 50 to 100 acres per year. Approximately half of this increase is a result of reforestation. Mixtures of white pine or Norway spruce and ashes or oaks are currently being planted on silty and loamy sites, and white pine and red pine, in pure or mixed stands, are being planted on sandy sites. The other half of the annual increase is from natural forest succession into former pasture land or marginal cropland no longer

under cultivation. Low-value species, such as box elder, elm, aspen, and birch, are the most common. The majority of existing oak volume is in sawtimber size classes, and harvests are exceeding growth by nearly 40 percent for this valuable species. Quality of the harvested volume is also declining as a result of the widespread practice of "high grading" that occurred throughout the 1960's and 1970's. Oaks are being replaced on many sites by less valuable species, such as cherry, elm, hackberry, red maple, and basswood, as private landowners are unwilling to maintain oak through even-age management. Markets for most other species of hardwood logs remain strong. Aspen, birch, and hardwood pulp of all species are currently underutilized because of the lack of local markets and the prohibitive cost of trucking to existing markets. Softwood markets have improved dramatically in recent years, and all species, except white pine, are well utilized.

Forest Land Management Considerations

Information about the hazards and limitations that should be considered in areas used as forest land are given in the tables "Forest Land Harvest Equipment Considerations," "Forest Haul Road Considerations," "Forest Log Landing Considerations," and "Forest Land Site Preparation and Planting Considerations."

Forest Land Harvest Equipment Considerations

For most soils spring is the most limiting season. Alternate thawing and freezing during snowmelt cause saturation and low strength of the surface soil layers. When thawing is complete, saturation continues for short periods in well drained soils to nearly all year in very poorly drained depressional soils. Degrees of wetness are generally proportionate to water table height and duration. The water table generally is lower in the summer during the heavy use of moisture by vegetation and is nearer the surface during periods when absorbed precipitation is greater than the

vegetation requires. Harvesting during periods of saturation usually results in severe soil damage, except when the soil is frozen. The preferred season for timber harvest on many soils is winter, when wetness and low soil strength can be overcome by freezing.

Considerations shown in the table are as follows:

Slope.—The upper slope limit is more than 15 percent.

Flooding.—The map unit component is frequently flooded.

Wetness.—The map unit component is somewhat poorly drained, poorly drained, or very poorly drained or has a perched water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 10 inches.

Rubblly surface.—The word “rubblly” is in the map unit name.

Surface stones.—The words “extremely stony” are in the map unit name.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—The words “Rock outcrop” are in the map unit name.

Susceptible to rutting and wheel slippage (low strength).—The AASHTO classification is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Poor traction (loose sandy material).—The USDA texture includes sands or loamy sands in any layer at a depth of 10 inches or less.

Forest Haul Road Considerations

Haul roads serve as transportation routes from log landings to primary roads. Generally, haul roads are unpaved, but some are graveled.

Considerations shown in the table are as follows:

Slope.—The slope is 8 percent or more.

Flooding.—The map unit component is frequently flooded.

Wetness.—The map unit component is somewhat poorly drained, poorly drained, or very poorly drained or has a perched water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 20 inches.

Depth to soft rock.—The depth to soft bedrock is less than 20 inches.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—The words “Rock outcrop” are in the map unit name.

Low bearing strength.—The AASHTO classification

is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Rubblly surface.—The word “rubblly” is in the map unit name.

Forest Log Landing Considerations

Log landings are areas where logs are assembled for transportation. Areas that require little or no cutting, filling, or surface preparation are desired.

Considerations shown in the table are as follows:

Slope.—The slope is more than 3 percent.

Flooding.—The map unit component is occasionally flooded or frequently flooded.

Wetness.—The map unit component is somewhat poorly drained, poorly drained, or very poorly drained or has a perched water table (any drainage class).

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—The words “Rock outcrop” are in the map unit name.

Susceptible to rutting and wheel slippage (low strength).—The AASHTO classification is A-6, A-7, or A-8 in any layer at a depth of 20 inches or less.

Rubblly surface.—The word “rubblly” is in the map unit name.

Forest Land Site Preparation and Planting Considerations

Considerations shown in this table are as follows:

Slope.—The upper slope limit is more than 15 percent.

Flooding.—The map unit component is frequently flooded.

Wetness.—The map unit component is somewhat poorly drained, poorly drained, or very poorly drained or has a perched water table (any drainage class).

Depth to hard rock.—The depth to hard bedrock is less than 20 inches.

Surface stones.—The word “stony” is in the map unit name.

Surface boulders.—The word “bouldery” is in the map unit name.

Areas of rock outcrop.—The words “Rock outcrop” are in the map unit name.

Water erosion.—The slope is 8 percent or more.

Potential poor tilth and compaction.—The AASHTO classification is A-6 or A-7 in the upper 10 inches.

Rubblly surface.—The word “rubblly” is in the map unit name.

Cobbly surface.—The word “cobbly” is in the map unit name.

Forest Habitat Types

John Kotar, senior scientist, Department of Forestry, University of Wisconsin-Madison, helped prepare this section.

Modern forest management requires site classification that is based on ecological principles. It is not adequate to simply provide information on the trees that are suitable for planting on a particular soil map unit. Most trees, if planted, can grow on a wide range of soils under intensive management. Intensive management is costly, however, and in the U.S. is practiced only under special conditions. Also, other natural attributes of forests, such as wildlife (including nongame species), recreation, esthetics, and biodiversity, are becoming increasingly more important.

Classifying sites or landscape units according to their biological potential helps to address these concerns. Such classification should be in terms of potential vegetation, which includes all plant species, and not only in terms of productivity of the commercially important tree species. Such a system, known as the Habitat Type Classification System, has been developed for Wisconsin's forests and is in wide use by forest managers. The forest habitat types of Pepin County are derived from "A Guide to Forest Communities and Habitat Types of Central and Southern Wisconsin," which was published in 1996 (Kotar and Burger, 1996).

A habitat type is any land unit that is capable of supporting a particular type of climax plant community. Habitat types are identified by the presence of groups of so-called diagnostic species. The fully developed climax association need not be present for habitat type identification.

Although soil map units do not coincide exactly with habitat types, strong correlations between them do exist. Therefore, habitat types can provide valuable interpretation of soil map units for forest resource management.

The field guide for central and southern Wisconsin provides the following information: (1) Keys to habitat identification, based on presence and absence of diagnostic understory species; (2) a description of each habitat type in terms of understory species composition, prevalent forest cover types (successional stages), and expected successional trends; and (3) a summary of management implications of each habitat type. This summary, in combination with various tables and diagrams, identifies species best suited for management on a particular habitat type. This information takes into account the potential influence of competing vegetation as well as the inherent site capability. A

short summary of principal ecological characteristics of selected tree species is included.

The nature of forest vegetation of central and southern Wisconsin differs considerably from that in the north. In many areas, forests have been under continuous disturbance since, and in many cases prior to, Euro-American settlement. Disturbance included fires, grazing and other uses, and logging. For these reasons the application of the classification to specific sites can be difficult, particularly the use of the identification keys in the field guide. As much floristic and descriptive information as possible was included, however, so that users should be able to interpret the major management implications of most communities and sites (Kotar and Burger, 1996).

Not every community and site type is included in these classifications. The habitat types described are based on stands or woodlots that had acceptable conditions for sampling. For example, recently grazed or otherwise disturbed stands or low-density stands were not sampled. In some areas, the most productive soils are used entirely for agriculture and no forest was available for sampling. Particularly lacking were communities on the poorest sites, such as steep slopes and ridges with shallow soils, because these sites tend to be the most disturbed. Some of the habitat types that are described in this survey may not have been sampled in Pepin County.

Habitat types have been determined for most of the soils in Pepin County. Presently, habitat types have not been developed for the poorly drained and very poorly drained soils or the frequently flooded soils. The vegetation on many of the very poorly drained soils, such as Markey soils, consists of grasses, sedges, and brush and only a few patches of poorly formed trees. The frequently flooded soils, such as Alganssee soils, commonly are forested, but sufficient information to place them in a habitat type classification is not available at this time.

Where two habitat types are associated with a soil map unit, they are identified as primary and secondary. The primary habitat type is one that is most common on the map unit. The secondary habitat type is less common.

Habitat types for the detailed soil map units in the county are shown in the table "Forest Habitat Types." The following paragraphs briefly describe the habitat types in the county. The types are listed generally in order from the poorest and least productive to the most productive.

PVGy—*Pinus strobus/Vaccinium-Gaylussacia*

The common name is White pine/Low sweet blueberry-Huckleberry. This habitat type is classified

as very dry or dry/poor nutrient. It is typically on flats and the lower slopes. On the steep upper slopes, south and southwest aspects, and narrow ridges, a xeric subtype is recognized. Although no specific plants reflect these severely dry conditions, tree growth is strongly limited.

Various mixtures of pines (jack pine, red pine, white pine), pin oak, black oak, and white oak occur. Pines exhibit normal growth, but oaks attain only small stature and poor form. Red maple occurs mostly as saplings. In the literature these communities are commonly referred to as pine and oak barrens.

Shrubs and small trees are poorly developed or do not occur. Serviceberry, black cherry, blackberries, and raspberries are common but have low coverage. Red maple and black cherry are typically dominant.

Except for brackenfern, herbs are largely absent or sparsely distributed. Most common are common milkweed, whorled loosestrife, and wild lily of the valley.

All tree species occurring on this type are adapted to fire disturbance. In the absence of fire, white pine appears to be best suited for reproduction in the understory and could be expected to dominate undisturbed stands. White oak also appears to regenerate well enough to remain as a permanent associate. Red pine, jack pine, and black oak would be less common. Red maple and black cherry are generally well represented in the sapling layer but attain only small tree size and can be expected to persist as understory associates.

PVHa—*Pinus strobus/Vaccinium-Hamamelis*

The common name is White pine/Low sweet blueberry-Witchhazel. This habitat type is classified as dry/poor or medium nutrient. It is perhaps the most productive of the habitat types that are typical of sandy soils.

Species composition is similar to that of the PVRh habitat type. White pine, red maple, and pin oak are most common, but white oak, red oak, and aspen also occur. Quality varies greatly, reflecting differences in past use, but all of these species show good growth in some stands.

The shrub and small tree layer is generally not dense. Serviceberry, huckleberry, mapleleaf viburnum, black cherry, blackberries, raspberries, witchhazel, and beaked hazel are most common. Mapleleaf viburnum and, especially, witchhazel are strong indicators of this habitat type.

Common ground flora species are blueberries, wintergreen, sessile bellwort, and bigleaf aster. Starflower, swamp dewberry, partridgeberry, and winterberry occur in scattered areas.

White pine is regenerating in all cover types if a seed source is present. This species is therefore considered as a potential permanent and dominant component of any forest type. Red maple is probably the strongest potential associate but only in the secondary canopy layer. White oak and, especially, red oak are likely to decrease in importance without large-scale disturbance.

PVCr—*Pinus strobus/Vaccinium-Cornus racemosa*

The common name is White pine/Low sweet blueberry-Gray dogwood. This habitat type is classified as dry/medium nutrient.

Mixtures of white oak, black oak, and pin oak and white pine are the most common trees. Jack pine also is common. Red oak generally does not occur. Red maple is common. This species grows better in areas of this habitat type than in areas of the PVGy habitat type but less well than in areas of the ArDe-V habitat type. Black cherry is almost always present as saplings but does not develop well into a larger size class.

The shrub and small tree layer is much better represented in areas of this habitat type than in areas of the PVGy habitat type. Most diagnostic in this respect are gray dogwood and chokecherry. Black cherry is also better represented in the PVCr habitat type. Other important species are blackberries, raspberries, hazel, and serviceberry.

The herbaceous layer is poorly developed. A few species are better represented in areas of this habitat type than in areas of the PVGy habitat type and are useful for identification. These are wild sarsaparilla, true Solomons seal, and Virginia creeper.

All tree species are adapted to fire disturbance. The relative frequency and intensity of fire probably controlled community composition in presettlement time. There is no evidence to suggest that in the absence of fire the same species, with the exception of jack pine, could not maintain themselves on this type. White pine, because of its much larger stature and longer life span than other species, is presumed to be a potential dominant species.

PVRh—*Pinus strobus/Vaccinium-Rubus hispida*

The common name is White pine/Low sweet blueberry-Dewberry. This habitat type is classified as dry-mesic/poor nutrient.

White pine, red maple, and pin oak, in various mixtures, are the most common dominant species in current stands. White oak and jack pine are common associates, but red oak does not normally occur.

The shrub and small tree layer is generally absent or poorly developed. Huckleberry is conspicuous, but

other species have low coverage. The species that generally occur are black cherry, serviceberry, and winterberry. Winterberry is best represented in areas of this habitat type. Conspicuously rare are gray dogwood, chokecherry, and hazel. All of these species are typically well represented on dry and dry-mesic sites.

Partridgeberry, swamp dewberry, starflower, ground pine, goldthread, bunchberry, and yellow beadleily have only moderate occurrence but readily distinguish this type from others. These species are characteristically members of northern forests and are rarely found in southern habitat types. Cinamon fern may dominate the herb layer, especially where ground water is nearer the surface.

White pine was the dominant presettlement species in areas of this habitat type. Red maple and pin oak were probably always present, but these species assumed dominance after white pine was logged off. Since then, the white pine seed source has slowly increased, and white pine regeneration is now common in many stands.

ArDe-V—*Acer rubrum/Desmodium, Vaccinium* variant

The common name is Red maple/Pointed-leaf tick trefoil, Low sweet blueberry variant. This habitat type is classified as a transition between dry and dry-mesic.

White oak and red maple are the most common dominant species in stands that were sampled, but red oak can also occur. Pin oak and black oak are much less common in areas of this habitat type than in areas of the PVCr habitat type. White pine also is common.

The shrub and small tree layer is generally well represented. Major species, in decreasing order of average coverage, are hazel, blackberries and raspberries, serviceberry, black cherry, gray dogwood, and bush honeysuckle. Red maple saplings commonly dominate this layer.

Total herb coverage and number of species are higher than on other dry habitat types of this region. Blueberry occurs with small coverage and helps to distinguish ArDe-V from ArCi and other dry-mesic and mesic types. The species that best distinguishes this type from the drier types is pointed-leaf tick trefoil. Other diagnostic species with lower occurrences are sweet cicely, wild geranium, and hog peanut. The best represented species are brackenfern, bigleaf aster, tick trefoil, wild sarsaparilla, and Virginia creeper.

The presettlement fire regime favored the development of oak communities. Red oak is not reproducing adequately in current stands, even when this species is dominant in the overstory. White oak, however, shows some ability to persist. Red maple is

the most shade-tolerant species that is well adapted to these sites and is presumed to be a climax species. It is also possible that white pine can again become a permanent member of communities in areas of this habitat type once it can be established as a seed source.

ArCi and ArCi-Ph—*Acer rubrum/Circaea* and *Acer rubrum/Circaea, Phryma* variant

The common names are Red maple/Nightshade and Red maple/Nightshade, Lopseed variant. Both of these community types are classified as dry-mesic/medium or rich nutrient. ArCi is commonly in areas of loamy soils, and ArCi-Ph is in areas where the soils have a mantle of silt loam. Red oak, white oak, and red maple, in relatively pure stands or in mixtures, are most common. Hardwoods that are more commonly associated with soils higher in natural fertility and with a more favorable moisture regime, such as sugar maple, basswood, and white ash, are in scattered areas in some stands of the ArCi-Ph type.

Regardless of the composition of tree species in current stands, the ArCi community type can be identified by strong representation of any of the following ground flora species: nightshade, Virginia creeper, sweet cicely, wild geranium, and gooseberries. Both community types are distinguished from the drier habitat types in the county by a general absence of blueberry and huckleberry. Similarly, they are distinguished from the more moist habitat types by a general absence of the blue cohosh ecological species group. ArCi-Ph is typically distinguishable from ArCi by the occurrence of lopseed (*Phryma*). Other floristic differences between the two community types are subtle.

The climax nature of ArCi and ArCi-Ph has not been adequately studied. Red maple is presently the most common species capable of reproducing in existing oak stands. For these reasons, ArCi and ArCi-Ph are referred to as “community types” rather than as habitat types. Red maple can perhaps be viewed as a “pseudo-climax” species until a sugar maple seed source once again becomes common on sites where fire once controlled the plant community dynamics.

AArVb—*Acer saccharum-Acer rubrum/Viburnum acerifolium*

The common name is Sugar Maple-red maple/mapleleaf viburnum. This habitat type is classified as dry-mesic/medium nutrient.

Areas of this habitat type are dominantly used as cropland, and a limited number of sites are available for sampling. Stands that were sampled are dominated by red oak and white oak, but red maple and sugar

maple also are common. Most characteristic in the shrub and small tree layer is mapleleaf viburnum. Other species, in order of decreasing average coverage, include hazel, black cherry, chokecherry, fly honeysuckle, and bush honeysuckle, but ironwood and red maple typically dominate this layer.

Species typical of dry-mesic habitats prevail in the understory. These include mapleleaf viburnum, hazel, bigleaf aster, wild sarsaparilla, pointed-leaf tick trefoil, and brackenfern. The occurrence of blueberry is also noteworthy because it underscores the trend toward a drier site type.

Maps of presettlement vegetation show a complex pattern in the area where this habitat type was identified. Oak, pine, prairie, and maple-basswood communities were found. It is clear that fire has played a major role. In the absence of fire, oak stands readily succeed to either red maple or sugar maple. Sugar maple does not appear to be outcompeting red maple in areas of this habitat type; therefore, both species are included in the habitat type name.

**ATiCa-La and ATiSa-De—*Acer-Tilia/Caulophyllum*,
Laportea variant, and *Acer-Tilia/Sanguinaria*,
Desmodium variant**

The common names are Sugar maple-Basswood/Blue cohosh, Wood nettle variant, and Sugar maple-Basswood/Bloodroot, Pointed-leaf tick trefoil variant. These habitat types are classified as mesic/very rich nutrient.

Most areas of these habitat types have been converted to agricultural use. ATiCa-La is predominantly on the less sloping broader summits or on the steeper slopes that have north and east

aspects. ATiSa-De is more common on the steeper slopes that have south and west aspects.

Both habitat types are typically dominated by sugar maple and basswood. Red oak and bitternut hickory are common associates. White oak, ironwood, and red maple are more common in areas of the ATiSa-De variant. White ash is rare in comparison with areas of mesic/very rich nutrient sites in other regions.

The shrub layer is not well developed on either of these two variants when the tree canopy is closed. The most common species are gooseberry, chokecherry, and alternate-leaf dogwood. Ironwood is abundant in areas of the ATiSa-De variant.

The mesic/rich nutrient species group is well represented in both variants, although total herb coverage tends to be low. The species that are most characteristic are bloodroot, blue cohosh, sharp-lobed hepatica, wild ginger, and trillium. Wood nettle was found in only about half of the study stands of the ATiCa-La variant, but coverage levels were high (10 to 20 percent). Pointed-leaf tick trefoil, wild geranium, bigleaf aster, black snakeroot, green briar, and zig-zag goldenrod are much better represented in areas of the ATiSa-De variant.

In presettlement time these sites were dominated by sugar maple-basswood forest and were surrounded by oak openings, oak savanna, or prairie. There are no consistent soil differences among these presettlement vegetation types to account for the variation. Fire history appears to be the primary cause. Maple-basswood forests appear to be stable on these habitat types. Stands dominated by any other species, especially oaks, are also being replaced by maple-basswood wherever adequate seed sources exist.

Forest Land Harvest Equipment Considerations

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

Map symbol and soil name	Forest land harvest equipment considerations
11A: Markey-----	Flooding Susceptible to rutting and wheel slippage Wetness
20A: Palms-----	Susceptible to rutting and wheel slippage Wetness
Houghton-----	Susceptible to rutting and wheel slippage Wetness
21A: Palms-----	Flooding Susceptible to rutting and wheel slippage Wetness
40A: Markey-----	Susceptible to rutting and wheel slippage Wetness
Seelyeville-----	Susceptible to rutting and wheel slippage Wetness
114B2: Mt. Carroll-----	Susceptible to rutting and wheel slippage
114C2: Mt. Carroll-----	Susceptible to rutting and wheel slippage
115B2: Seaton-----	Susceptible to rutting and wheel slippage
115C2: Seaton-----	Susceptible to rutting and wheel slippage
115D2: Seaton-----	Slope Susceptible to rutting and wheel slippage
116C2: Churchtown-----	Susceptible to rutting and wheel slippage
116D2: Churchtown-----	Slope Susceptible to rutting and wheel slippage
116E: Churchtown-----	Slope Susceptible to rutting and wheel slippage
125B2: Pepin-----	Susceptible to rutting and wheel slippage
125C2: Pepin-----	Susceptible to rutting and wheel slippage

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
125D2: Pepin-----	Slope Susceptible to rutting and wheel slippage
125E2: Pepin-----	Slope Susceptible to rutting and wheel slippage
144B2: NewGlarus-----	Susceptible to rutting and wheel slippage
144C2: NewGlarus-----	Susceptible to rutting and wheel slippage
144D2: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
144E: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
213C2: Hixton-----	Susceptible to rutting and wheel slippage
213D2: Hixton-----	Slope Susceptible to rutting and wheel slippage
213E2: Hixton-----	Slope Susceptible to rutting and wheel slippage
224B: Elevasil-----	No major considerations or hazards
224C2: Elevasil-----	No major considerations or hazards
224D2: Elevasil-----	Slope
233C: Boone-----	Poor traction (loose sandy material)
254B2: Norden-----	Susceptible to rutting and wheel slippage
254C2: Norden-----	Susceptible to rutting and wheel slippage
254D2: Norden-----	Slope Susceptible to rutting and wheel slippage
254E2: Norden-----	Slope Susceptible to rutting and wheel slippage
254F: Norden-----	Slope Susceptible to rutting and wheel slippage

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
255B2: Urne-----	No major considerations or hazards
255C2: Urne-----	No major considerations or hazards
255D2: Urne-----	Slope
255E: Urne-----	Slope
255F: Urne-----	Slope
265B: Garne-----	Poor traction (loose sandy material)
265C: Garne-----	Poor traction (loose sandy material)
303A: Boguscreek-----	No major considerations or hazards
313D2: Plumcreek-----	Slope Susceptible to rutting and wheel slippage
313F: Plumcreek-----	Slope Susceptible to rutting and wheel slippage
316B2: Ella-----	Susceptible to rutting and wheel slippage Wetness
316C2: Ella-----	Susceptible to rutting and wheel slippage Wetness
318A: Bearpen-----	Susceptible to rutting and wheel slippage Wetness
326B2: Medary-----	Susceptible to rutting and wheel slippage Wetness
403A: Dakota-----	Susceptible to rutting and wheel slippage
413A: Rasset-----	Susceptible to rutting and wheel slippage
413B: Rasset-----	Susceptible to rutting and wheel slippage
423A: Meridian-----	Susceptible to rutting and wheel slippage
423B2: Meridian-----	Susceptible to rutting and wheel slippage

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
429A: Lows-----	Susceptible to rutting and wheel slippage Wetness
432A: Kevilar-----	Wetness
432B: Kevilar-----	Wetness
432C2: Kevilar-----	Wetness
433A: Forkhorn-----	No major considerations or hazards
433B: Forkhorn-----	No major considerations or hazards
433C2: Forkhorn-----	No major considerations or hazards
436A: Rusktown-----	No major considerations or hazards
438A: Hoopeston-----	Wetness
453A: Burkhardt-----	No major considerations or hazards
453B: Burkhardt-----	No major considerations or hazards
501A: Finchford-----	Poor traction (loose sandy material)
501B: Finchford-----	Poor traction (loose sandy material)
502B2: Chelsea-----	Poor traction (loose sandy material)
502C2: Chelsea-----	Poor traction (loose sandy material)
506A: Komro-----	Poor traction (loose sandy material)
508A: Farrington-----	Poor traction (loose sandy material) Wetness
510B: Boplain-----	Poor traction (loose sandy material)
510C: Boplain-----	Poor traction (loose sandy material)
510F: Boplain-----	Poor traction (loose sandy material) Slope

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
511A: Plainfield-----	Poor traction (loose sandy material)
511B: Plainfield-----	Poor traction (loose sandy material)
511C: Plainfield-----	Poor traction (loose sandy material)
511F: Plainfield-----	Poor traction (loose sandy material) Slope
512B: Drammen-----	Poor traction (loose sandy material)
512C: Drammen-----	Poor traction (loose sandy material)
512D: Drammen-----	Poor traction (loose sandy material) Slope
516A: Aldo-----	Poor traction (loose sandy material)
546A: Prissel-----	Poor traction (loose sandy material) Wetness
546B: Prissel-----	Poor traction (loose sandy material) Wetness
546F: Prissel-----	Poor traction (loose sandy material) Slope Wetness
561B: Tarr-----	Poor traction (loose sandy material)
566A: Tint-----	Poor traction (loose sandy material)
589A: Newson-----	Poor traction (loose sandy material) Wetness
616B: Chaseburg-----	No major considerations or hazards
626A: Arenzville-----	No major considerations or hazards
628A: Orion-----	Susceptible to rutting and wheel slippage Wetness
629A: Ettrick-----	Flooding Susceptible to rutting and wheel slippage Wetness

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
646A: Dunnbot-----	No major considerations or hazards
656A: Scotah-----	Poor traction (loose sandy material)
826B2: Hersey-----	Susceptible to rutting and wheel slippage Wetness
826C2: Hersey-----	Susceptible to rutting and wheel slippage Wetness
1135F: Dorerton-----	Slope Susceptible to rutting and wheel slippage
Elbaville-----	Slope Susceptible to rutting and wheel slippage
1145F: Gaphill-----	Slope
Rockbluff-----	Poor traction (loose sandy material) Slope
1155F: Brodale-----	Areas of rock outcrop Slope
Bellechester-----	Areas of rock outcrop Poor traction (loose sandy material) Slope
Rock outcrop.	
1224F: Boone-----	Poor traction (loose sandy material) Slope
Elevasil-----	Slope
1648A: Northbend-----	Flooding Wetness
Ettrick-----	Flooding Susceptible to rutting and wheel slippage Wetness
1658A: Alganssee-----	Flooding Poor traction (loose sandy material) Wetness
Kalmarville-----	Flooding Wetness
2003A: Riverwash.	

Forest Land Harvest Equipment Considerations--Continued

Map symbol and soil name	Forest land harvest equipment considerations
2013: Pits, gravel.	
2014: Pits, quarry.	
2040: Udipsamments.	
2050: Landfill.	

Forest Haul Road Considerations

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

Map symbol and soil name	Forest haul road considerations
11A: Markey-----	Flooding Low bearing strength Wetness
20A: Palms-----	Low bearing strength Wetness
Houghton-----	Low bearing strength Wetness
21A: Palms-----	Flooding Low bearing strength Wetness
40A: Markey-----	Low bearing strength Wetness
Seelyeville-----	Low bearing strength Wetness
114B2: Mt. Carroll-----	Low bearing strength
114C2: Mt. Carroll-----	Low bearing strength Slope
115B2: Seaton-----	Low bearing strength
115C2: Seaton-----	Low bearing strength Slope
115D2: Seaton-----	Low bearing strength Slope
116C2: Churchtown-----	Low bearing strength Slope
116D2: Churchtown-----	Low bearing strength Slope
116E: Churchtown-----	Low bearing strength Slope
125B2: Pepin-----	Low bearing strength
125C2: Pepin-----	Low bearing strength Slope

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
125D2: Pepin-----	Low bearing strength Slope
125E2: Pepin-----	Low bearing strength Slope
144B2: NewGlarus-----	Low bearing strength
144C2: NewGlarus-----	Low bearing strength Slope
144D2: NewGlarus-----	Low bearing strength Slope
144E: NewGlarus-----	Low bearing strength Slope
213C2: Hixton-----	Low bearing strength Slope
213D2: Hixton-----	Low bearing strength Slope
213E2: Hixton-----	Low bearing strength Slope
224B: Elevasil-----	No major considerations or hazards
224C2: Elevasil-----	Slope
224D2: Elevasil-----	Slope
233C: Boone-----	Slope
254B2: Norden-----	Low bearing strength
254C2: Norden-----	Low bearing strength Slope
254D2: Norden-----	Low bearing strength Slope
254E2: Norden-----	Low bearing strength Slope

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
254F: Norden-----	Low bearing strength Slope
255B2: Urne-----	No major considerations or hazards
255C2: Urne-----	Slope
255D2: Urne-----	Slope
255E: Urne-----	Slope
255F: Urne-----	Slope
265B: Garne-----	No major considerations or hazards
265C: Garne-----	Slope
303A: Boguscreek-----	No major considerations or hazards
313D2: Plumcreek-----	Low bearing strength Slope
313F: Plumcreek-----	Low bearing strength Slope
316B2: Ella-----	Low bearing strength Wetness
316C2: Ella-----	Low bearing strength Slope Wetness
318A: Bearpen-----	Low bearing strength Wetness
326B2: Medary-----	Low bearing strength Wetness
403A: Dakota-----	Low bearing strength
413A: Rasset-----	Low bearing strength
413B: Rasset-----	Low bearing strength

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
423A: Meridian-----	Low bearing strength
423B2: Meridian-----	Low bearing strength
429A: Lows-----	Low bearing strength
	Wetness
432A: Kevilar-----	Wetness
432B: Kevilar-----	Wetness
432C2: Kevilar-----	Slope
	Wetness
433A: Forkhorn-----	No major considerations or hazards
433B: Forkhorn-----	No major considerations or hazards
433C2: Forkhorn-----	Slope
436A: Rusktown-----	No major considerations or hazards
438A: Hoopeston-----	Wetness
453A: Burkhardt-----	No major considerations or hazards
453B: Burkhardt-----	No major considerations or hazards
501A: Finchford-----	No major considerations or hazards
501B: Finchford-----	No major considerations or hazards
502B2: Chelsea-----	No major considerations or hazards
502C2: Chelsea-----	Slope
506A: Komro-----	No major considerations or hazards
508A: Farrington-----	Wetness
510B: Boplain-----	No major considerations or hazards
510C: Boplain-----	Slope

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
510F: Boplain-----	Slope
511A: Plainfield-----	No major considerations or hazards
511B: Plainfield-----	No major considerations or hazards
511C: Plainfield-----	Slope
511F: Plainfield-----	Slope
512B: Drammen-----	No major considerations or hazards
512C: Drammen-----	Slope
512D: Drammen-----	Slope
516A: Aldo-----	No major considerations or hazards
546A: Prissel-----	Wetness
546B: Prissel-----	Wetness
546F: Prissel-----	Slope Wetness
561B: Tarr-----	No major considerations or hazards
566A: Tint-----	No major considerations or hazards
589A: Newson-----	Wetness
616B: Chaseburg-----	No major considerations or hazards
626A: Arenzville-----	No major considerations or hazards
628A: Orion-----	Low bearing strength Wetness
629A: Ettrick-----	Flooding Low bearing strength Wetness
646A: Dunnbot-----	No major considerations or hazards

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
656A: Scotah-----	No major considerations or hazards
826B2: Hersey-----	Low bearing strength Wetness
826C2: Hersey-----	Low bearing strength Slope Wetness
1135F: Dorerton-----	Low bearing strength Slope
Elbaville-----	Low bearing strength Slope
1145F: Gaphill-----	Slope
Rockbluff-----	Slope
1155F: Brodale-----	Areas of rock outcrop Slope
Bellechester-----	Areas of rock outcrop Slope
Rock outcrop.	
1224F: Boone-----	Slope
Elevasil-----	Slope
1648A: Northbend-----	Flooding Wetness
Ettrick-----	Flooding Low bearing strength Wetness
1658A: Alganssee-----	Flooding Wetness
Kalmarville-----	Flooding Wetness
2003A: Riverwash.	
2013: Pits, gravel.	
2014: Pits, quarry.	

Forest Haul Road Considerations--Continued

Map symbol and soil name	Forest haul road considerations
2040: Udipsamments.	
2050: Landfill.	

Forest Log Landing Considerations

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

Map symbol and soil name	Forest log landing considerations
11A: Markey-----	Flooding Susceptible to rutting and wheel slippage Wetness
20A: Palms-----	Susceptible to rutting and wheel slippage Wetness
Houghton-----	Susceptible to rutting and wheel slippage Wetness
21A: Palms-----	Flooding Susceptible to rutting and wheel slippage Wetness
40A: Markey-----	Susceptible to rutting and wheel slippage Wetness
Seelyeville-----	Susceptible to rutting and wheel slippage Wetness
114B2: Mt. Carroll-----	Slope Susceptible to rutting and wheel slippage
114C2: Mt. Carroll-----	Slope Susceptible to rutting and wheel slippage
115B2: Seaton-----	Slope Susceptible to rutting and wheel slippage
115C2: Seaton-----	Slope Susceptible to rutting and wheel slippage
115D2: Seaton-----	Slope Susceptible to rutting and wheel slippage
116C2: Churchtown-----	Slope Susceptible to rutting and wheel slippage
116D2: Churchtown-----	Slope Susceptible to rutting and wheel slippage
116E: Churchtown-----	Slope Susceptible to rutting and wheel slippage
125B2: Pepin-----	Slope Susceptible to rutting and wheel slippage

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
125C2: Pepin-----	Slope Susceptible to rutting and wheel slippage
125D2: Pepin-----	Slope Susceptible to rutting and wheel slippage
125E2: Pepin-----	Slope Susceptible to rutting and wheel slippage
144B2: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
144C2: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
144D2: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
144E: NewGlarus-----	Slope Susceptible to rutting and wheel slippage
213C2: Hixton-----	Slope Susceptible to rutting and wheel slippage
213D2: Hixton-----	Slope Susceptible to rutting and wheel slippage
213E2: Hixton-----	Slope Susceptible to rutting and wheel slippage
224B: Elevasil-----	Slope
224C2: Elevasil-----	Slope
224D2: Elevasil-----	Slope
233C: Boone-----	Slope
254B2: Norden-----	Slope Susceptible to rutting and wheel slippage
254C2: Norden-----	Slope Susceptible to rutting and wheel slippage
254D2: Norden-----	Slope Susceptible to rutting and wheel slippage

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
254E2: Norden-----	Slope Susceptible to rutting and wheel slippage
254F: Norden-----	Slope Susceptible to rutting and wheel slippage
255B2: Urne-----	Slope
255C2: Urne-----	Slope
255D2: Urne-----	Slope
255E: Urne-----	Slope
255F: Urne-----	Slope
265B: Garne-----	Slope
265C: Garne-----	Slope
303A: Boguscreek-----	Flooding
313D2: Plumcreek-----	Slope Susceptible to rutting and wheel slippage
313F: Plumcreek-----	Slope Susceptible to rutting and wheel slippage
316B2: Ella-----	Slope Susceptible to rutting and wheel slippage Wetness
316C2: Ella-----	Slope Susceptible to rutting and wheel slippage Wetness
318A: Bearpen-----	Susceptible to rutting and wheel slippage Wetness
326B2: Medary-----	Slope Susceptible to rutting and wheel slippage Wetness
403A: Dakota-----	Susceptible to rutting and wheel slippage

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
413A: Rasset-----	Susceptible to rutting and wheel slippage
413B: Rasset-----	Slope Susceptible to rutting and wheel slippage
423A: Meridian-----	Susceptible to rutting and wheel slippage
423B2: Meridian-----	Slope Susceptible to rutting and wheel slippage
429A: Lows-----	Flooding Susceptible to rutting and wheel slippage Wetness
432A: Kevilar-----	Wetness
432B: Kevilar-----	Slope Wetness
432C2: Kevilar-----	Slope Wetness
433A: Forkhorn-----	No major considerations or hazards
433B: Forkhorn-----	Slope
433C2: Forkhorn-----	Slope
436A: Rusktown-----	No major considerations or hazards
438A: Hoopeston-----	Wetness
453A: Burkhardt-----	No major considerations or hazards
453B: Burkhardt-----	Slope
501A: Finchford-----	No major considerations or hazards
501B: Finchford-----	Slope
502B2: Chelsea-----	Slope
502C2: Chelsea-----	Slope

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
506A: Komro-----	No major considerations or hazards
508A: Farrington-----	Wetness
510B: Boplain-----	Slope
510C: Boplain-----	Slope
510F: Boplain-----	Slope
511A: Plainfield-----	No major considerations or hazards
511B: Plainfield-----	Slope
511C: Plainfield-----	Slope
511F: Plainfield-----	Slope
512B: Drammen-----	Slope
512C: Drammen-----	Slope
512D: Drammen-----	Slope
516A: Aldo-----	No major considerations or hazards
546A: Prissel-----	Wetness
546B: Prissel-----	Slope Wetness
546F: Prissel-----	Slope Wetness
561B: Tarr-----	Slope
566A: Tint-----	No major considerations or hazards
589A: Newson-----	Wetness
616B: Chaseburg-----	Flooding Slope

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
626A: Arenzville-----	Flooding
628A: Orion-----	Flooding Susceptible to rutting and wheel slippage Wetness
629A: Ettrick-----	Flooding Susceptible to rutting and wheel slippage Wetness
646A: Dunnbot-----	Flooding
656A: Scotah-----	Flooding
826B2: Hersey-----	Slope Susceptible to rutting and wheel slippage Wetness
826C2: Hersey-----	Slope Susceptible to rutting and wheel slippage Wetness
1135F: Dorerton-----	Slope Susceptible to rutting and wheel slippage
Elbaville-----	Slope Susceptible to rutting and wheel slippage
1145F: Gaphill-----	Slope
Rockbluff-----	Slope
1155F: Brodale-----	Areas of rock outcrop Slope
Bellechester-----	Areas of rock outcrop Slope
Rock outcrop.	
1224F: Boone-----	Slope
Elevasil-----	Slope
1648A: Northbend-----	Flooding Wetness
Ettrick-----	Flooding Susceptible to rutting and wheel slippage Wetness

Forest Log Landing Considerations--Continued

Map symbol and soil name	Forest log landing considerations
1658A: Alganssee-----	Flooding Wetness
Kalmarville-----	Flooding Wetness
2003A: Riverwash.	
2013: Pits, gravel.	
2014: Pits, quarry.	
2040: Udipsamments.	
2050: Landfill.	

Forest Land Site Preparation and Planting Considerations

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

Map symbol and soil name	Site preparation and planting considerations
11A: Markey-----	Flooding Wetness
20A: Palms-----	Wetness
Houghton-----	Wetness
21A: Palms-----	Flooding Wetness
40A: Markey-----	Wetness
Seelyeville-----	Wetness
114B2: Mt. Carroll-----	No major considerations or hazards
114C2: Mt. Carroll-----	Water erosion
115B2: Seaton-----	No major considerations or hazards
115C2: Seaton-----	Water erosion
115D2: Seaton-----	Slope Water erosion
116C2: Churchtown-----	Potential poor tilth and compaction Water erosion
116D2: Churchtown-----	Potential poor tilth and compaction Slope Water erosion
116E: Churchtown-----	Potential poor tilth and compaction Slope Water erosion
125B2: Pepin-----	Potential poor tilth and compaction
125C2: Pepin-----	Potential poor tilth and compaction Water erosion
125D2: Pepin-----	Potential poor tilth and compaction Slope Water erosion

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
125E2: Pepin-----	Potential poor tilth and compaction Slope Water erosion
144B2: NewGlarus-----	Potential poor tilth and compaction
144C2: NewGlarus-----	Potential poor tilth and compaction Water erosion
144D2: NewGlarus-----	Potential poor tilth and compaction Slope Water erosion
144E: NewGlarus-----	Potential poor tilth and compaction Slope Water erosion
213C2: Hixton-----	Potential poor tilth and compaction Water erosion
213D2: Hixton-----	Potential poor tilth and compaction Slope Water erosion
213E2: Hixton-----	Potential poor tilth and compaction Slope Water erosion
224B: Elevasil-----	No major considerations or hazards
224C2: Elevasil-----	Water erosion
224D2: Elevasil-----	Slope Water erosion
233C: Boone-----	Water erosion
254B2: Norden-----	Potential poor tilth and compaction
254C2: Norden-----	Potential poor tilth and compaction Water erosion
254D2: Norden-----	Potential poor tilth and compaction Slope Water erosion

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
254E2: Norden-----	Potential poor tilth and compaction Slope Water erosion
254F: Norden-----	Potential poor tilth and compaction Slope Water erosion
255B2: Urne-----	No major considerations or hazards
255C2: Urne-----	Water erosion
255D2: Urne-----	Slope Water erosion
255E: Urne-----	Slope Water erosion
255F: Urne-----	Slope Water erosion
265B: Garne-----	No major considerations or hazards
265C: Garne-----	Water erosion
303A: Boguscreek-----	No major considerations or hazards
313D2: Plumcreek-----	Potential poor tilth and compaction Slope Water erosion
313F: Plumcreek-----	Potential poor tilth and compaction Slope Water erosion
316B2: Ella-----	Potential poor tilth and compaction Wetness
316C2: Ella-----	Potential poor tilth and compaction Water erosion Wetness
318A: Bearpen-----	Potential poor tilth and compaction Wetness
326B2: Medary-----	Wetness

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
403A: Dakota-----	Potential poor tilth and compaction
413A: Rasset-----	No major considerations or hazards
413B: Rasset-----	No major considerations or hazards
423A: Meridian-----	No major considerations or hazards
423B2: Meridian-----	No major considerations or hazards
429A: Lows-----	Wetness
432A: Kevilar-----	Wetness
432B: Kevilar-----	Wetness
432C2: Kevilar-----	Water erosion Wetness
433A: Forkhorn-----	No major considerations or hazards
433B: Forkhorn-----	No major considerations or hazards
433C2: Forkhorn-----	Water erosion
436A: Rusktown-----	No major considerations or hazards
438A: Hoopeston-----	Wetness
453A: Burkhardt-----	No major considerations or hazards
453B: Burkhardt-----	No major considerations or hazards
501A: Finchford-----	No major considerations or hazards
501B: Finchford-----	No major considerations or hazards
502B2: Chelsea-----	No major considerations or hazards
502C2: Chelsea-----	Water erosion
506A: Komro-----	No major considerations or hazards

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
508A: Farrington-----	Wetness
510B: Boplain-----	No major considerations or hazards
510C: Boplain-----	Water erosion
510F: Boplain-----	Slope Water erosion
511A: Plainfield-----	No major considerations or hazards
511B: Plainfield-----	No major considerations or hazards
511C: Plainfield-----	Water erosion
511F: Plainfield-----	Slope Water erosion
512B: Drammen-----	No major considerations or hazards
512C: Drammen-----	Water erosion
512D: Drammen-----	Slope Water erosion
516A: Aldo-----	No major considerations or hazards
546A: Prissel-----	Wetness
546B: Prissel-----	Wetness
546F: Prissel-----	Slope Water erosion Wetness
561B: Tarr-----	No major considerations or hazards
566A: Tint-----	No major considerations or hazards
589A: Newson-----	Wetness
616B: Chaseburg-----	No major considerations or hazards

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
626A: Arenzville-----	No major considerations or hazards
628A: Orion-----	Potential poor tilth and compaction Wetness
629A: Ettrick-----	Flooding Wetness
646A: Dunnbot-----	No major considerations or hazards
656A: Scotah-----	No major considerations or hazards
826B2: Hersey-----	Wetness
826C2: Hersey-----	Water erosion Wetness
1135F: Dorerton-----	Slope Water erosion
Elbaville-----	Potential poor tilth and compaction Slope Water erosion
1145F: Gaphill-----	Slope Water erosion
Rockbluff-----	Slope Water erosion
1155F: Brodale-----	Areas of rock outcrop Slope Water erosion
Bellechester-----	Areas of rock outcrop Slope Water erosion
Rock outcrop.	
1224F: Boone-----	Slope Water erosion
Elevasil-----	Slope Water erosion
1648A: Northbend-----	Flooding Wetness
Ettrick-----	Flooding Wetness

Forest Land Site Preparation and Planting Considerations--Continued

Map symbol and soil name	Site preparation and planting considerations
1658A: Alganssee-----	Flooding Wetness
Kalmarville-----	Flooding Wetness
2003A: Riverwash.	
2013: Pits, gravel.	
2014: Pits, quarry.	
2040: Udipsamments.	
2050: Landfill.	

Forest Habitat Types

(See text for a description of terms used in this table)

Map symbol	Soil name(s)	Habitat symbol	Dominance	Short scientific name
11A	Markey-----	Norg	Primary	N/A (organic soils)
20A	Palms, Houghton-----	Norg	Primary	N/A (organic soils)
21A	Palms-----	Norg	Primary	N/A (organic soils)
40A	Markey, Seelyeville-----	Norg	Primary	N/A (organic soils)
114B2	Mt. Carroll-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
114C2	Mt. Carroll-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
115B2	Seaton-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
115C2	Seaton-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
115D2	Seaton-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
116C2	Churchtown-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
116D2	Churchtown-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
116E	Churchtown-----	ATiCa-La ATiSa-De	Primary Secondary	Acer-Tilia/Caulophyllum (Laportea) Acer-Tilia/Sanguinaria (Desmodium)
125B2	Pepin-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
125C2	Pepin-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
125D2	Pepin-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
125E2	Pepin-----	ATiCa-La ATiSa-De	Primary Secondary	Acer-Tilia/Caulophyllum (Laportea) Acer-Tilia/Sanguinaria (Desmodium)
144B2	NewGlarus-----	ArCi-Ph ATiSa-De	Primary Secondary	Acer rubrum/Circaea (Phryma) Acer-Tilia/Sanguinaria (Desmodium)
144C2	NewGlarus-----	ArCi-Ph ATiSa-De	Primary Secondary	Acer rubrum/Circaea (Phryma) Acer-Tilia/Sanguinaria (Desmodium)
144D2	NewGlarus-----	ArCi-Ph ATiSa-De	Primary Secondary	Acer rubrum/Circaea (Phryma) Acer-Tilia/Sanguinaria (Desmodium)
144E	NewGlarus-----	ArCi-Ph ATiSa-De	Primary Secondary	Acer rubrum/Circaea (Phryma) Acer-Tilia/Sanguinaria (Desmodium)
213C2	Hixton-----	ArDe-V ArCi	Primary Secondary	Acer rubrum/Desmodium (Vaccinium) Acer rubrum/Circaea
213D2	Hixton-----	ArDe-V ArCi	Primary Secondary	Acer rubrum/Desmodium (Vaccinium) Acer rubrum/Circaea
213E2	Hixton-----	ArDe-V ArCi	Primary Secondary	Acer rubrum/Desmodium (Vaccinium) Acer rubrum/Circaea
224B	Elevasil-----	PVCr ArDe-V	Primary Secondary	Pinus/Vaccinium-Cornus Acer rubrum/Desmodium (Vaccinium)
224C2	Elevasil-----	PVCr ArDe-V	Primary Secondary	Pinus/Vaccinium-Cornus Acer rubrum/Desmodium (Vaccinium)

Forest Habitat Types--Continued

Map symbol	Soil name(s)	Habitat symbol	Dominance	Short scientific name
224D2	Elevasil-----	PVCr	Primary	Pinus/Vaccinium-Cornus
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
233C	Boone-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
254B2	Norden-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		ArCi	Secondary	Acer rubrum/Circaea
254C2	Norden-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		ArCi	Secondary	Acer rubrum/Circaea
254D2	Norden-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		ArCi	Secondary	Acer rubrum/Circaea
254E2	Norden-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		ArCi	Secondary	Acer rubrum/Circaea
254F	Norden-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		ArCi	Secondary	Acer rubrum/Circaea
255B2	Urne-----	ArCi	Primary	Acer rubrum/Circaea
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
255C2	Urne-----	ArCi	Primary	Acer rubrum/Circaea
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
255D2	Urne-----	ArCi	Primary	Acer rubrum/Circaea
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
255E	Urne-----	ArCi	Primary	Acer rubrum/Circaea
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
255F	Urne-----	ArCi	Primary	Acer rubrum/Circaea
		ArDe-V	Secondary	Acer rubrum/Desmodium (Vaccinium)
265B	Garne-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
265C	Garne-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
303A	Boguscreek-----	AtiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
313D2	Plumcreek-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		AtiSa-De	Secondary	Acer-Tilia/Sanguinaria (Desmodium)
313F	Plumcreek-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		AtiSa-De	Secondary	Acer-Tilia/Sanguinaria (Desmodium)
316B2	Ella-----	AtiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
316C2	Ella-----	AtiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
318A	Bearpen-----	AtiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
326B2	Medary-----	ArCi-Ph	Primary	Acer rubrum/Circaea (Phryma)
		AtiSa-De	Secondary	Acer-Tilia/Sanguinaria (Desmodium)
403A	Dakota-----	AArVb	Primary	Acer saccharum-Acer rubrum/Viburnum
413A	Rasset-----	PVCr	Primary	Pinus/Vaccinium-Cornus
		AArVb	Secondary	Acer saccharum-Acer rubrum/Viburnum
413B	Rasset-----	PVCr	Primary	Pinus/Vaccinium-Cornus
		AArVb	Secondary	Acer saccharum-Acer rubrum/Viburnum
423A	Meridian-----	AArVb	Primary	Acer saccharum-Acer rubrum/Viburnum

Forest Habitat Types--Continued

Map symbol	Soil name(s)	Habitat symbol	Dominance	Short scientific name
423B2	Meridian-----	AArVb	Primary	Acer saccharum-Acer rubrum/Viburnum
429A	Lows-----	Nmin	Primary	N/A (wet mineral upland soils)
432A	Kevilar-----	AArVb PVCr	Primary Secondary	Acer saccharum-Acer rubrum/Viburnum Pinus/Vaccinium-Cornus
432B	Kevilar-----	AArVb PVCr	Primary Secondary	Acer saccharum-Acer rubrum/Viburnum Pinus/Vaccinium-Cornus
432C2	Kevilar-----	AArVb PVCr	Primary Secondary	Acer saccharum-Acer rubrum/Viburnum Pinus/Vaccinium-Cornus
433A	Forkhorn-----	PVCr AArVb	Primary Secondary	Pinus/Vaccinium-Cornus Acer saccharum-Acer rubrum/Viburnum
433B	Forkhorn-----	PVCr AArVb	Primary Secondary	Pinus/Vaccinium-Cornus Acer saccharum-Acer rubrum/Viburnum
433C2	Forkhorn-----	PVCr AArVb	Primary Secondary	Pinus/Vaccinium-Cornus Acer saccharum-Acer rubrum/Viburnum
436A	Rusktown-----	PVCr AArVb	Primary Secondary	Pinus/Vaccinium-Cornus Acer saccharum-Acer rubrum/Viburnum
438A	Hoopeston-----	PVRh PVCr	Primary Secondary	Pinus/Vaccinium-Rubus Pinus/Vaccinium-Cornus
453A	Burkhardt-----	PVCr	Primary	Pinus/Vaccinium-Cornus
453B	Burkhardt-----	PVCr	Primary	Pinus/Vaccinium-Cornus
501A	Finchford-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
501B	Finchford-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
502B2	Chelsea-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
502C2	Chelsea-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
506A	Komro-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
508A	Farrington-----	PVRh PVGy	Primary Secondary	Pinus/Vaccinium-Rubus Pinus/Vaccinium-Gaylussacia
510B	Boplain-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
510C	Boplain-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
510F	Boplain-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
511A	Plainfield-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus
511B	Plainfield-----	PVGy PVCr	Primary Secondary	Pinus/Vaccinium-Gaylussacia Pinus/Vaccinium-Cornus

Forest Habitat Types--Continued

Map symbol	Soil name(s)	Habitat symbol	Dominance	Short scientific name
511C	Plainfield-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
511F	Plainfield-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
512B	Drammen-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
		PVGy	Secondary	Pinus/Vaccinium-Gaylussacia
512C	Drammen-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
		PVGy	Secondary	Pinus/Vaccinium-Gaylussacia
512D	Drammen-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
		PVGy	Secondary	Pinus/Vaccinium-Gaylussacia
516A	Aldo-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
546A	Prissel-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
546B	Prissel-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
546F	Prissel-----	PVHa	Primary	Pinus/Vaccinium-Hamamelis
561B	Tarr-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
566A	Tint-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
589A	Newson-----	Nmin	Primary	N/A (wet mineral upland soils)
616B	Chaseburg-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
626A	Arenzville-----	Noth	Primary	N/A (other map units)
628A	Orion-----	Noth	Primary	N/A (other map units)
629A	Ettrick-----	Nmin	Primary	N/A (wet mineral upland soils)
646A	Dunnbot-----	AArVb	Primary	Acer saccharum-Acer rubrum/Viburnum
		PVCr	Secondary	Pinus/Vaccinium-Cornus
656A	Scotah-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
826B2	Hersey-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
826C2	Hersey-----	ATiCa-La	Primary	Acer-Tilia/Caulophyllum (Laportea)
1135F	Dorerton, Elbaville-----	ArCi	Primary	Acer rubrum/Circaea
		ArCi-Ph	Secondary	Acer rubrum/Circaea (Phryma)
1145F	Gaphill, Rockbluff-----	PVCr	Primary	Pinus/Vaccinium-Cornus
		PVGy	Secondary	Pinus/Vaccinium-Gaylussacia
1155F	Brodale, Bellechester-----	Noth	Primary	N/A (other map units)
1224F	Boone, Elevasil-----	PVGy	Primary	Pinus/Vaccinium-Gaylussacia
		PVCr	Secondary	Pinus/Vaccinium-Cornus
1648A	Northbend, Ettrick-----	Nflp	Primary	N/A (wet mineral flood-plain soils)
1658A	Algansee, Kalmarville-----	Nflp	Primary	N/A (wet mineral flood-plain soils)

Forest Habitat Types--Continued

Map symbol	Soil name(s)	Habitat symbol	Dominance	Short scientific name
2003A	Riverwash-----	Nflp	Primary	N/A (wet mineral flood-plain soils)
2013	Pits-----	Noth	Primary	N/A (other map units)
2014	Pits-----	Noth	Primary	N/A (other map units)
2040	Udipsamments-----	Noth	Primary	N/A (other map units)
2050	Landfill-----	Noth	Primary	N/A (other map units)
W	Water-----	Nwat	Primary	N/A (water)
M-W	Miscellaneous water-----	Nwat	Primary	N/A (water)

Recreation

Pepin County offers a wide variety of outdoor recreational opportunities. Hunting, fishing, camping, canoeing, hiking, snowmobiling, and wildlife viewing are among the most popular.

There are few natural lakes in Pepin County. Rivers, sloughs, and streams are the major areas for water-related recreation. The Mississippi and Chippewa Rivers provide miles of scenic water for canoeing and boating and for fishing for most warm-water species. A number of small streams contain populations of trout. Additionally, Lake Pepin, a natural widening of the Mississippi River, offers many square miles of open water for sailing and other boating enthusiasts.

Bluffs, coulees, and river bottoms provide diverse terrain for hunting, wildlife viewing, hiking, and mushroom picking. Hunting for whitetail deer, turkey, grouse, and waterfowl is popular in the Tiffany Wildlife Area, which is along the Chippewa River near its confluence with the Mississippi River. More than 4,700 acres of public lands, including Nine Mile Natural Area and Lake Pepin State Park, are accessible to the public for a wide range of uses. Arkansas County Park and Silver Birch/Holden County Park also are popular areas for camping, and city and village parks have facilities for picnicking.

Winter sports are available in the form of more than 100 miles of groomed snowmobile trails and many miles of rustic cross-country ski trails. Ice fishing also is popular on lakes and in remote sloughs.

The soils of the survey area are rated in the table "Recreational Development" according to limitations that affect their suitability for recreation. The ratings 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, the ability of the soil to support vegetation, access to water, potential water impoundment sites, and either access to public sewer lines or the capacity of the soil to absorb septic tank effluent. Soils subject to flooding are limited, in varying degrees, for recreational uses by the duration of flooding and the season when it occurs. Onsite assessment of the height, duration,

intensity, and frequency of flooding is essential in planning recreational facilities.

Camp areas are tracts of land used intensively as sites for tents, trailers, and campers and for outdoor activities that accompany such sites. These 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 soils are rated on the basis of soil properties that influence the ease of developing camp areas and performance of the areas after development. Also considered are the soil properties that influence trafficability and promote the growth of vegetation after heavy use.

Picnic areas are natural or landscaped tracts of land that are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation after development. The surface of picnic areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Playgrounds are areas used intensively for baseball, football, or similar activities. These areas require a nearly level soil that is free of stones and that can withstand heavy foot traffic and maintain an adequate cover of vegetation. The soils are rated on the basis of soil properties that influence the cost of shaping the site, trafficability, and the growth of vegetation. Slope and stoniness are the main concerns in developing playgrounds. The surface of the playgrounds should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry.

Paths and trails are areas used for hiking and horseback riding. The areas should require little or no cutting and filling during site preparation. The soils are rated on the basis of soil properties that influence trafficability and erodibility. Paths and trails should remain firm under foot traffic and not be dusty when dry.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be

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

The interpretive ratings in this table help engineers, planners, and others to understand how soil properties influence recreational uses. Ratings for proposed uses are given in terms of limitations. Only the most restrictive features are listed. Other features may limit a specific recreational use.

The degree of soil limitation is expressed as slight, moderate, or severe.

Slight means that soil properties are favorable for the rated use. The limitations are minor and can be easily overcome. Good performance and low maintenance are expected.

Moderate means that soil properties are moderately

favorable for the rated use. The limitations can be overcome or modified by special planning, design, or maintenance. During some part of the year, the expected performance may be less desirable than that of soils rated *slight*.

Severe means that soil properties are unfavorable for the rated use. Examples of limitations are slope, bedrock near the surface, flooding, and a seasonal high water table. These limitations generally require major soil reclamation, special design, or intensive maintenance. Overcoming the limitations generally is difficult and costly.

The information in the table "Recreational Development" can be supplemented by other information in this survey, for example, interpretations for dwellings without basements and for local roads and streets in the table "Building Site Development" and interpretations for septic tank absorption fields in the table "Sanitary Facilities."

Recreational Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
11A: Markey-----	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
20A: Palms-----	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Houghton-----	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
21A: Palms-----	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
40A: Markey-----	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Seelyeville-----	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
114B2: Mt. Carroll-----	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
114C2: Mt. Carroll-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
115B2: Seaton-----	Slight-----	Slight-----	Moderate: slope.	Severe: erodes easily.	Slight.
115C2: Seaton-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
115D2: Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
116C2: Churchtown-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: large stones, slope.
116D2: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
116E: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
125B2: Pepin-----	Slight-----	Slight-----	Moderate: slope.	Severe: erodes easily.	Slight.
125C2: Pepin-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
125D2: Pepin-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
125E2: Pepin-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
144B2: NewGlarus-----	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, depth to rock.	Slight-----	Moderate: depth to rock.
144C2: NewGlarus-----	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope, depth to rock.
144D2: NewGlarus-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
144E: NewGlarus-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
213C2: Hixton-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
213D2: Hixton-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
213E2: Hixton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
224B: Elevasil-----	Slight-----	Slight-----	Moderate: slope, small stones, depth to rock.	Slight-----	Severe: too acid.
224C2: Elevasil-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Severe: too acid.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
224D2: Elevasil-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: too acid, slope.
233C: Boone-----	Severe: too sandy, too acid.	Severe: too sandy, too acid.	Severe: slope, too sandy, too acid.	Severe: too sandy.	Severe: too acid, droughty.
254B2: Norden-----	Slight-----	Slight-----	Moderate: slope, depth to rock.	Slight-----	Moderate: depth to rock.
254C2: Norden-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope, depth to rock.
254D2: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
254E2: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
254F: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255B2: Urne-----	Slight-----	Slight-----	Moderate: slope, small stones, depth to rock.	Slight-----	Moderate: droughty, depth to rock.
255C2: Urne-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: droughty, slope, depth to rock.
255D2: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
255E: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255F: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
265B: Garne-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy, depth to rock.	Moderate: too sandy.	Moderate: droughty, depth to rock.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
265C: Garne-----	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope, depth to rock.
303A: Boguscreek-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight-----	Moderate: flooding.
313D2: Plumcreek-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
313F: Plumcreek-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.	Severe: slope.
316B2: Ella-----	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
316C2: Ella-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
318A: Bearpen-----	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
326B2: Medary-----	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight-----	Slight.
403A: Dakota-----	Slight-----	Slight-----	Slight-----	Slight-----	Slight.
413A: Rasset-----	Slight-----	Slight-----	Moderate: small stones.	Slight-----	Slight.
413B: Rasset-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight-----	Slight.
423A: Meridian-----	Slight-----	Slight-----	Slight-----	Slight-----	Slight.
423B2: Meridian-----	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
429A: Lows-----	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
432A: Kevilar-----	Slight-----	Slight-----	Moderate: small stones.	Slight-----	Slight.
432B: Kevilar-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight-----	Slight.
432C2: Kevilar-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.
433A: Forkhorn-----	Slight-----	Slight-----	Moderate: small stones.	Slight-----	Moderate: droughty.
433B: Forkhorn-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight-----	Moderate: droughty.
433C2: Forkhorn-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: droughty, slope.
436A: Rusktown-----	Slight-----	Slight-----	Moderate: small stones.	Slight-----	Moderate: droughty.
438A: Hoopeston-----	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
453A: Burkhardt-----	Slight-----	Slight-----	Moderate: small stones.	Slight-----	Moderate: droughty.
453B: Burkhardt-----	Slight-----	Slight-----	Moderate: slope, small stones.	Slight-----	Moderate: droughty.
501A: Finchford-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, small stones.	Moderate: too sandy.	Moderate: droughty.
501B: Finchford-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: too sandy, slope, small stones.	Moderate: too sandy.	Moderate: droughty.
502B2: Chelsea-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
502C2: Chelsea-----	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Moderate: droughty, slope.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
506A: Komro-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
508A: Farrington----	Severe: wetness.	Moderate: wetness, too sandy.	Severe: wetness.	Moderate: wetness, too sandy.	Severe: droughty.
510B: Boplain-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
510C: Boplain-----	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
510F: Boplain-----	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: droughty, slope.
511A: Plainfield-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
511B: Plainfield-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
511C: Plainfield-----	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
511F: Plainfield-----	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: droughty, slope.
512B: Drammen-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.	Moderate: droughty.
512C: Drammen-----	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
512D: Drammen-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.
516A: Aldo-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
546A: Prissel-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Moderate: droughty.
546B: Prissel-----	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.	Moderate: droughty.
546F: Prissel-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
561B: Tarr-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too acid.
566A: Tint-----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
589A: Newson-----	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: too acid, ponding, droughty.
616B: Chaseburg-----	Severe: flooding.	Slight-----	Moderate: slope.	Slight-----	Moderate: flooding.
626A: Arenzville-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight-----	Moderate: flooding.
628A: Orion-----	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, flooding.
629A: Ettrick-----	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
646A: Dunnbot-----	Severe: flooding.	Slight-----	Moderate: flooding.	Slight-----	Moderate: flooding.
656A: Scotah-----	Severe: flooding.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Moderate: droughty, flooding.
826B2: Hersey-----	Slight-----	Slight-----	Moderate: slope.	Slight-----	Slight.
826C2: Hersey-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight-----	Moderate: slope.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1135F: Dorerton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Elbaville-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1145F: Gaphill-----	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope.	Severe: too acid, slope.
Rockbluff-----	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope.	Severe: too acid, droughty, slope.
1155F: Brodale-----	Severe: slope, large stones, small stones.	Severe: slope, large stones, small stones.	Severe: large stones, slope, small stones.	Severe: slope, small stones.	Severe: small stones, droughty, slope.
Bellechester----	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: droughty, slope.
Rock outcrop----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope.	Severe: slope, depth to rock.
1224F: Boone-----	Severe: slope, too sandy, too acid.	Severe: slope, too sandy, too acid.	Severe: slope, too sandy, too acid.	Severe: too sandy, slope.	Severe: too acid, droughty, slope.
Elevasil-----	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope, too acid.	Severe: slope.	Severe: too acid, slope.
1648A: Northbend-----	Severe: flooding, wetness, too acid.	Severe: too acid.	Severe: wetness, flooding, too acid.	Moderate: wetness, flooding.	Severe: too acid, flooding.
Ettrick-----	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
1658A: Algansee-----	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: wetness, flooding.	Moderate: wetness, flooding.	Severe: flooding.
Kalmarville----	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
2003A: Riverwash-----	Severe: flooding, wetness, small stones.	Severe: too sandy, small stones.	Severe: too sandy, flooding, small stones.	Severe: too sandy, small stones.	Severe: small stones, flooding.

Recreational Development--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2013: Pits, gravel----	Severe: too sandy, small stones.	Severe: too sandy, small stones.	Severe: too sandy, small stones.	Severe: too sandy, small stones.	Severe: too sandy, small stones, droughty.
2014: Pits, quarry----	Severe: slope.	Severe: slope.	Severe: slope, depth to rock.	Severe: slope, small stones.	Severe: slope, depth to rock.
2040: Udipsamments----	Severe: too sandy.	Severe: too sandy.	Severe: too sandy, slope.	Severe: too sandy.	Moderate: droughty, slope.
2050: Landfill.					

Wildlife Habitat

Robert D. Weihrouch, biologist, Natural Resources Conservation Service, and John Cole, wildlife biologist, Wisconsin Department of Natural Resources, helped prepare this section.

Soils affect wildlife diversity and abundance by influencing natural vegetative diversity and abundance, the availability of water, and possible land uses. The landscape and soils in Pepin County produce an interspersed agricultural land with upland and flood-plain forest, which can be managed for forest products and wildlife. Forest wildlife habitat in the county is quite diverse and abundant, but grassland and wetland wildlife habitat is in need of improvement. The potential for grassland and wetland wildlife is still excellent if the habitats are improved by planting appropriate vegetation, restoring or enhancing wetlands, or promoting the natural establishment of desirable plants.

The characteristics of the seven soil associations in Pepin County that affect wildlife habitat are described in the following paragraphs. These associations are described under the heading "General Soil Map Units" in Part I of this survey.

Association 1.—A significant portion of the Pepin-Dorerton-Churchtown association is made up of very steep forest land. South- and west-facing slopes along the Mississippi River support oak clumps surrounding "goat prairies," which are dry, grassy areas with a variety of forbs. The less sloping ridgetops are used as cropland or pasture. Major tree species in areas of ungrazed forest are northern red oak, white oak, sugar maple, basswood, and upland ash. Eastern redcedar is scattered throughout the steep prairies. The forest land provides excellent habitat for many wildlife species, including whitetail deer, fox squirrel, gray squirrel, gray fox, coyote, wild turkey, ruffed grouse, great horned owl, and pileated woodpecker. Rock outcrops along the river bluffs have provided nesting sites for peregrine falcons in the past and are currently used by turkey vultures. These areas also harbor the timber rattlesnake. The Mississippi River is the major migration corridor in the North American midsection for raptors, waterfowl, and neotropical birds.

Association 2.—Cropland makes up most of the Ella-Orion-Plumcreek association, but areas of this association are dissected by steeper, forested terrace

risers. Tree and shrub species along the drainageways are red maple, American elm, green ash, box elder, willows, beaked hazel, gray dogwood, and round-leaved dogwood. This association provides excellent summer food and cover for such wildlife species as whitetail deer, turkey, coyote, red fox, gray fox, cottontail rabbit, red squirrel, gray squirrel, opossum, raccoon, and striped skunk. Deer and turkey feed in areas of this association during the winter, but they escape to areas of association 1 for cover.

Association 3.—The majority of the Finchford-Plainfield-Burkhardt association is sandy outwash soils of the valley train treads and risers along the Chippewa and Mississippi Rivers. Irrigated cropland is common in this association. A few small, scattered woodlots contain jack pine and northern pin oak. There are also Norway pine plantations and windbreaks. Brittle prickly pear cactus (fig. 21), lupine, butterfly weed, big bluestem, little bluestem, and other native prairie plants are scattered throughout the association on prairie remnants. The federally endangered Karner blue butterfly can be found in lupine areas. Other wildlife, such as whitetail deer, turkey, and Canada goose, feed in areas of this association. Because of a lack of habitat, however, wildlife species are not as diverse or abundant as in the other associations.

Association 4.—Most of the Alganssee-Kalmarville-Scotah association is flood-plain forest with scattered savannas, prairies, and wetlands. The Nine Mile Island Natural Area and the Tiffany Wildlife Area are in this association. Tree and shrub species include river birch, silver maple, red maple, swamp white oak, northern pin oak, cottonwood, black ash, American elm, redosier dogwood, and speckled alder. This association provides excellent nesting habitat for many bird species, including the bald eagle and such cavity nesters as wood duck, hooded merganser, and red-bellied woodpecker. The Chippewa River is an important migration corridor to the Mississippi River for neotropical warblers and migratory raptors, such as red-shouldered hawk, goshawk, peregrine falcon, osprey, bald eagle, and Cooper's hawk. The endangered Massasauga rattlesnake and threatened Blanding's turtle also inhabit the area. The Chippewa



Figure 21.—Brittle prickly pear cactus, a threatened native Wisconsin plant species, grows in some areas of Plainfield sand, 15 to 60 percent slopes.

River, sloughs, oxbows, and tributaries provide habitat for migrating waterfowl and shorebirds and for mink, otter, fisher, muskrat, and beaver. The flood plain, prairie, and savanna are good habitats for whitetail deer, gray fox, gray squirrel, opossum, raccoon, coyote, turkey, ruffed grouse, and woodcock.

Association 5.—Most areas of the Urne-Drammen association are cropland valleys and ridgetops dissected by steeper, forested hillslopes. Major tree species include northern red oak, white oak, cherry, red maple, white ash, white pine, and paper birch. Oak management practices include selective and shelterwood (more than 60 percent canopy removal) cuts. Clearings contain quaking aspen, northern pin oak, and staghorn sumac. Because of the interspersed forest land and cropland, the association provides excellent habitat for many wildlife species, including whitetail deer (fig. 22), ruffed

grouse, turkey, coyote, red fox, gray fox, cottontail rabbit, fox squirrel, gray squirrel, opossum, raccoon, and striped skunk.

Association 6.—Drained cropland with scattered wetlands and wet drainageways dominate the Markey-Farrington-Aldo association. The Big Swamp Wildlife Area, along Bear Creek, is in this association. Tree species along the wet drainageways are silver maple, red maple, American elm, green ash, and box elder. Wet-ground shrub communities, or shrub-carrs, contain willows, redosier dogwood, and speckled alder. The better drained sites support mainly northern pin oak and scattered Norway pine and white pine plantations. Wetlands with surrounding cropped or grassy uplands provide excellent habitat for waterfowl, muskrat, mink, shorebirds, and sandhill crane. Wetland areas fringed with trees support beaver, otter, woodcock, raccoon, opossum, ruffed grouse, gray fox,

coyote, turkey, and whitetail deer. Shrub-carrs and cattail marshes provide good winter cover for remnant populations of ring-necked pheasant.

Association 7.—Most areas of the Norden-Seaton association are used as cropland. Areas that are too steep or sandy to be plowed are generally used for pasture or left as forest land. Attempts have been made to drain or fill nearly all wetland areas. Northern red oak and sugar maple are the major tree species; white pine, white ash, red maple, and quaking aspen are less common. Drainageways contain willows and speckled alder. The mixture of oak woodlots, wet areas, and cropland provides excellent habitat for whitetail deer, ruffed grouse, wild turkey, fox squirrel, gray squirrel, raccoon, badger, striped skunk, opossum, coyote, red fox, and cottontail rabbit. Excessive grazing has degraded forest-land habitat in some locations and thus has reduced the diversity and abundance of wildlife. Shrub-carrs and cattail marsh areas provide winter cover for the few wild pheasants that currently inhabit areas of this association.

The potential of the soils in Pepin County for providing important habitat elements and various kinds of wildlife habitat is given in the table “Wildlife Habitat” at the end of this section.

Elements of Wildlife Habitat

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants used by wildlife. Examples are corn, soybeans, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes planted for wildlife food and cover. Examples are bromegrass, timothy, orchardgrass, clover, alfalfa, wheatgrass, and birdsfoot trefoil.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds, that provide food and cover for wildlife. Examples are



Figure 22.—Habitat diversity in the Urne-Drammen association provides for a thriving whitetail deer population.

bluestems, indiagrass, blueberry, goldenrod, lambsquarters, dandelions, blackberry, ragweed, wheatgrass, and nightshade.

The major soil properties affecting the growth of grain and forage crops and wild herbaceous plants are depth of the root zone, texture of the surface layer, the amount of water available to plants, wetness, salinity, and flooding. The length of the growing season also is important.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage that wildlife eat. Examples are oak, poplar, box elder, birch, maple, green ash, willow, and American elm. Examples of fruit-producing shrubs that are suitable for planting on soils that have good potential for these plants are hawthorn, honeysuckle, American plum, redosier dogwood, chokecherry, highbush cranberry, elderberry, gooseberry, serviceberry, silver buffaloberry, and crabapple.

Coniferous plants are cone-bearing trees, shrubs, or ground cover that provide habitat or supply food in the form of browse, seed, or fruit-like cones. Examples are pine, spruce, cedar, and tamarack.

The major soil properties affecting the growth of hardwood and coniferous trees and shrubs are depth of the root zone, the amount of water available to plants, and wetness.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Wetland plants produce food or cover for wetland wildlife. Examples of these plants are smartweeds, wild millet, rushes, sedges, bulrushes, wild rice, arrowhead, waterplantain, cattail, prairie cordgrass, bluejoint grass, asters, and beggarticks.

The major soil properties affecting wetland plants

are texture of the surface layer, wetness, acidity or alkalinity, and slope.

Shallow water areas have an average depth of less than 5 feet. They are useful as habitat for some wildlife species. They are naturally wet areas or are created by dams, levees, or water-control measures in marshes or streams. Examples are waterfowl feeding areas, wildlife watering developments, beaver ponds, and other wildlife ponds.

The major soil properties affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability.

Kinds of Wildlife Habitat

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, and shrubs. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include Hungarian partridge, ring-necked pheasant, bobwhite quail, sharp-tailed grouse, meadowlark, field sparrow, killdeer, cottontail rabbit, and red fox.

Habitat for woodland wildlife consists of areas of hardwoods or conifers or a mixture of these and associated grasses, legumes, and wild herbaceous plants. The wildlife attracted to this habitat include wild turkey, ruffed grouse, thrushes, woodpeckers, owls, tree squirrels, porcupine, raccoon, whitetail deer, black bear, and moose.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas, bogs, or flood plains that support water-tolerant plants. The wildlife attracted to this habitat include ducks, geese, herons, bitterns, rails, kingfishers, muskrat, otter, mink, and beaver.

Wildlife Habitat

Map symbol and soil name	Potential for habitat elements						Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
11A: Markey-----	Very poor.	Very poor.	Poor	Very poor.	Poor	Good	Good	Poor	Very poor.	Good.
20A: Palms-----	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Houghton-----	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
21A: Palms-----	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
40A: Markey-----	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Seelyeville-----	Very poor.	Poor	Good	Poor	Poor	Good	Good	Fair	Poor	Good.
114B2: Mt. Carroll-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
114C2: Mt. Carroll-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
115B2: Seaton-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
115C2: Seaton-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
115D2: Seaton-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
116C2: Churchtown-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
116D2: Churchtown-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
116E: Churchtown-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
125B2: Pepin-----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
125C2: Pepin-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
125D2: Pepin-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
125E2: Pepin-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
144B2: NewGlarus-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
144C2: NewGlarus-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
144D2: NewGlarus-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
144E: NewGlarus-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
213C2: Hixton-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
213D2: Hixton-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
213E2: Hixton-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
224B: Elevasil-----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
224C2: Elevasil-----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Fair	Very poor.
224D2: Elevasil-----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
233C: Boone-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
254B2: Norden-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
254C2: Norden-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
254D2: Norden-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
254E2: Norden-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
254F: Norden-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
255B2: Urne-----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
255C2: Urne-----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
255D2: Urne-----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
255E: Urne-----	Very poor.	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
255F: Urne-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
265B: Garne-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
265C: Garne-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
303A: Boguscreek----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Very poor.
313D2: Plumcreek-----	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
313F: Plumcreek-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.
316B2: Ella-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
316C2: Ella-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
318A: Bearpen-----	Good	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
326B2: Medary-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
403A: Dakota-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
413A: Rasset-----	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
413B: Rasset-----	Fair	Good	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
423A: Meridian-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
423B2: Meridian-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
429A: Lows-----	Fair	Good	Good	Good	Fair	Good	Good	Good	Good	Good.
432A: Kevilar-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
432B: Kevilar-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
432C2: Kevilar-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
433A: Forkhorn-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
433B: Forkhorn-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
433C2: Forkhorn-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
436A: Rusktown-----	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
438A: Hoopeston-----	Fair	Good	Good	Good	Good	Fair	Poor	Good	Good	Poor.
453A: Burkhardt-----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
453B: Burkhardt-----	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
501A: Finchford-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
501B: Finchford-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
502B2: Chelsea-----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
502C2: Chelsea-----	Very poor.	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
506A: Komro-----	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
508A: Farrington-----	Poor	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Poor	Poor.
510B: Boplain-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
510C: Boplain-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
510F: Boplain-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
511A: Plainfield-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
511B: Plainfield-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
511C: Plainfield-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
511F: Plainfield-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
512B: Drammen-----	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
512C: Drammen-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
512D: Drammen-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.

Wildlife Habitat--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life
516A: Aldo-----	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
546A: Prissel-----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
546B: Prissel-----	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
546F: Prissel-----	Very poor.	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
561B: Tarr-----	Poor	Poor	Good	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
566A: Tint-----	Poor	Poor	Good	Poor	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
589A: Newson-----	Fair	Fair	Fair	Poor	Poor	Good	Good	Fair	Poor	Good.
616B: Chaseburg-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
626A: Arenzville-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
628A: Orion-----	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Good.
629A: Ettrick-----	Good	Good	Fair	Good	Fair	Good	Good	Good	Good	Good.
646A: Dunnbot-----	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
656A: Scotah-----	Fair	Fair	Good	Good	Good	Poor	Very poor.	Fair	Good	Very poor.
826B2: Hersey-----	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
826C2: Hersey-----	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
1135F: Dorerton-----	Very poor.	Poor	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.
Elbaville-----	Very poor.	Poor	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.

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 estimated data and test data in the "Soil Properties" section.

Information in the "Engineering" 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 within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

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

Government ordinances and regulations that restrict 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 grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about the kinds of clay minerals, the 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, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; 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 table "Building Site Development" shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and

observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrinking and swelling, and organic layers can cause the movement of footings. A high water table, depth to bedrock, large stones, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

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 stabilized soil material; and a flexible or rigid surface. Cuts and fills generally are limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, potential for frost action, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock, the available water capacity in the upper 40 inches, and the content of salts affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

The table "Sanitary Facilities" shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary

landfills. It also shows the suitability of the soils for use as a daily cover for landfill.

Soil properties are important in selecting sites for sanitary facilities and in identifying limiting soil properties and site features to be considered in planning, design, and installation. Soil limitation ratings of *slight*, *moderate*, or *severe* are given for septic tank absorption fields, sewage lagoons, and trench and area sanitary landfills. Soil suitability ratings of *good*, *fair*, and *poor* are given for daily cover for landfill.

A rating of *slight* or *good* indicates that the soils have no limitations or that the limitations can be easily overcome. Good performance and low maintenance can be expected. A rating of *moderate* or *fair* indicates that the limitations should be recognized but generally can be overcome by good management or special design. A rating of *severe* or *poor* indicates that overcoming the limitations is difficult or impractical. Increased maintenance may be required.

Septic tank absorption fields are areas in which subsurface systems of tile or perforated pipe distribute effluent from a septic tank into the natural soil. The centerline of the tile is assumed to be at a depth of 24 inches. Only the part of the soil between depths of 24 and 60 inches is considered in making the ratings. The soil properties and site features considered are those that affect the absorption of the effluent, those that affect the construction and maintenance of the system, and those that may affect public health.

The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to 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, relatively impervious soil material. Aerobic lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Relatively impervious soil material for the lagoon floor and sides

is desirable to minimize seepage and contamination of local ground water.

The table gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive 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 and bedrock can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Trench sanitary landfill is an area where solid waste is disposed of by placing refuse in successive layers in an excavated trench. The waste is spread, compacted, and covered daily with a thin layer of soil that is excavated from the trench. When the trench is full, a final cover of soil material at least 2 feet thick is placed over the landfill. Soil properties that influence the risk of pollution, the ease of excavation, trafficability, and revegetation are the major considerations in rating the soils.

Area sanitary landfill is an area where solid waste is disposed of by placing refuse in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil that is imported from a source away from the site. A final cover of soil at least 2 feet thick is placed over the completed landfill. Soil properties that influence trafficability, revegetation, and the risk of pollution are the main considerations in rating the soils for area sanitary landfills.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. The ratings in the table are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts affect trench landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

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 suitability of a soil for use as cover is based on properties that affect workability and the ease of digging, moving, and spreading the material over the refuse daily during both wet and dry periods.

Soil texture, wetness, rock fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to wind erosion.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Waste Management

Soil properties are important when organic waste is applied as fertilizer and wastewater is applied in irrigated areas. They also are important when the soil is used as a medium for the treatment and disposal of the organic waste and wastewater. Unfavorable soil properties can result in environmental damage.

The use of organic waste and wastewater as production resources results in energy and resource conservation and minimizes the problems associated with waste disposal. If disposal is the goal, applying a maximum amount of the organic waste or the wastewater to a minimal area holds costs to a minimum and environmental damage is the main hazard. If reuse is the goal, a minimum amount should be applied to a maximum area and environmental damage is unlikely.

Interpretations developed for waste management may include ratings for manure- and food-processing waste, municipal sewage sludge, use of wastewater for irrigation, and treatment of wastewater by slow rate, overland flow, and rapid infiltration processes.

Specific information regarding waste management is available at the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Construction Materials

The table "Construction Materials" gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good*, *fair*, or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In the 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 soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high 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 engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel, or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have one or more of the following characteristics: a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet and have a water table at a depth of less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications for each use vary widely. In the table, only the probability of finding material in suitable quantity in or below the soil is evaluated. The suitability of the

material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

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

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is as much as 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

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.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

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

Water Management

The table “Water Management” 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 limitations are considered *slight* if soil properties and site features generally are favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

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. In the 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 more 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.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and the potential for frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock. The performance of a system is affected by the depth of the root zone, the amount of salts, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff.

Slope, wetness, large stones, and depth to bedrock affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind erosion or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances (such as salts), and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Building Site Development

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
11A: Markey-----	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
20A: Palms-----	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Houghton-----	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
21A: Palms-----	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
40A: Markey-----	Severe: cutbanks cave, excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
Seelyeville-----	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
114B2: Mt. Carroll-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
114C2: Mt. Carroll-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
115B2: Seaton-----	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
115C2: Seaton-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
115D2: Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
116C2: Churchtown-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: large stones, slope.
116D2: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
116E: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
125B2: Pepin-----	Moderate: depth to rock, too clayey.	Moderate: shrink-swell.	Moderate: depth to rock, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
125C2: Pepin-----	Moderate: depth to rock, too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
125D2: Pepin-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
125E2: Pepin-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
144B2: NewGlarus-----	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Moderate: depth to rock.
144C2: NewGlarus-----	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope, depth to rock.
144D2: NewGlarus-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
144E: NewGlarus-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
213C2: Hixton-----	Severe: cutbanks cave.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope.	Severe: slope.	Severe: frost action.	Moderate: slope, depth to rock.
213D2: Hixton-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
213E2: Hixton-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
224B: Elevasil-----	Severe: cutbanks cave.	Slight-----	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Severe: too acid.
224C2: Elevasil-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Severe: too acid.
224D2: Elevasil-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.
233C: Boone-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Severe: too acid, droughty.
254B2: Norden-----	Slight-----	Moderate: shrink-swell.	Moderate: depth to rock.	Moderate: shrink-swell, slope.	Severe: frost action.	Moderate: depth to rock.
254C2: Norden-----	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: depth to rock, slope.	Severe: slope.	Severe: frost action.	Moderate: slope, depth to rock.
254D2: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
254E2: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
254F: Norden-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
255B2: Urne-----	Moderate: depth to rock.	Slight-----	Moderate: depth to rock.	Moderate: slope.	Moderate: frost action.	Moderate: droughty, depth to rock.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
255C2: Urne-----	Moderate: depth to rock, slope.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope, depth to rock.
255D2: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255E: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
255F: Urne-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
265B: Garne-----	Severe: cutbanks cave.	Slight-----	Moderate: depth to rock.	Moderate: slope.	Slight-----	Moderate: droughty, depth to rock.
265C: Garne-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope, depth to rock.
303A: Boguscreek-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
313D2: Plumcreek-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
313F: Plumcreek-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, frost action.	Severe: slope.
316B2: Ella-----	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
316C2: Ella-----	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
318A: Bearpen-----	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, frost action.	Moderate: wetness.
326B2: Medary-----	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
403A: Dakota-----	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell.	Severe: frost action.	Slight.
413A: Rasset-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Moderate: frost action.	Slight.
413B: Rasset-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.	Slight.
423A: Meridian-----	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell.	Severe: frost action.	Slight.
423B2: Meridian-----	Severe: cutbanks cave.	Moderate: shrink-swell.	Slight-----	Moderate: shrink-swell, slope.	Severe: frost action.	Slight.
429A: Lows-----	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding.
432A: Kevilar-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Moderate: frost action.	Slight.
432B: Kevilar-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Moderate: slope.	Moderate: frost action.	Slight.
432C2: Kevilar-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
433A: Forkhorn-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Moderate: frost action.	Moderate: droughty.
433B: Forkhorn-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.	Moderate: droughty.
433C2: Forkhorn-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: droughty, slope.
436A: Rusktown-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Moderate: frost action.	Moderate: droughty.
438A: Hoopeston-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
453A: Burkhardt-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
453B: Burkhardt-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
501A: Finchford-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
501B: Finchford-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
502B2: Chelsea-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Moderate: droughty.
502C2: Chelsea-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
506A: Komro-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
508A: Farrington-----	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Severe: droughty.
510B: Boplain-----	Severe: cutbanks cave.	Slight-----	Moderate: depth to rock.	Slight-----	Slight-----	Severe: droughty.
510C: Boplain-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: depth to rock, slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
510F: Boplain-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
511A: Plainfield-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: droughty.
511B: Plainfield-----	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: slope.	Slight-----	Severe: droughty.
511C: Plainfield-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
511F: Plainfield-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
512B: Drammen-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Moderate: droughty.
512C: Drammen-----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
512D: Drammen-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
516A: Aldo-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
546A: Prissel-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Moderate: droughty.
546B: Prissel-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Moderate: slope.	Slight-----	Moderate: droughty.
546F: Prissel-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
561B: Tarr-----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: too acid.
566A: Tint-----	Severe: cutbanks cave.	Slight-----	Moderate: wetness.	Slight-----	Slight-----	Severe: droughty.
589A: Newson-----	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: too acid, ponding, droughty.
616B: Chaseburg-----	Moderate: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
626A: Arenzville-----	Moderate: wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding, frost action.	Moderate: flooding.
628A: Orion-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, flooding, frost action.	Moderate: wetness, flooding.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
629A: Ettrick-----	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
646A: Dunnbot-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
656A: Scotah-----	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: droughty, flooding.
826B2: Hersey-----	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength, frost action.	Slight.
826C2: Hersey-----	Moderate: wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
1135F: Dorerton-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Elbaville-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1145F: Gaphill-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.
Rockbluff-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, droughty, slope.
1155F: Brodale-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: small stones, droughty, slope.
Bellechester----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Rock outcrop----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.

Building Site Development--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
1224F: Boone-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, droughty, slope.
Elevasil-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: too acid, slope.
1648A: Northbend-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, frost action.	Severe: too acid, flooding.
Ettrick-----	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
1658A: Alganssee-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.
Kalmarville----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding, frost action.	Severe: wetness, flooding.
2003A: Riverwash-----	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: small stones, flooding.
2013: Pits, gravel----	Severe: cutbanks cave.	Slight-----	Slight-----	Slight-----	Slight-----	Severe: too sandy, small stones, droughty.
2014: Pits, quarry----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: depth to rock, slope.	Severe: slope, depth to rock.
2040: Udipsamments----	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
2050: Landfill.						

Sanitary Facilities

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
11A: Markey-----	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
20A: Palms-----	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Houghton-----	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
21A: Palms-----	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, ponding, excess humus.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
40A: Markey-----	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Seelyeville-----	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
114B2: Mt. Carroll-----	Slight-----	Moderate: seepage, slope.	Slight-----	Slight-----	Good.
114C2: Mt. Carroll-----	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
115B2: Seaton-----	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----	Slight-----	Good.
115C2: Seaton-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
115D2: Seaton-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
116C2: Churchtown-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
116D2: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
116E: Churchtown-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
125B2: Pepin-----	Severe: percs slowly.	Moderate: seepage, depth to rock, slope.	Severe: depth to rock.	Moderate: depth to rock.	Fair: depth to rock, thin layer.
125C2: Pepin-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: depth to rock, slope, thin layer.
125D2: Pepin-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
125E2: Pepin-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
144B2: NewGlarus-----	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.
144C2: NewGlarus-----	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock, thin layer.
144D2: NewGlarus-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope, thin layer.
144E: NewGlarus-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope, thin layer.
213C2: Hixton-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
213D2: Hixton-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
213E2: Hixton-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, slope.
224B: Elevasil-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
224C2: Elevasil-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, small stones.
224D2: Elevasil-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
233C: Boone-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, too sandy.
254B2: Norden-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
254C2: Norden-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
254D2: Norden-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
254E2: Norden-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
254F: Norden-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
255B2: Urne-----	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
255C2: Urne-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: depth to rock.
255D2: Urne-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
255E: Urne-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
255F: Urne-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
265B: Garne-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock.	Severe: depth to rock, seepage.	Poor: depth to rock.
265C: Garne-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock, seepage.	Poor: depth to rock.
303A: Boguscreek-----	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage.	Severe: flooding.	Fair: thin layer.
313D2: Plumcreek-----	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
313F: Plumcreek-----	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
316B2: Ella-----	Severe: wetness.	Moderate: seepage, slope, wetness.	Moderate: wetness, too clayey.	Slight-----	Fair: too clayey.
316C2: Ella-----	Severe: wetness.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
318A: Bearpen-----	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
326B2: Medary-----	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: too clayey.	Moderate: wetness.	Poor: too clayey, hard to pack.
403A: Dakota-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
413A: Rasset-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
413B: Rasset-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
423A: Meridian-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
423B2: Meridian-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
429A: Lows-----	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
432A: Kevilar-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
432B: Kevilar-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
432C2: Kevilar-----	Severe: wetness, poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
433A: Forkhorn-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
433B: Forkhorn-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
433C2: Forkhorn-----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
436A: Rusktown-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
438A: Hoopeston-----	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
453A: Burkhardt-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
453B: Burkhardt-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
501A: Finchford-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
501B: Finchford-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
502B2: Chelsea-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
502C2: Chelsea-----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
506A: Komro-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
508A: Farrington-----	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
510B: Boplain-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, too sandy.
510C: Boplain-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: depth to rock, seepage, too sandy.
510F: Boplain-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, seepage, too sandy.
511A: Plainfield-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
511B: Plainfield-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
511C: Plainfield-----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
511F: Plainfield-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
512B: Drammen-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
512C: Drammen-----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
512D: Drammen-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
516A: Aldo-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
546A: Prissel-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
546B: Prissel-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
546F: Prissel-----	Severe: wetness, poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
561B: Tarr-----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
566A: Tint-----	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
589A: Newson-----	Severe: ponding, poor filter.	Severe: seepage.	Severe: seepage, ponding.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
616B: Chaseburg-----	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Good.
626A: Arenzville-----	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Good.
628A: Orion-----	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
629A: Ettrick-----	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: too sandy, ponding.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
646A: Dunnbot-----	Severe: flooding, wetness.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Fair: thin layer.
656A: Scotah-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy, small stones.
826B2: Hersey-----	Severe: wetness, percs slowly.	Moderate: seepage, slope, wetness.	Moderate: wetness.	Slight-----	Good.
826C2: Hersey-----	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: slope.	Fair: slope.
1135F: Dorerton-----	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope.	Poor: seepage, small stones, slope.
Elbaville-----	Severe: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, large stones.
1145F: Gaphill-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: slope, thin layer.
Rockbluff-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1155F: Brodale-----	Severe: slope.	Severe: seepage, slope, large stones.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Bellechester----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: depth to rock, seepage, slope.	Severe: seepage, slope.	Poor: seepage, too sandy, large stones.
Rock outcrop----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope, thin layer.

Sanitary Facilities--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
1224F: Boone-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, seepage, too sandy.
Elevasil-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: depth to rock, small stones, slope.
1648A: Northbend-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness, too acid.
Ettrick-----	Severe: flooding, ponding, percs slowly.	Severe: seepage, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: too sandy, ponding.
1658A: Alganssee-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: too sandy, wetness.
Kalmarville----	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: wetness.
2003A: Riverwash-----	Severe: flooding, wetness, poor filter.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, small stones.
2013: Pits, gravel----	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: seepage, too sandy, small stones.
2014: Pits, quarry----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: depth to rock, slope.
2040: Udipsamments----	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
2050: Landfill.					

Construction Materials

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
11A: Markey-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: excess humus, wetness.
20A: Palms-----	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
Houghton-----	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
21A: Palms-----	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
40A: Markey-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: excess humus, wetness.
Seelyeville-----	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
114B2: Mt. Carroll-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
114C2: Mt. Carroll-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
115B2: Seaton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
115C2: Seaton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
115D2: Seaton-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
116C2: Churchtown-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
116D2: Churchtown-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
116E: Churchtown-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
125B2: Pepin-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim.
125C2: Pepin-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, slope.
125D2: Pepin-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
125E2: Pepin-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
144B2: NewGlarus-----	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, large stones, thin layer.
144C2: NewGlarus-----	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, large stones, thin layer.
144D2: NewGlarus-----	Poor: depth to rock, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
144E: NewGlarus-----	Poor: depth to rock, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
213C2: Hixton-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
213D2: Hixton-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
213E2: Hixton-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
224B: Elevasil-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
224C2: Elevasil-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
224D2: Elevasil-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
233C: Boone-----	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones.
254B2: Norden-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
254C2: Norden-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, small stones, thin layer.
254D2: Norden-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
254E2: Norden-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
254F: Norden-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
255B2: Urne-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
255C2: Urne-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
255D2: Urne-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
255E: Urne-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
255F: Urne-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
265B: Garne-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too sandy, small stones.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
265C: Garne-----	Poor: depth to rock.	Improbable: excess fines.	Improbable: excess fines.	Fair: depth to rock, too sandy, small stones.
303A: Boguscreek-----	Fair: low strength.	Probable-----	Improbable: too sandy.	Fair: small stones, area reclaim.
313D2: Plumcreek-----	Fair: shrink-swell, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
313F: Plumcreek-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
316B2: Ella-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
316C2: Ella-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, slope.
318A: Bearpen-----	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
326B2: Medary-----	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
403A: Dakota-----	Good-----	Probable-----	Probable-----	Poor: area reclaim.
413A: Rasset-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
413B: Rasset-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
423A: Meridian-----	Good-----	Probable-----	Probable-----	Poor: area reclaim.
423B2: Meridian-----	Good-----	Probable-----	Probable-----	Poor: area reclaim.
429A: Lows-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: wetness.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
432A: Kevilar-----	Good-----	Improbable: thin layer.	Improbable: too sandy.	Fair: small stones, thin layer.
432B: Kevilar-----	Good-----	Improbable: thin layer.	Improbable: too sandy.	Fair: small stones, thin layer.
432C2: Kevilar-----	Good-----	Improbable: thin layer.	Improbable: too sandy.	Fair: small stones, thin layer, slope.
433A: Forkhorn-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
433B: Forkhorn-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
433C2: Forkhorn-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
436A: Rusktown-----	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
438A: Hoopeston-----	Fair: wetness.	Probable-----	Improbable: too sandy.	Fair: small stones.
453A: Burkhardt-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
453B: Burkhardt-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
501A: Finchford-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
501B: Finchford-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
502B2: Chelsea-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
502C2: Chelsea-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
506A: Komro-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones.
508A: Farrington-----	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy.
510B: Boplain-----	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones.
510C: Boplain-----	Poor: depth to rock.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones.
510F: Boplain-----	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones, slope.
511A: Plainfield-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
511B: Plainfield-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
511C: Plainfield-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
511F: Plainfield-----	Poor: slope.	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
512B: Drammen-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
512C: Drammen-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
512D: Drammen-----	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: too sandy, slope.
516A: Aldo-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.
546A: Prissel-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
546B: Prissel-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
546F: Prissel-----	Poor: slope.	Probable-----	Improbable: too sandy.	Poor: too sandy, slope.
561B: Tarr-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy, too acid.
566A: Tint-----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
589A: Newson-----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: too sandy, small stones, wetness.
616B: Chaseburg-----	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
626A: Arenzville-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Good.
628A: Orion-----	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
629A: Ettrick-----	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
646A: Dunnbot-----	Good-----	Probable-----	Improbable: too sandy.	Fair: area reclaim.
656A: Scotah-----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
826B2: Hersey-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
826C2: Hersey-----	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
1135F: Dorerton-----	Poor: slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: small stones, area reclaim, slope.
Elbaville-----	Poor: slope.	Improbable: large stones.	Improbable: large stones.	Poor: area reclaim, small stones, slope.
1145F: Gaphill-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Rockbluff-----	Poor: slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones, area reclaim.
1155F: Brodale-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Bellechester----	Poor: slope.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, large stones, area reclaim.
Rock outcrop----	Poor: depth to rock, thin layer, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: depth to rock.
1224F: Boone-----	Poor: depth to rock, slope.	Improbable: thin layer.	Improbable: thin layer.	Poor: too sandy, small stones, slope.
Elevasil-----	Poor: depth to rock, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
1648A: Northbend-----	Fair: wetness.	Probable-----	Improbable: too sandy.	Poor: area reclaim, too acid.
Ettrick-----	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

Construction Materials--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1658A: Alganssee-----	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, small stones.
Kalmarville----	Poor: wetness.	Probable-----	Improbable: too sandy.	Poor: wetness.
2003A: Riverwash-----	Fair: wetness.	Improbable: small stones.	Probable-----	Poor: small stones.
2013: Pits, gravel----	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones.
2014: Pits, quarry----	Poor: depth to rock, slope.	Improbable: excess fines, thin layer.	Improbable: excess fines, thin layer.	Poor: depth to rock, area reclaim.
2040: Udipsamments----	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy.
2050: Landfill.				

Water Management

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. See text for definitions of terms used in this table. Absence of an entry indicates that no rating is applicable)

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
11A: Markey-----	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, too sandy, soil blowing.	Wetness.
20A: Palms-----	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
Houghton-----	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding-----	Ponding-----	Wetness.
21A: Palms-----	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing.	Wetness.
40A: Markey-----	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
Seelyeville----	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
114B2: Mt. Carroll----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
114C2: Mt. Carroll----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
115B2: Seaton-----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
115C2: Seaton-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
115D2: Seaton-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
116C2: Churchtown-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
116D2: Churchtown-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
116E: Churchtown-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
125B2: Pepin-----	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Erodes easily	Erodes easily.
125C2: Pepin-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
125D2: Pepin-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
125E2: Pepin-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, percs slowly, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
144B2: NewGlarus-----	Moderate: seepage, slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
144C2: NewGlarus-----	Severe: slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
144D2: NewGlarus-----	Severe: slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
144E: NewGlarus-----	Severe: slope.	Severe: thin layer, piping.	Severe: no water.	Deep to water	Slope, percs slowly, depth to rock.	Slope, area reclaim, erodes easily.	Slope, erodes easily, depth to rock.
213C2: Hixton-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
213D2: Hixton-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
213E2: Hixton-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
224B: Elevasil-----	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Depth to rock, soil blowing.	Droughty, depth to rock.
224C2: Elevasil-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
224D2: Elevasil-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
233C: Boone-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
254B2: Norden-----	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.
254C2: Norden-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
254D2: Norden-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
254E2: Norden-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
254F: Norden-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, depth to rock, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
255B2: Urne-----	Moderate: seepage, depth to rock, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Depth to rock	Droughty, depth to rock.
255C2: Urne-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
255D2: Urne-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
255E: Urne-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
255F: Urne-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, depth to rock.	Slope, depth to rock.	Slope, droughty, depth to rock.
265B: Garne-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, depth to rock.	Droughty, depth to rock.
265C: Garne-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, slope, depth to rock.	Slope, droughty, depth to rock.
303A: Boguscreek-----	Severe: seepage.	Severe: piping.	Severe: no water.	Deep to water	Flooding-----	Favorable-----	Favorable.
313D2: Plumcreek-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily.
313F: Plumcreek-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily, too sandy.	Slope, erodes easily.
316B2: Ella-----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
316C2: Ella-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
318A: Bearpen-----	Moderate: seepage.	Severe: piping.	Severe: no water.	Frost action---	Wetness-----	Erodes easily, wetness.	Wetness, erodes easily.
326B2: Medary-----	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, percs slowly.
403A: Dakota-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
413A: Rasset-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Soil blowing---	Too sandy, soil blowing.	Favorable.
413B: Rasset-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.	Favorable.
423A: Meridian-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Erodes easily	Erodes easily, too sandy.	Erodes easily.
423B2: Meridian-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily, too sandy.	Erodes easily.
429A: Lows-----	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Cutbanks cave, ponding, flooding.	Ponding, flooding.	Too sandy, ponding.	Wetness.
432A: Kevilar-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Soil blowing---	Too sandy, soil blowing.	Favorable.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
432B: Kevilar-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Too sandy, soil blowing.	Favorable.
432C2: Kevilar-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, too sandy, soil blowing.	Slope.
433A: Forkhorn-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, soil blowing.	Soil blowing---	Droughty.
433B: Forkhorn-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Soil blowing---	Droughty.
433C2: Forkhorn-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, soil blowing.	Slope, droughty.
436A: Rusktown-----	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, soil blowing.	Soil blowing---	Droughty.
438A: Hoopeston-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action---	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
453A: Burkhardt-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.
453B: Burkhardt-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty, rooting depth.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
501A: Finchford-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
501R: Finchford-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
502B2: Chelsea-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
502C2: Chelsea-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
506A: Komro-----	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
508A: Farrington-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
510B: Boplain-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Depth to rock, too sandy.	Droughty, depth to rock.
510C: Boplain-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
510F: Boplain-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
511A: Plainfield-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
511B: Plainfield-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
511C: Plainfield-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
511F: Plainfield-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
512B: Drammen-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
512C: Drammen-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
512D: Drammen-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
516A: Aldo-----	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
546A: Prissel-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
546B: Prissel-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
546F: Prissel-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
561B: Tarr-----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
566A: Tint-----	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
589A: Newson-----	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
616B: Chaseburg-----	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
626A: Arenzville-----	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
628A: Orion-----	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action.	Wetness-----	Erodes easily, wetness.	Wetness, erodes easily.
629A: Ettrick-----	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding-----	Wetness.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
646A: Dunnbot-----	Severe: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Soil blowing, flooding.	Soil blowing---	Favorable.
656A: Scotah-----	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
826B2: Hersey-----	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
826C2: Hersey-----	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
1135F: Dorerton-----	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones, too sandy.	Large stones, slope.
Elbaville-----	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, large stones.	Slope, large stones, erodes easily.	Large stones, slope, erodes easily.
1145F: Gaphill-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, soil blowing.	Slope, droughty.
Rockbluff-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1155F: Brodale-----	Severe: seepage, slope.	Severe: seepage, large stones.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones.	Large stones, slope, droughty.
Bellechester----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, large stones, droughty.	Slope, large stones, too sandy.	Large stones, slope, droughty.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
1155F: Rock outcrop----	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water, depth to rock.	Deep to water, depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
1224F: Boone-----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
Elevasil-----	Severe: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, depth to rock, soil blowing.	Slope, droughty, depth to rock.
1648A: Northbend-----	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action, too acid.	Flooding, too acid.	Erodes easily, wetness.	Wetness, erodes easily.
Ettrick-----	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding, too sandy.	Wetness.
1658A: Alganssee-----	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Wetness, droughty.
Kalmarville----	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Flooding, frost action.	Wetness, flooding.	Wetness-----	Wetness.
2003A: Riverwash-----	Severe: seepage.	Severe: seepage.	Moderate: cutbanks cave.	Cutbanks cave, flooding.	Wetness, droughty, flooding.	Too sandy, large stones, wetness.	Large stones, wetness, droughty.
2013: Pits, gravel----	Severe: seepage.	Severe: seepage.	Severe: no water.	Cutbanks cave, deep to water.	Fast intake, droughty.	Too sandy-----	Droughty.

Water Management--Continued

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2014: Pits, quarry----	Severe: depth to rock, slope.	Severe: thin layer.	Severe: no water, depth to rock.	Deep to water, depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.	Slope, depth to rock.
2040: Udipsamments----	Severe: seepage, slope.	Severe: seepage.	Severe: cutbanks cave, no water.	Cutbanks cave, deep to water, slope.	Fast intake, slope, droughty.	Too sandy, slope, soil blowing.	Slope, droughty.
2050: Landfill.							

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

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 grain-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 shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

The table "Engineering Index Properties" gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the series descriptions in Part I of this survey.

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 as much as 15 percent, 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 classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-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, SP-SM.

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 grain-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 oven-dry 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.

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

Engineering Index Test Data

The table "Engineering Index Test Data" shows laboratory test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Detailed Soil Map Units" in Part I of this survey. The soil samples were tested by the Wisconsin Department of Transportation, Division of Highways and Transportation Facilities.

The testing methods generally are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM).

The tests and methods are AASHTO classification—M 145 (AASHTO), D 3282 (ASTM); Unified classification—D 2487 (ASTM); Mechanical analysis—T 88 (AASHTO), D 422 (ASTM), D 2217 (ASTM); Liquid limit—T 89 (AASHTO), D 4318 (ASTM); and Plasticity index—T 90 (AASHTO), D 4318 (ASTM).

Physical and Chemical Properties

The tables "Physical Properties of the Soils" and "Chemical Properties of the Soils" show estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given in the series descriptions in Part I of this survey.

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

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

In the table "Physical Properties of the Soils," *moist bulk density* is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at $1/3$ -bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In the table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 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 estimates indicate the rate of downward movement of water 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 major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Shrink-swell potential is the potential for volume

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

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

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; *high*, 6 to 9 percent; and *very high*, more than 9 percent.

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 or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, very fine sand, sand, and organic matter (as much as 4 percent) and on soil structure and permeability. The estimates are modified by the presence of rock fragments. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion.

Erosion factor K_f 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 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 resistance to wind erosion in cultivated areas. The groups indicate the susceptibility of soil to wind erosion. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils generally are not suitable for crops. They are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams that have more than 5 percent finely divided calcium carbonate. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if measures to control wind erosion are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils have less than 5 percent finely divided calcium carbonate. They are moderately erodible. Crops can be grown if ordinary measures to control wind erosion are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils have less than 5 percent finely divided calcium carbonate. They are very slightly erodible. Crops can be grown if ordinary measures to control wind erosion are used.

8. Soils that are not subject to wind erosion because of rock fragments on the surface or because of surface wetness.

The *wind erodibility index* is a number that is determined based on the percentage of dry, nonerodible surface soil aggregates larger than 0.84 millimeter in diameter. It is an expression of the stability of the soil aggregates, or the extent to which they are broken down by tillage and the abrasion caused by windblown soil particles.

In the table "Chemical Properties of the Soils," *cation-exchange capacity* is the total amount of

exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. 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. Soils having a high cation-exchange capacity can retain cations. The ability to retain cations helps to prevent the pollution of ground water.

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

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.

Water Features

The table "Water Features" gives estimates of several important water features used in land use planning that involves engineering considerations. These features are described in the following paragraphs.

Hydrologic soil groups are groups of soils that, when saturated, have the same runoff potential under similar storm and ground cover conditions. The soil properties that affect the runoff potential are those that influence the minimum rate of infiltration in a bare soil after prolonged wetting and when the soil is not frozen. These properties include the depth to a seasonal high water table, the infiltration rate, permeability after prolonged wetting, and the depth to a very slowly permeable layer. The influences of ground cover and slope are treated independently and are not taken into account in hydrologic soil groups.

In the definitions of the hydrologic soil groups, the infiltration rate is the rate at which water enters the soil at the surface and is controlled by surface conditions. The transmission rate is the rate at which water moves through the soil and is controlled by properties of the soil layers.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist

chiefly of very 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 a moderately fine 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 that have a moderately fine 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 clayey soils that have a high shrink-swell potential, soils that have a permanent 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 two hydrologic groups in the table, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflow from streams or by runoff from adjacent slopes. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in marshes and swamps or in closed depressions is considered to be ponding.

The table gives the frequency and duration of flooding and the time of year when flooding is most likely to occur. Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as none, rare, occasional, or frequent. *None* means that flooding is not probable; *rare* that it is unlikely but is possible under unusual weather conditions (the chance of flooding is nearly 0 percent 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); and *frequent* (fig. 23) that it occurs often under normal weather conditions (the chance of flooding is 50 percent or more in any year).

Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 to 30 days), and *very long* (more than 30 days). The time of year that flooding is most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely thin strata of gravel, sand, silt,



Figure 23.—Alganssee and Kalmarville soils are frequently flooded for long periods. The flooding is most likely to occur from March through June.

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

High water table (seasonal) is a zone of saturation at the highest average depth during the wettest season. It is at least 6 inches thick, persists in the soil for more than a few weeks, and is within 6 feet of the surface. Indicated in the table are the depth to the seasonal high water table, the kind of water table, and the months of the year when the water table usually is highest.

An *apparent* water table is indicated by the level at

which water stands in a freshly dug, unlined borehole after adequate time for adjustments in the surrounding soil.

A *perched* water table is one that is above an unsaturated zone in the soil. The basis for determining that a water table is perched may be general knowledge of the area. The water table is proven to be perched if the water level in a borehole is observed to fall when the borehole is extended.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Soil Features

The table "Soil Features" gives estimates of several important soil features used in land use planning that involves engineering considerations. These features are described in the following paragraphs:

Depth to bedrock is given if bedrock is within a depth of 60 inches. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard or massive, blasting or special equipment generally is needed for excavation.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence generally results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. The table shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which results from a combination of factors.

Potential 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 mainly to pavements and other rigid structures.

A *low* potential for frost action indicates that the soil is rarely susceptible to the formation of ice lenses; a *moderate* potential indicates that the soil is susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength; and a *high* potential indicates that the soil is highly susceptible to formation of ice lenses, resulting in frost heave and the subsequent loss of soil strength.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate 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 in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

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

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

Engineering Index Properties

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
11A: Markey-----	0-27	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
	27-60	Sand, loamy sand, fine sand.	SP, SM, SP-SM	A-2, A-3	0	0	100	85-100	50-75	0-20	0-14	NP
20A: Palms-----	0-40	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
	40-60	Silt loam, silty clay loam, sandy loam.	CL-ML, CL, SC, SC-SM	A-4, A-6	0	0	85-100	80-100	70-95	40-90	25-40	5-20
Houghton-----	0-16	Muck, mucky peat.	PT	A-8	0	0	0	0	0	0	---	NP
	16-60	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
21A: Palms-----	0-40	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
	40-60	Silt loam, silty clay loam, sandy loam.	CL-ML, CL, SC, SC-SM	A-4, A-6	0	0	85-100	80-100	70-95	40-90	25-40	5-20
40A: Markey-----	0-27	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
	27-60	Sand, gravelly loamy sand, coarse sand.	SP, SM, SP-SM	A-2, A-3, A-1	0	0	95-100	50-100	15-75	0-30	0-15	NP
Seelyeville----	0-12	Muck-----	PT	A-8	0	0	0	0	0	0	---	NP
	12-72	Muck, mucky peat.	PT	A-8	0	0	0	0	0	0	---	NP
114B2: Mt. Carroll-----	0-12	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-30	5-15
	12-46	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-40	5-20
	46-80	Silt loam, silt	CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	5-15
114C2: Mt. Carroll-----	0-12	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-30	5-15
	12-46	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	25-40	5-20
	46-80	Silt loam, silt	CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	5-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
115B2: Seaton-----	0-13	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-30	5-15
	13-55	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	100	95-100	25-40	5-20
	55-80	Silt loam, silt	CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	5-15
115C2: Seaton-----	0-13	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-30	5-15
	13-55	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	100	95-100	25-40	5-20
	55-80	Silt loam, silt	CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	5-15
115D2: Seaton-----	0-13	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	95-100	20-30	5-15
	13-55	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	100	95-100	25-40	5-20
	55-80	Silt loam, silt	CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-35	5-15
116C2: Churchtown-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	80-100	65-90	20-35	5-15
	9-26	Silt loam, loam	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	65-95	55-90	25-40	10-20
	26-60	Silt loam-----	CL-ML	A-4	0	0	100	100	100	70-90	20-35	5-15
116D2: Churchtown-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	80-100	65-90	20-35	5-15
	9-26	Silt loam, loam	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	65-95	55-90	25-40	10-20
	26-60	Silt loam-----	CL-ML	A-4	0	0	100	100	100	70-90	20-35	5-15
116E: Churchtown-----	0-5	Silt loam-----	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	80-100	65-90	20-35	5-15
	5-26	Silt loam, loam	CL, CL-ML	A-4, A-6	0-5	0-10	90-100	90-100	65-95	55-90	25-40	10-20
	26-60	Silt loam-----	CL-ML	A-4	0	0	100	100	100	70-90	20-35	5-15
125B2: Pepin-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	4-10
	9-48	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-40	9-20
	48-58	Clay, flaggy clay loam, channery silty clay.	CL, CH, GC, SC	A-7, A-2-7	0-10	1-20	50-100	45-95	35-95	30-90	40-85	20-50
	58-66	Very flaggy loam, clay loam, channery sandy loam.	GC, SC, CL, CL-ML	A-4, A-6, A-2, A-1-b	1-20	2-30	50-100	45-95	25-95	15-75	23-40	6-18
	66	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
125C2: Pepin-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	4-10
	9-48	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-40	9-20
	48-58	Clay, flaggy clay loam, channery silty clay.	CL, CH, GC, SC	A-7, A-2-7	0-10	1-20	50-100	45-95	35-95	30-90	40-85	20-50
	58-66	Very flaggy loam, clay loam, channery sandy loam.	GC, SC, CL, CL-ML	A-4, A-6, A-2, A-1-b	1-20	2-30	50-100	45-95	25-95	15-75	23-40	6-18
	66	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
125D2: Pepin-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	4-10
	9-48	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-40	9-20
	48-58	Clay, flaggy clay loam, channery silty clay.	CL, CH, GC, SC	A-7, A-2-7	0-10	1-20	50-100	45-95	35-95	30-90	40-85	20-50
	58-66	Very flaggy loam, clay loam, channery sandy loam.	GC, SC, CL, CL-ML	A-4, A-6, A-2, A-1-b	1-20	2-30	50-100	45-95	25-95	15-75	23-40	6-18
	66	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
125E2: Pepin-----	0-9	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	100	90-100	20-30	4-10
	9-48	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	100	90-100	25-40	9-20
	48-58	Clay, flaggy clay loam, channery silty clay.	CL, CH, GC, SC	A-7, A-2-7	0-10	1-20	50-100	45-95	35-95	30-90	40-85	20-50
	58-66	Very flaggy loam, clay loam, channery sandy loam.	GC, SC, CL, CL-ML	A-4, A-6, A-2, A-1-b	1-20	2-30	50-100	45-95	25-95	15-75	23-40	6-18
	66	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
					Pct	Pct					Pct	
144B2:	In											
NewGlarus-----	0-8	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	80-90	25-45	10-25
	8-23	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	90-100	85-95	30-50	10-30
	23-35	Clay, silty clay.	CH, CL, GC, SC	A-7, A-2-7	0-10	1-20	50-95	45-95	35-95	30-90	40-85	20-50
	35	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
144C2:												
NewGlarus-----	0-8	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	80-90	25-45	10-25
	8-23	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	90-100	85-95	30-50	10-30
	23-35	Clay, silty clay.	CH, CL, GC, SC	A-7, A-2-7	0-10	1-20	50-95	45-95	35-95	30-90	40-85	20-50
	35	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
144D2:												
NewGlarus-----	0-8	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	80-90	25-45	10-25
	8-23	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	90-100	85-95	30-50	10-30
	23-35	Clay, silty clay.	CH, CL, GC, SC	A-7, A-2-7	0-10	1-20	50-95	45-95	35-95	30-90	40-85	20-50
	35	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
144E:												
NewGlarus-----	0-3	Silt loam-----	CL, CL-ML	A-6, A-4	0	0	100	100	90-100	80-90	25-45	10-25
	3-23	Silty clay loam, silt loam.	CL, CL-ML	A-6, A-7, A-4	0	0	95-100	95-100	90-100	85-95	30-50	10-30
	23-35	Clay, silty clay.	CH, CL, GC, SC	A-7, A-2-7	0-10	1-20	50-95	45-95	35-95	30-90	40-85	20-50
	35	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
213C2: Hixton-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-25	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	75-95	60-90	25-35	10-20
	25-32	Sandy loam, loam, channery fine sandy loam.	SC-SM, SC	A-4, A-2-4, A-1-b	0	0-9	55-100	50-100	30-80	15-50	21-28	4-9
	32-37	Channery sand, sand, channery fine sand.	SP	A-3, A-1-b	0	0-9	55-100	50-100	15-85	4-35	0-14	NP
	37-55	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
213D2: Hixton-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-25	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	75-95	60-90	25-35	10-20
	25-32	Sandy loam, loam, channery fine sandy loam.	SC-SM, SC	A-4, A-2-4, A-1-b	0	0-9	55-100	50-100	30-80	15-50	21-28	4-9
	32-37	Channery sand, sand, channery fine sand.	SP	A-3, A-1-b	0	0-9	55-100	50-100	15-85	4-35	0-14	NP
	37-55	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
213E2: Hixton-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-25	Silt loam, loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	75-95	60-90	25-35	10-20
	25-32	Sandy loam, loam, channery fine sandy loam.	SC-SM, SC	A-4, A-2-4, A-1-b	0	0-9	55-100	50-100	30-80	15-50	21-28	4-9
	32-37	Channery sand, sand, channery fine sand.	SP	A-3, A-1-b	0	0-9	55-100	50-100	15-85	4-35	0-14	NP
	37-55	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
224B: Elevasil-----	0-3	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-45	18-25	3-7
	3-27	Sandy loam, loam, channery sandy loam.	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-1-b	0	0-9	80-100	50-100	30-80	15-55	21-28	4-9
	27-31	Loamy sand, loamy fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	15-70	4-35	0-21	NP-4
	31-39	Sand, fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	10-60	2-20	0-18	NP-3
	39-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
224C2: Elevasil-----	0-3	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-45	18-25	3-7
	3-27	Sandy loam, loam, channery sandy loam.	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-1-b	0	0-9	80-100	50-100	30-80	15-55	21-28	4-9
	27-31	Loamy sand, loamy fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	15-70	4-35	0-21	NP-4
	31-39	Sand, fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	10-60	2-20	0-18	NP-3
	39-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
224D2: Elevasil-----	0-3	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-45	18-25	3-7
	3-27	Sandy loam, loam, channery sandy loam.	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-1-b	0	0-9	80-100	50-100	30-80	15-55	21-28	4-9
	27-31	Loamy sand, loamy fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	15-70	4-35	0-21	NP-4
	31-39	Sand, fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	10-60	2-20	0-18	NP-3
	39-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
233C: Boone-----	0-8	Sand-----	SM, SP-SM	A-2, A-3, A-1	0	0-9	80-100	75-100	40-80	5-35	0-14	NP
	8-35	Fine sand, sand, channery sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0-9	55-100	50-100	20-75	1-35	0-14	NP
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
254B2: Norden-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-20	Silt loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	75-95	60-90	25-40	10-20
	20-37	Loam, fine sandy loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4	0	0-3	55-100	50-100	35-95	25-80	0-30	NP-10
	37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
254C2: Norden-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-20	Silt loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	75-95	60-90	25-40	10-20
	20-37	Loam, fine sandy loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4	0	0-3	55-100	50-100	35-95	25-80	0-30	NP-10
	37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
254D2: Norden-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-20	Silt loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	75-95	60-90	25-40	10-20
	20-37	Loam, fine sandy loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4	0	0-3	55-100	50-100	35-95	25-80	0-30	NP-10
	37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
254E2: Norden-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	8-20	Silt loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	75-95	60-90	25-40	10-20
	20-37	Loam, fine sandy loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4	0	0-3	55-100	50-100	35-95	25-80	0-30	NP-10
	37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
254F: Norden-----	0-3	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	90-100	20-30	5-10
	3-20	Silt loam, loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	75-95	60-90	25-40	10-20
	20-37	Loam, fine sandy loam, channery sandy loam.	SM, SC, ML, CL	A-2, A-4	0	0-3	55-100	50-100	35-95	25-80	0-30	NP-10
	37	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
255B2: Urne-----	0-9	Fine sandy loam	SC-SM, SC	A-4	0	0	85-100	75-100	55-90	30-50	20-30	5-10
	9-36	Fine sandy loam, very fine sandy loam, channery loam.	SM, ML, CL, SC	A-2, A-4	0	0	55-100	50-100	35-95	25-80	20-30	5-10
	36-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
255C2: Urne-----	0-9	Fine sandy loam	SC-SM, SC	A-4	0	0	85-100	75-100	55-90	30-50	20-30	5-10
	9-36	Fine sandy loam, very fine sandy loam, channery loam.	SM, ML, CL, SC	A-2, A-4	0	0	55-100	50-100	35-95	25-80	20-30	5-10
	36-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
255D2: Urne-----	0-9	Fine sandy loam	SC-SM, SC	A-4	0	0	85-100	75-100	55-90	30-50	20-30	5-10
	9-36	Fine sandy loam, very fine sandy loam, channery loam.	SM, ML, CL, SC	A-2, A-4	0	0	55-100	50-100	35-95	25-80	20-30	5-10
	36-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
255E: Urne-----	0-2	Fine sandy loam	SC-SM, SC	A-4	0	0	85-100	75-100	55-90	30-50	20-30	5-10
	2-36	Fine sandy loam, very fine sandy loam, channery loam.	SM, ML, CL, SC	A-2, A-4	0	0	55-100	50-100	35-95	25-80	20-30	5-10
	36-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
255F: Urne-----	0-2	Fine sandy loam	SC-SM, SC	A-4	0	0	85-100	75-100	55-90	30-50	20-30	5-10
	2-36	Fine sandy loam, very fine sandy loam, channery loam.	SM, ML, CL, SC	A-2, A-4	0	0	55-100	50-100	35-95	25-80	20-30	5-10
	36-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
265B: Garne-----	0-10	Loamy sand	SM	A-2-4, A-1-b	0	0	90-100	75-100	40-90	15-35	0-18	NP-3
	10-23	Loamy sand, sand, fine sand.	SM	A-2-4, A-1-b	0	0	90-100	75-100	40-90	15-35	0-18	NP-3
	23-27	Sand, loamy fine sand, loamy sand.	SM, SP-SM	A-4, A-2-4, A-1-b, A-3	0	0	90-100	75-100	30-70	5-35	0-18	NP-3
	27-34	Very fine sandy loam, channery loam, fine sandy loam.	SM, SC, ML, CL	A-4, A-2-4, A-1-b	0	0-10	55-100	50-100	35-95	20-80	18-28	3-9
	34-48	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
265C: Garne-----	0-10	Loamy sand-----	SM	A-2-4, A-1-b	0	0	90-100	75-100	40-90	15-35	0-18	NP-3
	10-23	Loamy sand, sand, fine sand.	SM	A-2-4, A-1-b	0	0	90-100	75-100	40-90	15-35	0-18	NP-3
	23-27	Sand, loamy fine sand, loamy sand.	SM, SP-SM	A-4, A-2-4, A-1-b, A-3	0	0	90-100	75-100	30-70	5-35	0-18	NP-3
	27-34	Very fine sandy loam, channery loam, fine sandy loam.	SM, SC, ML, CL	A-4, A-2-4, A-1-b	0	0-10	55-100	50-100	35-95	20-80	18-28	3-9
	34-48	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
	48	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP
303A: Boguscreek-----	0-9	Silt loam-----	CL-ML, ML	A-4	0	0	90-100	90-100	60-95	50-90	15-25	NP-9
	9-50	Silt loam-----	CL-ML, ML	A-4	0	0	85-100	75-100	60-95	50-90	15-25	NP-9
	50-57	Silt loam, loam, sandy loam.	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	85-100	75-100	50-100	30-90	15-25	NP-9
	57-80	Sand, coarse sand, gravelly coarse sand.	SP	A-1, A-2	0	0-5	75-100	50-100	15-35	2-10	0-10	NP
313D2: Plumcreek-----	0-4	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	80-100	70-90	20-35	5-15
	4-7	Silt loam, loam	CL, CL-ML	A-4	0	0	100	100	75-100	60-90	20-30	5-10
	7-28	Silt loam, loam, sandy loam.	CL, SC	A-6, A-2-6	0	0	100	100	60-100	30-85	30-35	10-15
	28-36	Stratified silt loam to sandy loam.	CL, ML, SC, SM	A-4, A-6	0	0	100	100	65-100	35-75	20-35	5-15
	36-60	Stratified sand to silty clay loam.	CL, ML, SC, SM	A-4, A-6	0	0	100	100	65-100	35-75	20-35	5-15

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
313F: Plumcreek-----	0-4	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	80-100	70-90	20-35	5-15
	4-7	Silt loam, loam	CL, CL-ML	A-4	0	0	100	100	75-100	60-90	20-30	5-10
	7-28	Silt loam, loam, sandy loam.	CL, SC	A-6, A-2-6	0	0	100	100	60-100	30-85	30-35	10-15
	28-36	Stratified silt loam to sandy loam.	CL, ML, SC, SM	A-4, A-6	0	0	100	100	65-100	35-75	20-35	5-15
	36-60	Stratified sand to silty clay loam.	CL, ML, SC, SM	A-4, A-6	0	0	100	100	65-100	35-75	20-35	5-15
316B2: Ella-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-100	20-35	4-15
	8-55	Silt loam, silty clay loam.	CL, CL-ML	A-6	0	0	100	100	90-100	80-100	28-35	9-15
	55-72	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	65-90	35-80	20-28	4-9
	72-80	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	65-90	35-80	20-28	4-9
316C2: Ella-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-100	20-35	4-15
	8-55	Silt loam, silty clay loam.	CL, CL-ML	A-6	0	0	100	100	90-100	80-100	28-35	9-15
	55-72	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	65-90	35-80	20-28	4-9
	72-80	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4	0	0	100	100	65-90	35-80	20-28	4-9

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
318A: Bearpen-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-95	20-35	4-15
	8-18	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-95	23-32	6-13
	18-41	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-95	28-36	9-16
	41-50	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-6, A-2-4, A-2-6	0	0	100	100	55-95	30-80	23-32	6-13
	50-60	Stratified silty clay loam to sandy loam.	CL, CL-ML, SC, SC-SM	A-4, A-2-4	0	0	100	100	55-95	30-80	20-28	4-9
326B2: Medary-----	0-7	Silt loam-----	CL, CL-ML	A-4	0	0	100	100	90-100	60-95	20-30	5-10
	7-14	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	60-95	20-40	5-20
	14-30	Stratified clay to silty clay loam.	CL, CH	A-7	0	0	100	100	90-100	75-95	40-65	25-40
	30-60	Stratified clay to silt loam.	CH, CL	A-7, A-6	0	0	100	100	90-100	75-95	35-60	15-35
403A: Dakota-----	0-10	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	80-100	65-90	20-35	5-15
	10-13	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	95-100	85-100	80-100	65-90	20-35	5-15
	13-35	Silt loam, loam, sandy loam.	CL, SC	A-4, A-6	0	0	95-100	85-100	50-90	35-80	25-40	10-20
	35-38	Loamy sand, loamy coarse sand, gravelly coarse sand.	SM, SP, SP-SM	A-2-4, A-1, A-3	0	0-9	55-100	50-100	20-75	2-15	0-15	NP-5
	38-60	Sand, gravelly coarse sand, coarse sand.	SP, SM, SP-SM	A-1, A-3, A-2	0	0-9	55-100	50-100	20-75	2-15	0-10	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
413A: Rasset-----	0-18	Sandy loam-----	SM, SC-SM, SC	A-2, A-4	0	0-5	90-100	75-100	50-70	30-50	20-30	2-10
	18-30	Sandy loam, loam.	SM, SC-SM, SC	A-4, A-6	0	0-5	90-100	75-100	50-80	35-50	20-35	3-15
	30-42	Loamy sand, loamy coarse sand, sand.	SP, SP-SM, SM	A-1, A-2, A-3	0-1	0-5	75-100	50-100	40-80	2-15	0-15	NP-4
	42-60	Sand, coarse sand, gravelly sand.	SP, SP-SM	A-1, A-2, A-3	0-1	0-5	75-100	50-100	25-75	2-8	0-10	NP
413B: Rasset-----	0-18	Sandy loam-----	SM, SC-SM, SC	A-2, A-4	0	0-5	90-100	75-100	50-70	30-50	20-30	2-10
	18-30	Sandy loam, loam.	SM, SC-SM, SC	A-4, A-6	0	0-5	90-100	75-100	50-80	35-50	20-35	3-15
	30-42	Loamy sand, loamy coarse sand, sand.	SP, SP-SM, SM	A-1, A-2, A-3	0-1	0-5	75-100	50-100	40-80	2-15	0-15	NP-4
	42-60	Sand, coarse sand, gravelly sand.	SP, SP-SM	A-1, A-2, A-3	0-1	0-5	75-100	50-100	25-75	2-8	0-10	NP
423A: Meridian-----	0-9	Silt loam-----	ML, CL, CL-ML	A-4	0	0	100	100	80-100	70-90	20-30	5-10
	9-28	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	100	90-100	70-100	65-90	25-35	10-15
	28-32	Sandy loam, loam.	CL, SC, SC-SM, CL-ML	A-4, A-6	0	0	100	90-100	55-95	30-70	25-35	5-15
	32-72	Loamy coarse sand, sand, coarse sand.	SM, SP, SP-SM, GM	A-1-b, A-3, A-2-4	0	0-9	75-100	50-100	15-75	2-35	0-10	NP
423B2: Meridian-----	0-9	Silt loam-----	ML, CL, CL-ML	A-4	0	0	100	100	80-100	70-90	20-30	5-10
	9-28	Silt loam, loam, silty clay loam.	CL-ML, CL	A-4, A-6	0	0	100	90-100	70-100	65-90	25-35	10-15
	28-32	Sandy loam, loam.	CL, SC, SC-SM, CL-ML	A-4, A-6	0	0	100	90-100	55-95	30-70	25-35	5-15
	32-72	Loamy coarse sand, sand, coarse sand.	SM, SP, SP-SM, GM	A-1-b, A-3, A-2-4	0	0-9	75-100	50-100	15-75	2-35	0-10	NP

Engineering Index Properties--Continued

Map symbol and soil name	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		
429A: Lows-----	In											
	0-6	Loam-----	ML, CL, CL-ML	A-4	0	0	100	95-100	85-95	60-75	25-30	5-15
	6-13	Loam, sandy loam, silt loam.	ML, CL, SM, SC-SM	A-4, A-2	0	0	100	95-100	60-95	30-85	20-30	5-15
	13-28	Loam, silt loam, sandy clay loam.	CL, SC	A-6	0	0	100	95-100	80-95	35-75	30-35	10-15
	28-60	Sand, loamy sand, fine sand.	SM, SP, SP-SM	A-2, A-3	0	0	100	75-100	20-70	3-30	0-15	NP-5
432A: Kevilar-----	0-9	Sandy loam----	SM, SC-SM	A-4, A-2-4	0	0	80-100	75-100	45-80	20-50	0-25	NP-7
	9-29	Loam, sandy loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	29-50	Sand, fine sand, loamy sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	80-100	75-100	20-85	5-35	0-20	NP-4
	50-80	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
432B: Kevilar-----	0-9	Sandy loam----	SM, SC-SM	A-4, A-2-4	0	0	80-100	75-100	45-80	20-50	0-25	NP-7
	9-29	Loam, sandy loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	29-50	Sand, fine sand, loamy sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	80-100	75-100	20-85	5-35	0-20	NP-4
	50-80	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
432C2: Kevilar-----	0-9	Sandy loam----	SM, SC-SM	A-4, A-2-4	0	0	80-100	75-100	45-80	20-50	0-25	NP-7
	9-29	Loam, sandy loam, fine sandy loam.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	29-50	Sand, fine sand, loamy sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	80-100	75-100	20-85	5-35	0-20	NP-4
	50-80	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
433A: Forkhorn-----	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-50	0-25	NP-7
	9-25	Sandy loam, fine sandy loam, loam.	CL, ML, SC, SM	A-4, A-2-4	0	0-9	80-100	75-100	45-95	20-80	0-28	NP-9
	25-32	Gravelly loamy sand, coarse sand, sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	6-35	0-15	NP-4
	32-46	Stratified sand to very gravelly coarse sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	5-30	0-10	NP
	46-72	Stratified sand to very gravelly coarse sand.	SM, SP	A-3, A-1-b	0	0-9	55-100	50-98	15-70	3-25	0-10	NP
433B: Forkhorn-----	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-50	0-25	NP-7
	9-25	Sandy loam, fine sandy loam, loam.	CL, ML, SC, SM	A-4, A-2-4	0	0-9	80-100	75-100	45-95	20-80	0-28	NP-9
	25-32	Gravelly loamy sand, coarse sand, sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	6-35	0-15	NP-4
	32-46	Stratified sand to very gravelly coarse sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	5-30	0-10	NP
	46-72	Stratified sand to very gravelly coarse sand.	SM, SP	A-3, A-1-b	0	0-9	55-100	50-98	15-70	3-25	0-10	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
433C2: Forkhorn-----	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-50	0-25	NP-7
	9-25	Sandy loam, fine sandy loam, loam.	CL, ML, SC, SM	A-4, A-2-4	0	0-9	80-100	75-100	45-95	20-80	0-28	NP-9
	25-32	Gravelly loamy sand, coarse sand, sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	6-35	0-15	NP-4
	32-46	Stratified sand to very gravelly coarse sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-98	15-75	5-30	0-10	NP
	46-72	Stratified sand to very gravelly coarse sand.	SM, SP	A-3, A-1-b	0	0-9	55-100	50-98	15-70	3-25	0-10	NP
436A: Rusktown-----	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-50	15-25	NP-5
	9-25	Loam, fine sandy loam, sandy loam.	CL, ML, SC, SM	A-4, A-2-4	0	0-9	80-100	75-100	45-95	20-80	15-30	NP-10
	25-38	Loamy sand, coarse sand, gravelly sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-100	15-75	6-35	0-20	NP-5
	38-45	Coarse sand, loamy sand, gravelly sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	55-100	50-100	15-75	5-35	0-20	NP-5
	45-72	Coarse sand, sand, gravelly sand.	SM, SP	A-3, A-1-b, A-2-4	0	0-9	55-100	50-100	15-70	3-25	0-15	NP
438A: Hoopeston-----	0-13	Sandy loam-----	SM, SC-SM, SC	A-2, A-4	0	0	90-100	85-100	70-90	25-45	0-25	NP-10
	13-22	Sandy loam, fine sandy loam, loam.	SM, SC, SC-SM	A-2, A-4	0	0	90-100	85-100	60-85	25-50	0-30	NP-10
	22-72	Loamy sand, sand, fine sand.	SP-SM, SM, SC, SC-SM	A-2, A-3	0	0	90-100	85-100	50-80	5-20	0-15	NP-5

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
453A: Burkhardt-----	0-10	Sandy loam-----	SM, SC-SM	A-2, A-4	0	0-8	85-100	75-100	55-70	25-40	0-26	2-7
	10-17	Sandy loam, loam.	SM, ML, SC, CL	A-2, A-4	0	0-8	85-100	75-100	50-95	25-75	15-30	2-10
	17-60	Loamy sand, gravelly coarse sand, sand.	SP, SP-SM, GP, GP-GM	A-1	0	0-8	50-85	45-85	20-35	1-5	0-10	NP
453B: Burkhardt-----	0-10	Sandy loam-----	SM, SC-SM	A-2, A-4	0	0-8	85-100	75-100	55-70	25-40	0-26	2-7
	10-17	Sandy loam, loam.	SM, ML, SC, CL	A-2, A-4	0	0-8	85-100	75-100	50-95	25-75	15-30	2-10
	17-60	Loamy sand, gravelly coarse sand, sand.	SP, SP-SM, GP, GP-GM	A-1	0	0-8	50-85	45-85	20-35	1-5	0-10	NP
501A: Finchford-----	0-10	Loamy sand-----	SP-SM, SM	A-2-4, A-3	0	0-8	85-100	75-100	35-75	10-25	0-14	NP
	10-19	Loamy sand, sand, coarse sand.	SP-SM, SM	A-2-4, A-3	0	0-8	85-100	75-100	30-75	10-25	0-14	NP
	19-26	Sand, loamy sand, gravelly sand.	SW-SM, SP-SM	A-1-b	0	0-8	80-100	50-95	25-70	5-20	0-14	NP
	26-80	Gravelly coarse sand, sand, gravelly sand.	SW, SW-SM, SP, SP-SM	A-1-b	0	0-8	75-100	50-95	20-60	0-10	0-10	NP
501B: Finchford-----	0-10	Loamy sand-----	SP-SM, SM	A-2-4, A-3	0	0-8	85-100	75-100	35-75	10-25	0-14	NP
	10-19	Loamy sand, sand, coarse sand.	SP-SM, SM	A-2-4, A-3	0	0-8	85-100	75-100	30-75	10-25	0-14	NP
	19-26	Sand, loamy sand, gravelly sand.	SW-SM, SP-SM	A-1-b	0	0-8	80-100	50-95	25-70	5-20	0-14	NP
	26-80	Gravelly coarse sand, sand, gravelly sand.	SW, SW-SM, SP, SP-SM	A-1-b	0	0-8	75-100	50-95	20-60	0-10	0-10	NP
502B2: Chelsea-----	0-9	Fine sand-----	SP, SP-SM, SM	A-3, A-2-4	0	0	100	100	65-95	3-15	0-14	NP
	9-60	Fine sand, sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	100	65-80	3-15	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
502C2: Chelsea-----	0-9	Fine sand-----	SP, SP-SM, SM	A-3, A-2-4	0	0	100	100	65-95	3-15	0-14	NP
	9-60	Fine sand, sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	100	65-80	3-15	0-14	NP
506A: Komro-----	0-10	Loamy sand-----	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	75-100	30-75	10-35	0-20	NP-4
	10-18	Loamy sand, sand, coarse sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	75-100	20-75	5-35	0-18	NP-3
	18-38	Sand, gravelly coarse sand, loamy sand.	SM, SP, SP-SM	A-2-4, A-3, A-1-b	0	0-9	70-100	65-100	20-75	3-35	0-18	NP-3
	38-72	Sand, gravelly coarse sand.	SM, SP, SP-SM	A-3, A-1-b	0	0-9	70-100	65-100	20-70	3-25	0-10	NP
508A: Farrington-----	0-9	Loamy sand-----	SM, SP-SM	A-2-4, A-1-b	0	0	80-100	75-100	40-75	10-35	0-20	NP-4
	9-18	Loamy sand, sand, coarse sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	80-100	75-100	20-75	5-35	0-18	NP-3
	18-41	Loamy sand, coarse sand, sand.	SM, SP-SM	A-2-4, A-3, A-1-b	0	0	80-100	75-100	20-75	5-35	0-18	NP-3
	41-72	Coarse sand, sand.	SM, SP-SM	A-3, A-1-b	0	0	80-100	75-100	20-70	5-25	0-10	NP
510B: Boplain-----	0-9	Sand-----	SP-SM, SM	A-3, A-1-a	0	0	85-100	75-100	20-70	5-25	0-15	NP
	9-32	Sand, coarse sand, loamy sand.	SP-SM, SM	A-3, A-2-4, A-1-a	0	0	85-100	75-100	20-75	5-35	0-20	NP-5
	32-37	Sand, fine sand	SM, SP-SM	A-3, A-1-a	0	0-5	80-100	75-100	20-70	5-25	0-15	NP
	37-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
510C: Boplain-----	0-9	Sand-----	SP-SM, SM	A-3, A-1-a	0	0	85-100	75-100	20-70	5-25	0-15	NP
	9-32	Sand, coarse sand, loamy sand.	SP-SM, SM	A-3, A-2-4, A-1-a	0	0	85-100	75-100	20-75	5-35	0-20	NP-5
	32-37	Sand, fine sand	SM, SP-SM	A-3, A-1-a	0	0-5	80-100	75-100	20-70	5-25	0-15	NP
	37-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
510F: Boplain-----	0-9	Sand-----	SP-SM, SM	A-3, A-1-a	0	0	85-100	75-100	20-70	5-25	0-15	NP
	9-32	Sand, coarse sand, loamy sand.	SP-SM, SM	A-3, A-2-4, A-1-a	0	0	85-100	75-100	20-75	5-35	0-20	NP-5
	32-37	Sand, fine sand	SM, SP-SM	A-3, A-1-a	0	0-5	80-100	75-100	20-70	5-25	0-15	NP
	37-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
511A: Plainfield-----	0-4	Sand-----	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	20-55	5-25	0-14	NP
	4-32	Sand, loamy sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	20-55	5-25	0-14	NP
	32-80	Sand, coarse sand, gravelly coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0-9	75-100	50-100	15-70	1-15	0-10	NP
511B: Plainfield-----	0-4	Sand-----	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	20-55	5-25	0-14	NP
	4-32	Sand, loamy sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	20-55	5-25	0-14	NP
	32-80	Sand, coarse sand, gravelly coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0-9	75-100	50-100	15-70	1-15	0-10	NP
511C: Plainfield-----	0-4	Sand-----	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	20-55	5-25	0-14	NP
	4-32	Sand, loamy sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	20-55	5-25	0-14	NP
	32-80	Sand, coarse sand, gravelly coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0-9	75-100	50-100	15-70	1-15	0-10	NP
511F: Plainfield-----	0-4	Sand-----	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	20-55	5-25	0-14	NP
	4-32	Sand, loamy sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	20-55	5-25	0-14	NP
	32-80	Sand, coarse sand, gravelly coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0-9	75-100	50-100	15-70	1-15	0-10	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
512B: Drammen-----	0-9	Loamy sand-----	SM, SP-SM	A-2, A-4, A-1	0	0	75-100	75-100	40-90	12-40	0-14	NP
	9-44	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	40-80	3-35	0-14	NP
	44-65	Sand, loamy sand, fine sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-70	3-35	0-14	NP
	65-72	Sand, coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-90	1-15	0-14	NP
512C: Drammen-----	0-9	Loamy sand-----	SM, SP-SM	A-2, A-4, A-1	0	0	75-100	75-100	40-90	12-40	0-14	NP
	9-44	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	40-80	3-35	0-14	NP
	44-65	Sand, loamy sand, fine sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-70	3-35	0-14	NP
	65-72	Sand, coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-90	1-15	0-14	NP
512D: Drammen-----	0-9	Loamy sand-----	SM, SP-SM	A-2, A-4, A-1	0	0	75-100	75-100	40-90	12-40	0-14	NP
	9-44	Sand, loamy sand, fine sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	75-100	75-100	40-80	3-35	0-14	NP
	44-65	Sand, loamy sand, fine sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-70	3-35	0-14	NP
	65-72	Sand, coarse sand.	SP, SM, SP-SM	A-3, A-1, A-2	0	0	75-100	75-100	40-90	1-15	0-14	NP
516A: Aldo-----	0-7	Sand-----	SP	A-2	0	0	85-100	75-100	20-70	5-25	0-14	NP
	7-42	Sand, coarse sand, loamy sand.	SM, SP-SM	A-2	0	0-5	85-100	75-100	20-75	5-35	0-14	NP
	42-80	Sand, coarse sand, gravelly coarse sand.	SP	A-1, A-2	0	0-5	75-100	50-100	15-35	2-10	0-10	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
546A: Prissel-----	0-9	Loamy sand-----	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	5-35	0-14	NP
	9-48	Loamy sand, sand, fine sand.	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	20-85	5-35	0-14	NP
	48-56	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	56-72	Sand, fine sand	SP, SM, SP-SM	A-1-b, A-3, A-2-4	0	0	80-100	75-100	20-85	4-35	0-14	NP-4
546B: Prissel-----	0-9	Loamy sand-----	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	5-35	0-14	NP
	9-48	Loamy sand, sand, fine sand.	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	20-85	5-35	0-14	NP
	48-56	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	56-72	Sand, fine sand	SP, SM, SP-SM	A-1-b, A-3, A-2-4	0	0	80-100	75-100	20-85	4-35	0-14	NP-4
546F: Prissel-----	0-9	Loamy sand-----	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	30-75	5-35	0-14	NP
	9-48	Loamy sand, sand, fine sand.	SM, SP-SM	A-1-b, A-2-4	0	0	80-100	75-100	20-85	5-35	0-14	NP
	48-56	Stratified loam to sand.	CL, ML, SC, SM	A-4, A-2-4	0	0	80-100	75-100	45-95	20-80	0-28	NP-9
	56-72	Sand, fine sand	SP, SM, SP-SM	A-1-b, A-3, A-2-4	0	0	80-100	75-100	20-85	4-35	0-14	NP-4
561B: Tarr-----	0-6	Sand-----	SM, SP-SM	A-1, A-2, A-3	0	0	80-100	75-100	20-70	5-25	0-14	NP
	6-34	Sand, fine sand	SP, SP-SM	A-1, A-3, A-2	0	0	80-100	75-100	45-80	1-10	0-14	NP
	34-62	Sand, fine sand	SP, SP-SM	A-1, A-3, A-2	0	0	80-100	75-100	45-80	1-10	0-14	NP
566A: Tint-----	0-9	Sand-----	SM, SP	A-1, A-3, A-2-4	0	0	80-100	75-100	20-70	4-25	0-14	NP
	9-34	Sand, fine sand	SM, SP	A-1, A-3, A-2-4	0	0	80-100	75-100	20-85	4-35	0-14	NP
	34-60	Sand, fine sand	SM, SP	A-1, A-3, A-2-4	0	0	80-100	75-100	20-85	4-35	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
589A: Newson-----	0-8	Mucky loamy sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0	80-100	75-100	40-80	3-35	0-21	NP-4
	8-25	Sand, coarse sand, loamy sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0	80-100	75-100	20-75	3-30	0-14	NP
	25-64	Coarse sand, gravelly coarse sand, sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0	80-100	50-100	15-75	3-30	0-14	NP
616B: Chaseburg-----	0-4	Silt loam-----	ML, CL-ML	A-4	0	0	100	100	90-100	85-100	25-30	5-10
	4-60	Silt loam-----	ML, CL-ML, CL	A-4	0	0	85-100	85-100	85-100	85-100	20-30	5-10
626A: Arenzville-----	0-25	Silt loam-----	ML, CL-ML, CL	A-4	0	0	100	100	95-100	80-95	20-30	4-10
	25-40	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	85-95	30-45	10-20
	40-60	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	0	75-100	75-100	75-100	70-95	20-30	5-10
628A: Orion-----	0-8	Silt loam-----	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	80-100	25-35	4-12
	8-32	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	0	100	100	90-100	70-80	20-30	4-10
	32-40	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-4	0	0	100	100	85-100	85-100	20-40	4-18
	40-60	Stratified silt loam to very fine sand.	CL, CL-ML	A-4	0	0	80-100	80-100	80-100	75-95	20-30	4-10
629A: Ettrick-----	0-16	Silt loam-----	CL	A-6, A-7	0	0	100	100	90-100	70-90	30-50	10-25
	16-35	Silt loam, silty clay loam.	CL, CH	A-7	0	0	100	100	90-100	85-100	40-55	15-30
	35-60	Stratified silt loam to fine sand.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	100	100	60-100	30-100	20-45	4-25

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
646A: Dunntbot-----	0-9	Fine sandy loam	SM, SC-SM, ML, CL-ML	A-4	0	0	100	100	75-90	40-55	15-30	5-10
	9-36	Very fine sandy loam, silt loam, sandy loam.	ML, CL-ML, SM, SC-SM	A-2-4, A-4	0	0	100	100	55-90	30-75	15-30	5-10
	36-45	Sandy loam, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0	100	100	60-90	30-55	15-30	5-10
	45-72	Fine sand, sand, coarse sand.	SP	A-1, A-2	0	0-5	75-100	50-100	15-40	2-15	0-14	NP
656A: Scotah-----	0-4	Loamy fine sand	SM	A-2-4, A-4	0	0	85-100	75-100	55-95	20-50	0-25	NP-5
	4-22	Fine sand, sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b, A-3	0	0	85-100	75-100	20-95	5-50	0-20	NP-5
	22-60	Sand, fine sand, gravelly coarse sand.	SP-SM, SP, SM	A-1-b, A-3, A-2-4	0	0-9	85-100	50-100	15-85	5-35	0-20	NP-5
826B2: Hersey-----	0-8	Silt loam-----	CL, CL-ML	A-4	0	0	100	100	90-100	80-100	20-30	4-10
	8-36	Silt loam-----	CL, CL-ML	A-6	0	0	100	100	90-100	80-100	25-40	5-15
	36-58	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	80-100	70-100	25-40	5-15
	58-115	Clay loam, loam, sandy clay loam.	CL, CL-ML, SC	A-4, A-6, A-2	0	0-9	85-100	75-95	45-95	25-80	23-40	6-18
826C2: Hersey-----	0-8	Silt loam-----	CL, CL-ML	A-4	0	0	100	100	90-100	80-100	20-30	4-10
	8-36	Silt loam-----	CL, CL-ML	A-6	0	0	100	100	90-100	80-100	25-40	5-15
	36-58	Silt loam, loam	CL, CL-ML	A-4, A-6	0	0	100	100	80-100	70-100	25-40	5-15
	58-115	Clay loam, loam, sandy clay loam.	CL, CL-ML, SC	A-4, A-6, A-2	0	0-9	85-100	75-95	45-95	25-80	23-40	6-18

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1135F: Dorerton-----	0-3	Loam-----	ML	A-4	0	0	95-100	85-100	70-95	55-90	20-30	NP-5
	3-10	Loam, sandy loam, fine sandy loam.	ML, SM	A-4	0	0	95-100	85-100	55-90	35-80	20-30	NP-5
	10-18	Loam, clay loam, silt loam.	CL, ML	A-4, A-6	0	0-5	95-100	85-100	70-95	50-85	30-40	5-15
	18-30	Very channery clay loam, very channery loam.	GC, SC, SC-SM	A-2, A-1	0	20-55	40-75	30-65	20-45	12-35	30-45	5-20
	30-60	Extremely flaggy loamy sand, very flaggy loamy sand.	GW-GM, SM, GM	A-1, A-2	0	20-55	40-75	30-65	15-40	10-30	0-20	NP
Elbaville-----	0-4	Silt loam-----	ML, CL-ML, CL	A-4, A-6	0	0	100	100	90-100	50-95	20-35	4-15
	4-16	Silt loam, silt	ML, CL-ML	A-4	0	0	100	100	90-100	50-95	20-35	4-15
	16-20	Silty clay loam, silt loam, loam.	CL	A-4, A-6, A-7	0	0	100	100	95-100	80-95	30-45	8-20
	20-25	Silty clay, silty clay loam, clay.	CL, CH, MH, ML	A-7	0	0-20	90-100	80-100	75-100	70-95	40-65	20-32
	25-36	Very flaggy silty clay loam, very flaggy silt loam, very flaggy loam.	GC, GM, SC, SM	A-2, A-4, A-6, A-7	0-10	20-70	35-75	30-70	25-65	20-50	30-45	5-20
	36-60	Very flaggy sandy loam, very flaggy loamy sand, very flaggy sand.	GM, SM, GP-GM, SP-SM	A-2, A-1	0-10	20-70	35-75	30-70	15-50	10-30	0-20	NP-4

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1145F: Gaphill-----	0-5	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-50	18-25	3-7
	5-11	Sandy loam, fine sandy loam, loam.	SM, SC-SM, ML, CL-ML	A-4, A-2-4	0-1	0-9	80-100	75-100	45-95	20-80	0-23	NP-6
	11-32	Sandy loam, fine sandy loam, loam.	SM, SC, ML, CL	A-4, A-2-4	0-3	0-9	80-100	75-100	45-95	20-80	18-28	3-9
	32-50	Sand, loamy sand, channery loamy sand.	SM, SP	A-2-4, A-3, A-1-b	0-5	0-9	55-100	50-100	15-75	4-35	0-18	NP-3
	50-56	Sand, channery sand, flaggy sand.	SM, SP	A-3, A-1-b	0-5	0-9	55-100	50-100	15-70	2-25	0-14	NP
	56-66	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
Rockbluff-----	0-4	Loamy sand-----	SM	A-1-b	0	0-9	80-100	75-100	30-75	10-35	0-14	NP
	4-9	Loamy sand, sand, fine sand.	SM, SP-SM	A-3, A-1-a	0	0-9	80-100	75-100	20-75	5-35	0-14	NP
	9-35	Sand, channery loamy sand, fine sand.	SM, SP	A-3, A-1-a	0-3	0-9	55-100	50-100	15-75	2-35	0-14	NP
	35-52	Sand, channery sand, flaggy sand.	SM, SP	A-3, A-1-a	0-5	0-9	55-100	50-100	15-70	2-25	0-14	NP
	52-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
1155F: Brodale-----	0-6	Very flaggy loam.	SM, SP-SM, SC, GM	A-2, A-1	0	7-30	30-65	20-55	15-45	8-35	0-25	NP-8
	6-50	Very flaggy very fine sandy loam, flaggy silt loam, cobbly sandy loam.	SM, SC, SC-SM, GM	A-2, A-1	0	20-50	45-80	40-75	25-50	10-35	0-25	NP-8
	50	Unweathered bedrock.	---	---	---	---	---	---	---	---	---	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1155F:												
Bellechester----	0-16	Sand-----	SP-SM	A-3	0	0-10	90-100	85-100	70-90	5-10	0-20	NP
	16-42	Flaggy sand----	SP, SP-SM	A-3, A-2	0	0-45	85-100	70-100	50-90	3-10	0-20	NP
	42	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
Rock outcrop----	0-60	Weathered bedrock, unweathered bedrock.	---	---	---	---	---	---	---	---	---	---
1224F:												
Boone-----	0-3	Sand-----	SM, SP-SM	A-2, A-3, A-1	0	0-9	80-100	75-100	40-80	5-35	0-14	NP
	3-8	Sand, channery sand, loamy fine sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0-9	55-100	50-100	25-75	2-35	0-14	NP
	8-35	Fine sand, sand, channery sand.	SM, SP-SM, SP	A-2, A-3, A-1	0	0-9	55-100	50-100	20-75	1-35	0-14	NP
	35-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
Elevasil-----	0-3	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0-9	80-100	75-100	45-80	20-45	18-25	3-7
	3-27	Sandy loam, loam, channery sandy loam.	SC, SC-SM, CL, CL-ML	A-4, A-2-4, A-1-b	0	0-9	80-100	50-100	30-80	15-55	21-28	4-9
	27-31	Loamy sand, loamy fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	15-70	4-35	0-21	NP-4
	31-39	Sand, fine sand, channery sand.	SP, SM, SP-SM	A-2-4, A-3, A-1-b	0	0-9	80-100	50-100	10-60	2-20	0-18	NP-3
	39-60	Weathered bedrock.	---	---	---	---	---	---	---	---	---	NP
1648A:												
Northbend-----	0-7	Silt loam-----	ML, CL-ML	A-4	0	0	95-100	90-100	55-100	40-80	0-25	NP-7
	7-34	Silt loam, loam, sandy loam.	ML, CL, SM, SC	A-4	0	0	95-100	90-100	45-100	30-75	0-28	NP-9
	34-36	Loamy fine sand, loamy sand.	SM	A-1	0	0	95-100	90-100	35-95	15-50	0-14	NP
	36-60	Sand, fine sand	SP, SP-SM, SM	A-1, A-3	0	0	95-100	90-100	25-85	4-35	0-14	NP

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
1648A:												
Ettrick-----	0-16	Silt loam-----	CL	A-6, A-7	0	0	100	100	90-100	70-90	30-50	10-25
	16-35	Silt loam, silty clay loam.	CL, CH	A-7	0	0	100	100	90-100	85-100	40-55	15-30
	35-60	Stratified silt loam to fine sand.	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6, A-7	0	0	100	100	60-100	30-100	20-45	4-25
1658A:												
Alganssee-----	0-4	Fine sandy loam	SM, SC-SM	A-4	0	0	100	100	75-90	40-55	15-25	NP-5
	4-31	Loamy fine sand, fine sand, sand.	SM, SP-SM	A-3, A-2-4	0	0	85-100	75-100	25-95	5-35	0-25	NP-5
	31-60	Fine sand, sand, gravelly sand.	SM, GM	A-1-b, A-3, A-2-4	0	0	65-100	50-100	15-95	5-35	0-20	NP-5
Kalmarville-----	0-6	Silt loam-----	ML, CL, CL-ML	A-4	0	0	95-100	90-100	85-100	50-90	15-35	NP-10
	6-42	Very fine sandy loam, silt loam, fine sandy loam.	ML, SM, SC-SM, CL-ML	A-4, A-2	0	0	95-100	90-100	60-85	30-60	15-25	NP-5
	42-60	Coarse sand, sand, loamy fine sand.	SP, SM, SW, SP-SM	A-3, A-2, A-1	0	0-2	90-100	85-100	40-80	2-30	0-25	NP
2003A:												
Riverwash-----	0-60	Extremely gravelly coarse sand.	GW, GP	A-1-a	0	0-50	5-35	5-35	5-30	1-10	---	NP
2013:												
Pits, gravel----	0-60	Sand and gravel	GP, SP, GP-GM, SP-SM	A-1-a	0	0-10	0	0	0	0	---	NP
2014:												
Pits, quarry----	0-60	Weathered bedrock, unweathered bedrock.	---	---	---	---	---	---	---	---	---	---

Engineering Index Properties--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10	3-10	4	10	40	200		
					inches	inches						
	In				Pct	Pct					Pct	
2040: Udipsamments----	0-60	Stratified loamy fine sand to gravelly coarse sand.	SP, SP-SM, SM	A-1, A-2, A-3	0	0	85-100	85-100	30-80	5-50	0-14	NP
2050: Landfill.												

Engineering Index Test Data

(LL means liquid limit; PI means plasticity index)

Soil name and location	Parent material	Report number	Horizon	Depth	Percentage passing sieve*--				Percentage smaller than*--				LL	PI	Classification				
					No. 4	No. 10	No. 40	No. 200	0.05 mm	0.02 mm	0.005 mm	0.002 mm			AASHTO	Unified			
				In													Pct		
Hersey silt loam: About 1,900 ft. east and 300 ft. south of the northwest corner of sec. 1, T. 23 N., R. 15 W.	Loess over till	S93WI-091-																	
		9-3	Bt2	15-22	100	100	100	99	91	55	28	23	35.3	12.3	A-6(9)	CL			
		9-5	Bt4	36-58	100	100	100	98	92	48	23	18	33.4	9.0	A-4(8)	CL			
		9-6	2Bt5	58-88	98	97	83	54	48	35	23	18	27.9	13.7	A-6(5)	CL			
Hersey silt loam: About 1,950 ft. east and 600 ft. south of the northwest corner of sec. 1, T. 23 N., R. 15 W.	Loess over till	S93WI-091-																	
		11-3	Bt2	15-33	100	100	100	99	89	51	27	22	36.0	12.8	A-6(9)	CL			
		11-5	Bt4	47-54	100	100	100	98	93	40	19	14	29.8	5.8	A-4(8)	CL-ML			
		11-6	2Bt5	54-88	99	98	91	70	62	45	27	22	31.8	16.7	A-6(10)	CL			
Pepin silt loam: About 925 ft. north and 250 ft. west of the southeast corner of sec. 32, T. 24 N., R. 14 W.	Loess over pedisidiment underlain by dolostone residuum.	S93WI-091-																	
		17-3	Bt2	14-24	100	100	100	99	93	55	32	27	39.3	17.9	A-6(11)	CL			
		17-8	2Bt7	58-80	95	92	88	85	85	85	79	77	83.0	37.8	A-7-5(20)	CH			
Pepin silt loam: About 775 ft. north and 275 ft. west of the southeast corner of sec. 32, T. 24 N., R. 14 W.	Loess over pedisidiment underlain by dolostone residuum.	S93WI-091-																	
		21-4	Bt3	33-43	100	100	100	99	94	56	31	27	39.6	17.5	A-6(11)	CL			
		21-6	2Bt5	47-54	82	78	72	53	53	53	49	47	77.2	49.7	A-7-6(14)	CH			

* Mechanical analysis according to the AASHTO designation T88-57. Results from this procedure can differ somewhat from those obtained by the soil survey procedure of the Natural Resources Conservation Service. In the AASHTO procedure, the fine material is analyzed by hydrometer method and the various grain-size fractions are calculated on the basis of all material up to and including that 3 inches in diameter. In the Natural Resources Conservation Service soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from the calculation of grain-size fraction. The mechanical analysis data used in this table are not suitable for use in naming textural classes of soils.

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	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
11A: Markey-----	0-27	---	0.15-0.45	0.20-6.00	0.35-0.48	Low-----	60-99	---	---	2	2	134
	27-60	0-10	1.40-1.65	6.00-20.00	0.02-0.07	Low-----	0.5-2.0	0.15	0.15			
20A: Palms-----	0-40	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---	2	2	134
	40-60	10-30	1.45-1.75	0.20-2.00	0.12-0.22	Moderate	0.0-0.5	0.28	0.28			
Houghton-----	0-16	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---	3	2	134
	16-60	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---			
21A: Palms-----	0-40	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---	2	2	134
	40-60	10-30	1.45-1.75	0.20-2.00	0.12-0.22	Moderate	2.0-15	0.28	0.28			
40A: Markey-----	0-27	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---	2	2	134
	27-60	0-10	1.40-1.65	6.00-60.00	0.03-0.08	Low-----	0.0-0.5	0.10	0.15			
Seelyeville-----	0-12	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---	3	2	134
	12-72	---	0.15-0.45	0.20-6.00	0.35-0.45	Low-----	60-99	---	---			
114B2: Mt. Carroll-----	0-12	12-22	1.10-1.20	0.60-2.00	0.22-0.24	Low-----	1.0-4.0	0.43	0.43	5	5	56
	12-46	18-27	1.15-1.30	0.60-2.00	0.20-0.22	Moderate	0.2-0.5	0.43	0.43			
	46-80	12-18	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
114C2: Mt. Carroll-----	0-12	18-27	1.10-1.20	0.60-2.00	0.22-0.24	Low-----	1.0-4.0	0.43	0.43	5	5	56
	12-46	18-27	1.15-1.30	0.60-2.00	0.20-0.22	Moderate	0.2-0.5	0.43	0.43			
	46-80	12-18	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
115B2: Seaton-----	0-13	12-22	1.10-1.20	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	13-55	18-27	1.15-1.30	0.60-2.00	0.20-0.22	Moderate	0.0-0.5	0.43	0.43			
	55-80	10-25	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
115C2: Seaton-----	0-13	12-22	1.10-1.20	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	13-55	18-27	1.15-1.30	0.60-2.00	0.20-0.22	Moderate	0.0-0.5	0.43	0.43			
	55-80	10-25	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
115D2: Seaton-----	0-13	12-22	1.10-1.20	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	13-55	18-27	1.15-1.30	0.60-2.00	0.20-0.22	Moderate	0.0-0.5	0.43	0.43			
	55-80	10-25	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
116C2: Churchtown-----	0-9	12-22	1.35-1.40	0.60-2.00	0.20-0.22	Low-----	1.0-3.0	0.43	0.43	5	5	56
	9-26	18-27	1.35-1.40	0.60-2.00	0.17-0.22	Moderate	0.5-1.0	0.43	0.43			
	26-60	10-25	1.30-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
116D2: Churchtown-----	0-9	12-22	1.35-1.40	0.60-2.00	0.20-0.22	Low-----	1.0-3.0	0.43	0.43	5	5	56
	9-26	18-27	1.35-1.40	0.60-2.00	0.17-0.22	Moderate	0.5-1.0	0.43	0.43			
	26-60	10-25	1.30-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
116E: Churchtown-----	0-5	12-22	1.35-1.40	0.60-2.00	0.20-0.22	Low-----	3.0-7.0	0.43	0.43	5	5	56
	5-26	18-27	1.35-1.40	0.60-2.00	0.17-0.22	Moderate	0.5-1.0	0.43	0.43			
	26-60	10-25	1.30-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.43	0.43			
125B2: Pepin-----	0-9	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	9-48	18-30	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	48-58	35-80	1.25-1.45	0.06-0.20	0.10-0.15	High-----	0.0-0.5	0.32	0.32			
	58-66	12-30	1.35-1.55	0.60-2.00	0.05-0.12	Moderate	0.0-0.5	0.24	0.32			
	66	---	---	0.06-2.00	---	-----	---	---	---			
125C2: Pepin-----	0-9	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	9-48	18-30	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	48-58	35-80	1.25-1.45	0.06-0.20	0.10-0.15	High-----	0.0-0.5	0.32	0.32			
	58-66	12-30	1.35-1.55	0.60-2.00	0.05-0.12	Moderate	0.0-0.5	0.24	0.32			
	66	---	---	0.06-2.00	---	-----	---	---	---			
125D2: Pepin-----	0-9	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	9-48	18-30	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	48-58	35-80	1.25-1.45	0.06-0.20	0.10-0.15	High-----	0.0-0.5	0.32	0.32			
	58-66	12-30	1.35-1.55	0.60-2.00	0.05-0.12	Moderate	0.0-0.5	0.24	0.32			
	66	---	---	0.06-2.00	---	-----	---	---	---			
125E2: Pepin-----	0-9	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	5	5	56
	9-48	18-30	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	48-58	35-80	1.25-1.45	0.06-0.20	0.10-0.15	High-----	0.0-0.5	0.32	0.32			
	58-66	12-30	1.35-1.55	0.60-2.00	0.05-0.12	Moderate	0.0-0.5	0.24	0.32			
	66	---	---	0.06-2.00	---	-----	---	---	---			
144B2: NewGlarus-----	0-8	12-27	1.20-1.40	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	3	5	56
	8-23	18-35	1.25-1.45	0.20-2.00	0.18-0.22	Moderate	0.0-0.5	0.43	0.43			
	23-35	35-80	1.25-1.55	0.06-0.20	0.09-0.13	High-----	0.0-0.5	0.37	0.32			
	35	---	---	0.06-2.00	---	-----	---	---	---			
144C2: NewGlarus-----	0-8	12-27	1.20-1.40	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	3	5	56
	8-23	18-35	1.25-1.45	0.20-2.00	0.18-0.22	Moderate	0.0-0.5	0.43	0.43			
	23-35	35-80	1.25-1.55	0.06-0.20	0.09-0.13	High-----	0.0-0.5	0.37	0.32			
	35	---	---	0.06-2.00	---	-----	---	---	---			
144D2: NewGlarus-----	0-8	12-27	1.20-1.40	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.49	0.49	3	5	56
	8-23	18-35	1.25-1.45	0.20-2.00	0.18-0.22	Moderate	0.0-0.5	0.43	0.43			
	23-35	35-80	1.25-1.55	0.06-0.20	0.09-0.13	High-----	0.0-0.5	0.37	0.32			
	35	---	---	0.06-2.00	---	-----	---	---	---			
144E: NewGlarus-----	0-3	12-27	1.20-1.40	0.60-2.00	0.22-0.24	Low-----	3.0-7.0	0.49	0.49	3	5	56
	3-23	18-35	1.25-1.45	0.20-2.00	0.18-0.22	Moderate	0.0-0.5	0.43	0.43			
	23-35	35-80	1.25-1.55	0.06-0.20	0.09-0.13	High-----	0.0-0.5	0.37	0.32			
	35	---	---	0.06-2.00	---	-----	---	---	---			
213C2: Hixton-----	0-8	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-25	18-30	1.55-1.65	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	25-32	10-17	1.55-1.70	0.60-2.00	0.08-0.18	Low-----	0.0-0.5	0.24	0.24			
	32-37	2-6	1.55-1.70	2.00-20.00	0.03-0.07	Low-----	0.0-0.5	0.15	0.15			
	37-55	---	---	0.20-2.00	---	-----	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
213D2: Hixton-----	0-8	12-16	1.35-1.55	0.60-2.00	0.20-0.22	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-25	18-30	1.55-1.65	0.60-2.00	0.12-0.19	Moderate	0.0-0.5	0.43	0.43			
	25-32	10-17	1.55-1.70	0.60-2.00	0.08-0.18	Low-----	0.0-0.5	0.24	0.24			
	32-37	2-6	1.55-1.70	2.00-20.00	0.03-0.07	Low-----	0.0-0.5	0.15	0.15			
	37-55	---	---	0.20-2.00	---	-----	---	---	---			
213E2: Hixton-----	0-8	12-16	1.35-1.55	0.60-2.00	0.20-0.22	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-25	18-30	1.55-1.65	0.60-2.00	0.12-0.19	Moderate	0.0-0.5	0.43	0.43			
	25-32	10-17	1.55-1.70	0.60-2.00	0.08-0.18	Low-----	0.0-0.5	0.24	0.24			
	32-37	2-6	1.55-1.70	2.00-20.00	0.03-0.07	Low-----	0.0-0.5	0.15	0.15			
	37-55	---	---	0.20-2.00	---	-----	---	---	---			
224B: Elevasil-----	0-3	8-13	1.40-1.60	0.60-6.00	0.10-0.16	Low-----	1.0-2.0	0.24	0.24	3	3	86
	3-27	10-17	1.45-1.60	0.60-6.00	0.06-0.14	Low-----	0.0-0.5	0.24	0.24			
	27-31	2-10	1.50-1.70	2.00-20.00	0.03-0.10	Low-----	0.0-0.5	0.17	0.17			
	31-39	1-8	1.50-1.70	2.00-20.00	0.02-0.08	Low-----	0.0-0.5	0.15	0.15			
	39-60	---	---	0.20-2.00	---	-----	---	---	---			
224C2: Elevasil-----	0-3	8-13	1.40-1.60	0.60-6.00	0.10-0.16	Low-----	1.0-2.0	0.28	0.28	3	3	86
	3-27	10-17	1.45-1.60	0.60-6.00	0.06-0.14	Low-----	0.0-0.5	0.24	0.24			
	27-31	2-10	1.50-1.70	2.00-20.00	0.03-0.10	Low-----	0.0-0.5	0.17	0.17			
	31-39	1-8	1.50-1.70	2.00-20.00	0.02-0.08	Low-----	0.0-0.5	0.15	0.15			
	39-60	---	---	0.20-2.00	---	-----	---	---	---			
224D2: Elevasil-----	0-3	8-13	1.40-1.60	0.60-6.00	0.10-0.16	Low-----	1.0-2.0	0.28	0.28	3	3	86
	3-27	10-17	1.45-1.60	0.60-6.00	0.06-0.14	Low-----	0.0-0.5	0.24	0.24			
	27-31	2-10	1.50-1.70	2.00-20.00	0.03-0.10	Low-----	0.0-0.5	0.17	0.17			
	31-39	1-8	1.50-1.70	2.00-20.00	0.02-0.08	Low-----	0.0-0.5	0.15	0.15			
	39-60	---	---	0.20-2.00	---	-----	---	---	---			
233C: Boone-----	0-8	2-3	1.55-1.65	6.00-20.00	0.07-0.10	Low-----	3.0-7.0	0.02	0.02	3	1	250
	8-35	0-3	1.55-1.70	6.00-20.00	0.02-0.11	Low-----	0.0-0.5	0.15	0.15			
	35-60	---	---	0.20-2.00	---	-----	---	---	---			
254B2: Norden-----	0-8	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-20	18-30	1.45-1.55	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	20-37	10-18	1.45-1.55	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.32	0.32			
	37	---	---	0.06-2.00	---	-----	---	---	---			
254C2: Norden-----	0-8	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-20	18-30	1.45-1.55	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	20-37	10-18	1.45-1.55	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.32	0.32			
	37	---	---	0.06-2.00	---	-----	---	---	---			
254D2: Norden-----	0-8	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-20	18-30	1.45-1.55	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	20-37	10-18	1.45-1.55	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.32	0.32			
	37	---	---	0.06-2.00	---	-----	---	---	---			
254E2: Norden-----	0-8	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	8-20	18-30	1.45-1.55	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	20-37	10-18	1.45-1.55	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.32	0.32			
	37	---	---	0.06-2.00	---	-----	---	---	---			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
254F: Norden-----	0-3	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	3.0-7.0	0.43	0.43	3	5	56
	3-20	18-30	1.45-1.55	0.60-2.00	0.17-0.22	Moderate	0.0-0.5	0.43	0.43			
	20-37	10-18	1.45-1.55	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.32	0.32			
	37	---	---	0.06-2.00	---	-----	---	---	---			
255B2: Urne-----	0-9	10-18	1.35-1.65	0.60-6.00	0.14-0.18	Low-----	1.0-2.0	0.32	0.32	3	3	86
	9-36	10-18	1.55-1.65	0.60-2.00	0.09-0.22	Low-----	0.0-0.5	0.24	0.24			
	36-60	---	---	0.06-2.00	---	-----	---	---	---			
255C2: Urne-----	0-9	10-18	1.35-1.65	0.60-6.00	0.14-0.18	Low-----	1.0-2.0	0.32	0.32	3	3	86
	9-36	10-18	1.55-1.65	0.60-2.00	0.09-0.22	Low-----	0.0-0.5	0.24	0.24			
	36-60	---	---	0.06-2.00	---	-----	---	---	---			
255D2: Urne-----	0-9	10-18	1.35-1.65	0.60-6.00	0.14-0.18	Low-----	1.0-2.0	0.32	0.32	3	3	86
	9-36	10-18	1.55-1.65	0.60-2.00	0.09-0.22	Low-----	0.0-0.5	0.24	0.24			
	36-60	---	---	0.06-2.00	---	-----	---	---	---			
255E: Urne-----	0-2	10-18	1.35-1.65	0.60-6.00	0.14-0.18	Low-----	3.0-7.0	0.32	0.32	3	3	86
	2-36	10-18	1.55-1.65	0.60-2.00	0.09-0.22	Low-----	0.0-0.5	0.24	0.24			
	36-60	---	---	0.06-2.00	---	-----	---	---	---			
255F: Urne-----	0-2	10-18	1.35-1.65	0.60-6.00	0.14-0.18	Low-----	3.0-7.0	0.32	0.32	3	3	86
	2-36	10-18	1.55-1.65	0.60-2.00	0.09-0.22	Low-----	0.0-0.5	0.24	0.24			
	36-60	---	---	0.06-2.00	---	-----	---	---	---			
265B: Garne-----	0-10	1-8	1.35-1.65	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.05	0.05	3	2	134
	10-23	1-8	1.50-1.70	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.17	0.17			
	23-27	1-8	1.50-1.70	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.15	0.15			
	27-34	8-18	1.35-1.75	0.60-2.00	0.08-0.19	Low-----	0.0-0.5	0.32	0.32			
	34-48	---	---	0.06-2.00	---	-----	---	---	---			
	48	---	---	0.06-2.00	---	-----	---	---	---			
265C: Garne-----	0-10	1-8	1.35-1.65	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.05	0.05	3	2	134
	10-23	1-8	1.50-1.70	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.17	0.17			
	23-27	1-8	1.50-1.70	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.15	0.15			
	27-34	8-18	1.35-1.75	0.60-2.00	0.08-0.19	Low-----	0.0-0.5	0.32	0.32			
	34-48	---	---	0.06-2.00	---	-----	---	---	---			
	48	---	---	0.06-2.00	---	-----	---	---	---			
303A: Boguscreek-----	0-9	8-18	1.25-1.40	0.60-2.00	0.22-0.24	Low-----	2.0-4.0	0.32	0.32	4	5	56
	9-50	8-18	1.25-1.40	0.60-2.00	0.22-0.24	Low-----	2.0-4.0	0.32	0.32			
	50-57	8-18	1.35-1.50	0.60-6.00	0.12-0.22	Low-----	0.5-1.0	0.32	0.32			
	57-80	1-4	1.50-1.65	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
313D2: Plumcreek-----	0-4	10-25	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	5	5	56
	4-7	10-20	1.35-1.45	0.60-2.00	0.20-0.22	Low-----	0.0-1.0	0.37	0.37			
	7-28	18-27	1.45-1.65	0.60-2.00	0.15-0.22	Moderate	0.0-0.5	0.43	0.43			
	28-36	8-25	1.55-1.70	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
	36-60	8-30	1.55-1.70	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
313F: Plumcreek-----	0-4	10-25	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	5	5	56
	4-7	10-20	1.35-1.45	0.60-2.00	0.20-0.22	Low-----	0.0-1.0	0.37	0.37			
	7-28	18-27	1.45-1.65	0.60-2.00	0.15-0.22	Moderate	0.0-0.5	0.43	0.43			
	28-36	8-25	1.55-1.70	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
	36-60	8-30	1.55-1.70	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
316B2: Ella-----	0-8	10-25	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	2.0-3.0	0.37	0.37	5	5	56
	8-55	18-30	1.40-1.65	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	55-72	10-30	1.50-1.65	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
	72-80	10-30	1.50-1.65	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
316C2: Ella-----	0-8	10-25	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	2.0-3.0	0.37	0.37	5	5	56
	8-55	18-30	1.40-1.65	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	55-72	10-30	1.50-1.65	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
	72-80	10-30	1.50-1.65	0.60-2.00	0.10-0.18	Moderate	0.0-0.5	0.32	0.32			
318A: Bearpen-----	0-8	10-25	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	2.0-4.0	0.32	0.32	5	5	56
	8-18	12-22	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	1.0-4.0	0.32	0.32			
	18-41	18-30	1.45-1.65	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	41-50	10-30	1.55-1.70	0.60-2.00	0.10-0.18	Low-----	0.0-0.5	0.32	0.32			
	50-60	10-18	1.55-1.70	0.60-2.00	0.08-0.16	Low-----	0.0-0.5	0.32	0.32			
326B2: Medary-----	0-7	15-27	1.35-1.60	0.60-2.00	0.22-0.24	Low-----	1.0-2.0	0.43	0.43	3	5	56
	7-14	15-40	1.55-1.65	0.20-2.00	0.18-0.22	Moderate	0.5-1.0	0.37	0.37			
	14-30	35-60	1.55-1.70	0.06-0.20	0.11-0.20	High-----	0.0-0.5	0.37	0.37			
	30-60	25-60	1.30-1.70	0.06-0.20	0.09-0.20	High-----	0.0-0.5	0.28	0.28			
403A: Dakota-----	0-10	12-22	1.40-1.50	0.60-2.00	0.22-0.24	Low-----	2.0-5.0	0.28	0.28	4	5	56
	10-13	12-22	1.40-1.50	0.60-2.00	0.20-0.24	Low-----	1.0-4.0	0.37	0.37			
	13-35	18-30	1.30-1.55	0.60-6.00	0.12-0.19	Moderate	0.5-1.0	0.32	0.32			
	35-38	4-11	1.55-1.65	6.00-60.00	0.02-0.11	Low-----	0.0-0.5	0.10	0.15			
	38-60	1-4	1.55-1.65	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
413A: Rasset-----	0-18	6-15	1.35-1.55	2.00-6.00	0.13-0.15	Low-----	2.0-4.0	0.17	0.17	4	3	86
	18-30	10-18	1.40-1.60	2.00-6.00	0.12-0.19	Low-----	1.0-2.0	0.20	0.20			
	30-42	2-10	1.45-1.65	6.00-20.00	0.06-0.11	Low-----	0.5-1.0	0.17	0.17			
	42-60	1-5	1.50-1.70	6.00-40.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.10			
413B: Rasset-----	0-18	6-15	1.35-1.55	2.00-6.00	0.13-0.15	Low-----	2.0-4.0	0.17	0.17	4	3	86
	18-30	10-18	1.40-1.60	2.00-6.00	0.12-0.19	Low-----	1.0-2.0	0.20	0.20			
	30-42	2-10	1.45-1.65	6.00-20.00	0.06-0.11	Low-----	0.5-1.0	0.17	0.17			
	42-60	1-5	1.50-1.70	6.00-40.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.10			
423A: Meridian-----	0-9	8-20	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-3.0	0.37	0.37	4	5	56
	9-28	18-30	1.40-1.70	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	28-32	15-25	1.55-1.65	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.32	0.32			
	32-72	1-4	1.55-1.65	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
423B2: Meridian-----	0-9	8-20	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-3.0	0.37	0.37	4	5	56
	9-28	18-30	1.40-1.70	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	28-32	15-25	1.55-1.65	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.32	0.32			
	32-72	1-4	1.55-1.65	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
429A:												
Lows-----	0-6	12-22	1.20-1.55	0.60-2.00	0.20-0.22	Low-----	3.0-5.0	0.24	0.24	4	5	56
	6-13	10-22	1.20-1.55	0.60-2.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
	13-28	18-27	1.55-1.65	0.60-6.00	0.16-0.19	Moderate	0.0-0.5	0.32	0.32			
	28-60	2-8	1.75-1.85	6.00-60.00	0.02-0.11	Low-----	0.0-0.5	0.15	0.15			
432A:												
Kevilar-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-29	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	29-50	1-6	1.55-1.70	6.00-20.00	0.05-0.10	Low-----	0.0-0.5	0.15	0.15			
	50-80	8-18	1.55-1.70	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
432B:												
Kevilar-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-29	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	29-50	1-6	1.55-1.70	6.00-20.00	0.05-0.10	Low-----	0.0-0.5	0.15	0.15			
	50-80	8-18	1.55-1.70	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
432C2:												
Kevilar-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-29	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	29-50	1-6	1.55-1.70	6.00-20.00	0.05-0.10	Low-----	0.0-0.5	0.15	0.15			
	50-80	8-18	1.55-1.70	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
433A:												
Forkhorn-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-25	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	25-32	3-10	1.50-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.17			
	32-46	2-8	1.55-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.05	0.10			
	46-72	1-5	1.60-1.70	6.00-60.00	0.01-0.05	Low-----	0.0-0.5	0.05	0.10			
433B:												
Forkhorn-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-25	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	25-32	3-10	1.50-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.17			
	32-46	2-8	1.55-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.05	0.10			
	46-72	1-5	1.60-1.70	6.00-60.00	0.01-0.05	Low-----	0.0-0.5	0.05	0.10			
433C2:												
Forkhorn-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	2.0-3.0	0.24	0.24	4	3	86
	9-25	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	25-32	3-10	1.50-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.17			
	32-46	2-8	1.55-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.05	0.10			
	46-72	1-5	1.60-1.70	6.00-60.00	0.01-0.05	Low-----	0.0-0.5	0.05	0.10			
436A:												
Rusktown-----	0-9	5-15	1.45-1.65	0.60-6.00	0.13-0.15	Low-----	1.0-3.0	0.24	0.24	4	3	86
	9-25	6-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.24	0.24			
	25-38	3-10	1.50-1.70	6.00-60.00	0.03-0.11	Low-----	0.0-0.5	0.10	0.15			
	38-45	2-8	1.55-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
	45-72	1-5	1.60-1.70	6.00-60.00	0.01-0.05	Low-----	0.0-0.5	0.05	0.10			
438A:												
Hoopeston-----	0-13	8-18	1.35-1.70	0.60-6.00	0.12-0.15	Low-----	2.0-3.0	0.20	0.20	4	3	86
	13-22	12-18	1.45-1.70	0.60-6.00	0.12-0.17	Low-----	0.2-1.0	0.28	0.28			
	22-72	2-10	1.50-1.70	6.00-20.00	0.05-0.10	Low-----	0.1-0.5	0.17	0.17			
453A:												
Burkhardt-----	0-10	5-13	1.35-1.55	2.00-6.00	0.11-0.15	Low-----	2.0-3.0	0.17	0.17	3	3	86
	10-17	8-18	1.55-1.65	2.00-6.00	0.10-0.19	Low-----	0.5-1.0	0.24	0.24			
	17-60	1-6	1.50-1.80	6.00-20.00	0.02-0.04	Low-----	0.0-0.5	0.10	0.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
453B: Burkhardt-----	0-10	5-13	1.35-1.55	2.00-6.00	0.11-0.15	Low-----	2.0-3.0	0.17	0.17	3	3	86
	10-17	8-18	1.55-1.65	2.00-6.00	0.10-0.19	Low-----	0.5-1.0	0.24	0.24			
	17-60	1-6	1.50-1.80	6.00-20.00	0.02-0.04	Low-----	0.0-0.5	0.10	0.15			
501A: Finchford-----	0-10	5-10	1.50-1.55	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.05	0.05	5	2	134
	10-19	5-10	1.50-1.55	6.00-20.00	0.10-0.12	Low-----	1.0-2.0	0.15	0.15			
	19-26	2-8	1.50-1.60	6.00-60.00	0.03-0.10	Low-----	0.0-1.0	0.10	0.15			
	26-80	2-5	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
501B: Finchford-----	0-10	5-10	1.50-1.55	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.05	0.05	5	2	134
	10-19	5-10	1.50-1.55	6.00-20.00	0.10-0.12	Low-----	1.0-2.0	0.15	0.15			
	19-26	2-8	1.50-1.60	6.00-60.00	0.03-0.10	Low-----	0.0-1.0	0.10	0.15			
	26-80	2-5	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
502B2: Chelsea-----	0-9	3-8	1.50-1.55	6.00-20.00	0.06-0.08	Low-----	0.5-1.0	0.05	0.05	5	1	310
	9-60	5-10	1.55-1.70	6.00-20.00	0.06-0.08	Low-----	0.0-0.5	0.17	0.17			
502C2: Chelsea-----	0-9	3-8	1.50-1.55	6.00-20.00	0.06-0.08	Low-----	0.5-1.0	0.05	0.05	5	1	310
	9-60	5-10	1.55-1.70	6.00-20.00	0.06-0.08	Low-----	0.0-0.5	0.17	0.17			
506A: Komro-----	0-10	3-10	1.40-1.60	6.00-20.00	0.10-0.12	Low-----	1.0-3.0	0.05	0.05	5	2	134
	10-18	2-8	1.45-1.65	6.00-60.00	0.04-0.12	Low-----	0.5-2.0	0.17	0.17			
	18-38	2-8	1.55-1.70	6.00-60.00	0.02-0.11	Low-----	0.0-0.5	0.15	0.15			
	38-72	1-5	1.55-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.15	0.15			
508A: Farrington-----	0-9	3-10	1.40-1.60	2.00-20.00	0.08-0.12	Low-----	1.0-3.0	0.05	0.05	5	2	134
	9-18	2-8	1.45-1.65	6.00-60.00	0.04-0.12	Low-----	1.0-2.0	0.17	0.17			
	18-41	2-8	1.55-1.70	6.00-60.00	0.03-0.10	Low-----	0.0-0.5	0.17	0.17			
	41-72	1-5	1.55-1.70	6.00-60.00	0.02-0.06	Low-----	0.0-0.5	0.05	0.05			
510B: Boplain-----	0-9	1-6	1.35-1.60	6.00-20.00	0.07-0.09	Low-----	0.5-2.0	0.02	0.02	3	1	220
	9-32	1-10	1.45-1.65	6.00-60.00	0.03-0.11	Low-----	0.0-0.5	0.15	0.15			
	32-37	0-7	1.45-1.70	6.00-20.00	0.04-0.08	Low-----	0.0-0.5	0.15	0.15			
	37-60	---	---	0.20-2.00	---	-----	---	---	---			
510C: Boplain-----	0-9	1-6	1.35-1.60	6.00-20.00	0.07-0.09	Low-----	0.5-2.0	0.02	0.02	3	1	220
	9-32	1-10	1.45-1.65	6.00-60.00	0.03-0.11	Low-----	0.0-0.5	0.15	0.15			
	32-37	0-7	1.45-1.70	6.00-20.00	0.04-0.08	Low-----	0.0-0.5	0.15	0.15			
	37-60	---	---	0.20-2.00	---	-----	---	---	---			
510F: Boplain-----	0-9	1-6	1.35-1.60	6.00-20.00	0.07-0.09	Low-----	0.5-2.0	0.02	0.02	3	1	220
	9-32	1-10	1.45-1.65	6.00-60.00	0.03-0.11	Low-----	0.0-0.5	0.15	0.15			
	32-37	0-7	1.45-1.70	6.00-20.00	0.04-0.08	Low-----	0.0-0.5	0.15	0.15			
	37-60	---	---	0.20-2.00	---	-----	---	---	---			
511A: Plainfield-----	0-4	2-5	1.50-1.65	6.00-20.00	0.04-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	4-32	1-7	1.50-1.65	6.00-20.00	0.04-0.07	Low-----	0.1-0.5	0.15	0.15			
	32-80	0-4	1.50-1.70	6.00-60.00	0.03-0.07	Low-----	0.1-0.2	0.10	0.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
511B: Plainfield-----	0-4	2-5	1.50-1.65	6.00-20.00	0.04-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	4-32	1-7	1.50-1.65	6.00-20.00	0.04-0.07	Low-----	0.1-0.5	0.15	0.15			
	32-80	0-4	1.50-1.70	6.00-60.00	0.03-0.07	Low-----	0.1-0.2	0.10	0.15			
511C: Plainfield-----	0-4	2-5	1.50-1.65	6.00-20.00	0.04-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	4-32	1-7	1.50-1.65	6.00-20.00	0.04-0.07	Low-----	0.1-0.5	0.15	0.15			
	32-80	0-4	1.50-1.70	6.00-60.00	0.03-0.07	Low-----	0.1-0.2	0.10	0.15			
511F: Plainfield-----	0-4	2-5	1.50-1.65	6.00-20.00	0.04-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	4-32	1-7	1.50-1.65	6.00-20.00	0.04-0.07	Low-----	0.1-0.5	0.15	0.15			
	32-80	0-4	1.50-1.70	6.00-60.00	0.03-0.07	Low-----	0.1-0.2	0.10	0.15			
512B: Drammen-----	0-9	1-8	1.50-1.65	6.00-20.00	0.09-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-44	1-8	1.50-1.65	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.17	0.17			
	44-65	1-10	1.40-1.60	2.00-6.00	0.07-0.12	Low-----	0.0-0.5	0.17	0.17			
	65-72	0-5	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.10			
512C: Drammen-----	0-9	1-8	1.50-1.65	6.00-20.00	0.09-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-44	1-8	1.50-1.65	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.17	0.17			
	44-65	1-10	1.40-1.60	2.00-6.00	0.07-0.12	Low-----	0.0-0.5	0.17	0.17			
	65-72	0-5	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.10			
512D: Drammen-----	0-9	1-8	1.50-1.65	6.00-20.00	0.09-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-44	1-8	1.50-1.65	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.17	0.17			
	44-65	1-10	1.40-1.60	2.00-6.00	0.07-0.12	Low-----	0.0-0.5	0.17	0.17			
	65-72	0-5	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.10			
516A: Aldo-----	0-7	2-5	1.50-1.65	6.00-20.00	0.07-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	7-42	2-7	1.50-1.65	6.00-60.00	0.03-0.11	Low-----	0.5-1.0	0.15	0.15			
	42-80	1-4	1.50-1.65	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
546A: Prissel-----	0-9	1-6	1.30-1.50	6.00-20.00	0.10-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-48	1-6	1.40-1.60	6.00-20.00	0.06-0.11	Low-----	0.5-1.0	0.15	0.15			
	48-56	8-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
	56-72	1-6	1.50-1.70	6.00-20.00	0.05-0.07	Low-----	0.0-0.5	0.15	0.15			
546B: Prissel-----	0-9	1-6	1.30-1.50	6.00-20.00	0.10-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-48	1-6	1.40-1.60	6.00-20.00	0.06-0.11	Low-----	0.5-1.0	0.15	0.15			
	48-56	8-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
	56-72	1-6	1.50-1.70	6.00-20.00	0.05-0.07	Low-----	0.0-0.5	0.15	0.15			
546F: Prissel-----	0-9	1-6	1.30-1.50	6.00-20.00	0.10-0.12	Low-----	0.5-2.0	0.10	0.10	5	2	134
	9-48	1-6	1.40-1.60	6.00-20.00	0.06-0.11	Low-----	0.5-1.0	0.15	0.15			
	48-56	8-18	1.45-1.65	0.60-6.00	0.12-0.19	Low-----	0.0-0.5	0.24	0.24			
	56-72	1-6	1.50-1.70	6.00-20.00	0.05-0.07	Low-----	0.0-0.5	0.15	0.15			
561B: Tarr-----	0-6	3-5	1.35-1.65	6.00-20.00	0.08-0.10	Low-----	0.5-2.0	0.02	0.02	5	1	250
	6-34	3-8	1.50-1.65	6.00-20.00	0.05-0.07	Low-----	0.0-0.5	0.15	0.15			
	34-62	3-8	1.50-1.65	6.00-20.00	0.05-0.07	Low-----	0.0-0.5	0.15	0.15			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
566A: Tint-----	0-9	4-8	1.35-1.65	6.00-20.00	0.06-0.09	Low-----	0.5-2.0	0.02	0.02	5	1	250
	9-34	0-5	1.45-1.65	6.00-20.00	0.05-0.08	Low-----	0.0-0.5	0.15	0.15			
	34-60	0-5	1.50-1.70	6.00-20.00	0.04-0.07	Low-----	0.0-0.5	0.15	0.15			
589A: Newson-----	0-8	2-10	1.35-1.65	6.00-20.00	0.05-0.10	Low-----	10-20	0.05	0.05	5	2	134
	8-25	1-4	1.70-1.80	6.00-20.00	0.05-0.11	Low-----	0.1-2.0	0.17	0.17			
	25-64	1-4	1.70-1.80	6.00-60.00	0.02-0.11	Low-----	0.0-0.5	0.10	0.15			
616B: Chaseburg-----	0-4	12-16	1.35-1.55	0.60-2.00	0.22-0.24	Low-----	1.0-3.0	0.37	0.37	5	5	56
	4-60	10-18	1.55-1.65	0.60-2.00	0.18-0.22	Low-----	0.0-2.0	0.37	0.37			
626A: Arenzville-----	0-25	10-18	1.20-1.55	0.60-2.00	0.20-0.24	Low-----	1.0-3.0	0.37	0.37	5	5	56
	25-40	10-30	1.25-1.45	0.60-2.00	0.18-0.22	Low-----	0.0-2.0	0.37	0.37			
	40-60	10-20	1.20-1.40	0.60-2.00	0.20-0.22	Low-----	0.0-0.5	0.37	0.37			
628A: Orion-----	0-8	10-18	1.20-1.30	0.60-2.00	0.22-0.24	Low-----	1.0-3.0	0.37	0.37	5	5	56
	8-32	10-18	1.20-1.30	0.60-2.00	0.20-0.22	Low-----	1.0-3.0	0.37	0.37			
	32-40	10-30	1.25-1.45	0.60-2.00	0.18-0.22	Low-----	3.0-8.0	0.37	0.37			
	40-60	10-18	1.20-1.40	0.60-2.00	0.18-0.22	Low-----	0.0-0.5	0.37	0.37			
629A: Ettrick-----	0-16	15-27	1.25-1.35	0.60-2.00	0.22-0.29	Low-----	4.0-12	0.32	0.32	5	6	48
	16-35	20-35	1.30-1.45	0.20-0.60	0.18-0.29	Moderate	0.5-2.0	0.28	0.28			
	35-60	8-27	1.30-1.50	0.60-6.00	0.20-0.25	Low-----	0.0-1.0	0.28	0.28			
646A: Dunnbot-----	0-9	8-18	1.20-1.55	0.60-6.00	0.16-0.18	Low-----	1.0-4.0	0.24	0.24	4	3	86
	9-36	8-18	1.45-1.55	0.60-6.00	0.13-0.22	Low-----	1.0-4.0	0.20	0.20			
	36-45	8-18	1.55-1.70	0.60-6.00	0.13-0.18	Low-----	0.5-1.0	0.24	0.24			
	45-72	1-6	1.60-1.70	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
656A: Scotah-----	0-4	2-15	1.30-1.60	6.00-20.00	0.10-0.12	Low-----	0.5-3.0	0.05	0.05	5	2	134
	4-22	0-10	1.35-1.60	6.00-20.00	0.07-0.12	Low-----	0.5-1.0	0.17	0.17			
	22-60	0-10	1.45-1.60	6.00-60.00	0.02-0.07	Low-----	0.0-0.5	0.10	0.15			
826B2: Hersey-----	0-8	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	2.0-3.0	0.43	0.43	5	5	56
	8-36	18-27	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	36-58	12-27	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-0.5	0.43	0.43			
	58-115	12-30	1.55-1.65	0.20-2.00	0.12-0.17	Moderate	0.0-0.5	0.37	0.37			
826C2: Hersey-----	0-8	10-20	1.35-1.45	0.60-2.00	0.22-0.24	Low-----	2.0-3.0	0.43	0.43	5	5	56
	8-36	18-27	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-1.0	0.43	0.43			
	36-58	12-27	1.40-1.50	0.60-2.00	0.20-0.22	Moderate	0.0-0.5	0.43	0.43			
	58-115	12-30	1.55-1.65	0.20-2.00	0.12-0.17	Moderate	0.0-0.5	0.37	0.37			
1135F: Dorerton-----	0-3	10-18	1.30-1.40	0.60-2.00	0.20-0.24	Low-----	3.0-7.0	0.32	0.32	3	5	56
	3-10	5-15	1.30-1.40	0.60-6.00	0.12-0.19	Low-----	0.5-1.0	0.32	0.32			
	10-18	18-35	1.30-1.45	0.60-2.00	0.17-0.19	Moderate	0.5-1.0	0.28	0.28			
	18-30	20-35	1.20-1.45	0.60-2.00	0.08-0.14	Moderate	0.0-0.5	0.24	0.32			
	30-60	2-25	1.20-1.45	2.00-6.00	0.03-0.09	Low-----	0.0-0.5	0.10	0.17			

Physical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Shrink- swell potential	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
	In	Pct	g/cc	In/hr	In/in		Pct					
1135F: Elbaville-----	0-4	10-27	1.30-1.50	0.60-2.00	0.20-0.24	Low-----	3.0-7.0	0.43	0.43	4	5	56
	4-16	10-20	1.30-1.50	0.60-2.00	0.20-0.22	Low-----	0.5-1.0	0.43	0.43			
	16-20	18-35	1.35-1.50	0.20-2.00	0.16-0.19	Moderate	0.0-0.5	0.43	0.43			
	20-25	35-50	1.25-1.35	0.20-0.60	0.13-0.16	Moderate	0.0-0.5	0.32	0.32			
	25-36	20-35	1.35-1.50	0.60-2.00	0.12-0.14	Moderate	0.0-0.5	0.24	0.43			
	36-60	5-18	1.40-1.65	2.00-6.00	0.06-0.10	Low-----	0.0-0.5	0.10	0.17			
1145F: Gaphill-----	0-5	8-15	1.35-1.65	0.60-6.00	0.10-0.15	Low-----	4.0-8.0	0.24	0.24	4	3	86
	5-11	5-12	1.40-1.70	0.60-6.00	0.09-0.19	Low-----	0.0-1.0	0.24	0.24			
	11-32	8-17	1.40-1.70	0.60-6.00	0.09-0.19	Low-----	0.0-0.5	0.24	0.24			
	32-50	2-8	1.45-1.70	6.00-20.00	0.04-0.10	Low-----	0.0-0.5	0.15	0.15			
	50-56	1-6	1.50-1.75	6.00-20.00	0.02-0.06	Low-----	0.0-0.5	0.15	0.15			
	56-66	---	---	0.20-2.00	---	-----	---	---	---			
Rockbluff-----	0-4	2-6	1.55-1.65	6.00-20.00	0.10-0.12	Low-----	4.0-8.0	0.10	0.10	4	2	134
	4-9	1-5	1.55-1.70	6.00-20.00	0.07-0.12	Low-----	0.0-1.0	0.10	0.10			
	9-35	1-5	1.55-1.70	6.00-20.00	0.03-0.11	Low-----	0.0-0.5	0.15	0.15			
	35-52	0-3	1.55-1.70	6.00-20.00	0.03-0.08	Low-----	0.0-0.5	0.15	0.15			
	52-60	---	---	0.20-2.00	---	-----	---	---	---			
1155F: Brodale-----	0-6	5-18	1.15-1.30	0.60-2.00	0.06-0.12	Low-----	3.0-7.0	0.20	0.28	3	5	56
	6-50	5-18	1.20-1.35	0.60-6.00	0.04-0.09	Low-----	0.0-1.0	0.20	0.24			
	50	---	---	2.00-20.00	---	-----	---	---	---			
Bellechester----	0-16	1-3	1.45-1.60	6.00-20.00	0.06-0.09	Low-----	1.0-4.0	0.02	0.02	4	1	220
	16-42	2-8	1.50-1.65	6.00-20.00	0.04-0.08	Low-----	0.0-1.0	0.15	0.15			
	42	---	---	0.20-2.00	---	-----	---	---	---			
Rock outcrop----	0-60	---	---	0.06-0.60	---	-----	---	---	---	---	---	---
1224F: Boone-----	0-3	2-3	1.55-1.65	6.00-20.00	0.07-0.10	Low-----	3.0-7.0	0.02	0.02	3	1	250
	3-8	1-5	1.55-1.70	6.00-20.00	0.03-0.12	Low-----	0.0-0.5	0.15	0.15			
	8-35	0-3	1.55-1.70	6.00-20.00	0.02-0.11	Low-----	0.0-0.5	0.15	0.15			
	35-60	---	---	0.20-2.00	---	-----	---	---	---			
Elevasil-----	0-3	8-13	1.40-1.60	0.60-6.00	0.10-0.16	Low-----	3.0-7.0	0.24	0.24	3	3	86
	3-27	10-17	1.45-1.60	0.60-6.00	0.06-0.14	Low-----	0.0-0.5	0.24	0.24			
	27-31	2-10	1.50-1.70	2.00-20.00	0.03-0.10	Low-----	0.0-0.5	0.17	0.17			
	31-39	1-8	1.50-1.70	2.00-20.00	0.02-0.08	Low-----	0.0-0.5	0.15	0.15			
	39-60	---	---	0.20-2.00	---	-----	---	---	---			
1648A: Northbend-----	0-7	10-14	1.35-1.45	0.60-2.00	0.20-0.24	Low-----	3.0-7.0	0.37	0.37	4	5	56
	7-34	5-17	1.35-1.50	0.60-2.00	0.12-0.22	Low-----	0.1-1.0	0.43	0.43			
	34-36	4-8	1.45-1.70	2.00-6.00	0.08-0.13	Low-----	0.1-1.0	0.17	0.17			
	36-60	2-5	1.55-1.70	6.00-20.00	0.04-0.10	Low-----	0.1-1.0	0.15	0.15			
Ettrick-----	0-16	15-27	1.25-1.35	0.60-2.00	0.22-0.29	Low-----	4.0-12	0.32	0.32	5	6	48
	16-35	20-35	1.30-1.45	0.20-0.60	0.18-0.29	Moderate	0.5-2.0	0.28	0.28			
	35-60	8-27	1.30-1.50	0.60-6.00	0.20-0.25	Low-----	0.0-1.0	0.28	0.28			
1658A: Alganssee-----	0-4	5-15	1.35-1.50	2.00-6.00	0.16-0.18	Low-----	3.0-7.0	0.24	0.24	5	3	86
	4-31	0-15	1.40-1.65	6.00-20.00	0.06-0.11	Low-----	0.0-0.5	0.17	0.17			
	31-60	0-10	1.40-1.65	6.00-60.00	0.02-0.10	Low-----	0.0-0.5	0.10	0.15			
Kalmarville-----	0-6	13-23	1.35-1.45	0.60-2.00	0.20-0.24	Low-----	3.0-7.0	0.32	0.32	4	5	56
	6-42	8-18	1.40-1.50	2.00-6.00	0.13-0.18	Low-----	0.0-1.0	0.20	0.20			
	42-60	2-5	1.55-1.65	6.00-60.00	0.06-0.09	Low-----	0.0-0.5	0.10	0.10			

Chemical Properties of the Soils

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

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
11A:					
Markey-----	0-27	---	110-180	5.1-7.3	---
	27-60	0-10	2.0-8.0	5.6-8.4	0-10
20A:					
Palms-----	0-40	---	150-200	5.1-7.3	---
	40-60	10-30	5.0-60.0	6.1-8.4	0-20
Houghton-----	0-16	---	150-230	5.1-7.3	---
	16-60	---	150-230	5.1-7.3	---
21A:					
Palms-----	0-40	---	150-200	5.1-7.3	---
	40-60	10-30	5.0-60.0	6.1-8.4	0-20
40A:					
Markey-----	0-27	---	150-230	5.1-7.3	---
	27-60	0-10	1.0-3.0	5.1-6.5	0-5
Seelyeville-----	0-12	---	140-200	5.1-7.3	---
	12-72	---	140-200	4.5-7.3	---
114B2:					
Mt. Carroll-----	0-12	12-22	15.0-24.0	5.1-7.3	---
	12-46	18-27	11.0-17.0	5.1-7.3	---
	46-80	12-18	7.0-11.0	5.1-8.4	0-15
114C2:					
Mt. Carroll-----	0-12	18-27	15.0-24.0	5.1-7.3	---
	12-46	18-27	11.0-17.0	5.1-7.3	---
	46-80	12-18	7.0-11.0	5.1-8.4	0-15
115B2:					
Seaton-----	0-13	12-22	10.0-18.0	5.1-7.3	---
	13-55	18-27	10.0-18.0	5.1-7.3	---
	55-80	10-25	10.0-15.0	5.1-8.4	0-15
115C2:					
Seaton-----	0-13	12-22	10.0-18.0	5.1-7.3	---
	13-55	18-27	10.0-18.0	5.1-7.3	---
	55-80	10-25	10.0-15.0	5.1-8.4	0-15
115D2:					
Seaton-----	0-13	12-22	10.0-18.0	5.1-7.3	---
	13-55	18-27	10.0-18.0	5.1-7.3	---
	55-80	10-25	10.0-15.0	5.1-8.4	0-15
116C2:					
Churchtown-----	0-9	12-22	20.0-25.0	5.1-7.3	---
	9-26	18-27	20.0-25.0	5.1-7.3	---
	26-60	10-25	20.0-25.0	5.1-7.3	---
116D2:					
Churchtown-----	0-9	12-22	20.0-25.0	5.1-7.3	---
	9-26	18-27	20.0-25.0	5.1-7.3	---
	26-60	10-25	20.0-25.0	5.1-7.3	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
116E:					
Churchtown-----	0-5	12-22	20.0-25.0	5.1-7.3	---
	5-26	18-27	20.0-25.0	5.1-7.3	---
	26-60	10-25	20.0-25.0	5.1-7.3	---
125B2:					
Pepin-----	0-9	10-20	4.0-20.0	5.1-7.3	---
	9-48	18-30	4.0-25.0	5.1-7.3	---
	48-58	35-80	7.0-50.0	4.5-6.5	---
	58-66	12-30	2.0-25.0	5.6-7.8	0-15
	66	---	---	---	---
125C2:					
Pepin-----	0-9	10-20	4.0-20.0	5.1-7.3	---
	9-48	18-30	4.0-25.0	5.1-7.3	---
	48-58	35-80	7.0-50.0	4.5-6.5	---
	58-66	12-30	2.0-25.0	5.6-7.8	0-15
	66	---	---	---	---
125D2:					
Pepin-----	0-9	10-20	4.0-20.0	5.1-7.3	---
	9-48	18-30	4.0-25.0	5.1-7.3	---
	48-58	35-80	7.0-50.0	4.5-6.5	---
	58-66	12-30	2.0-25.0	5.6-7.8	0-15
	66	---	---	---	---
125E2:					
Pepin-----	0-9	10-20	4.0-20.0	5.1-7.3	---
	9-48	18-30	4.0-25.0	5.1-7.3	---
	48-58	35-80	7.0-50.0	4.5-6.5	---
	58-66	12-30	2.0-25.0	5.6-7.8	0-15
	66	---	---	---	---
144B2:					
NewGlarus-----	0-8	12-27	4.0-20.0	5.1-7.3	---
	8-23	18-35	4.0-25.0	5.1-7.3	---
	23-35	35-80	7.0-50.0	4.5-6.5	---
	35-60	---	---	---	---
144C2:					
NewGlarus-----	0-8	12-27	4.0-20.0	5.1-7.3	---
	8-23	18-35	4.0-25.0	5.1-7.3	---
	23-35	35-80	7.0-50.0	4.5-6.5	---
	35	---	---	---	---
144D2:					
NewGlarus-----	0-8	12-27	4.0-20.0	5.1-7.3	---
	8-23	18-35	4.0-25.0	5.1-7.3	---
	23-35	35-80	7.0-50.0	4.5-6.5	---
	35	---	---	---	---
144E:					
NewGlarus-----	0-3	12-27	4.0-20.0	5.1-7.3	---
	3-23	18-35	4.0-25.0	5.1-7.3	---
	23-35	35-80	7.0-50.0	4.5-6.5	---
	35	---	---	---	---
213C2:					
Hixton-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-25	18-30	4.0-25.0	5.1-7.3	---
	25-32	10-17	2.0-15.0	5.1-6.5	---
	32-37	2-6	0.0-6.0	4.5-6.5	---
	37-55	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
213D2:					
Hixton-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-25	18-30	4.0-25.0	5.1-7.3	---
	25-32	10-17	2.0-15.0	5.1-6.5	---
	32-37	2-6	0.0-6.0	4.5-6.5	---
	37-55	---	---	---	---
213E2:					
Hixton-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-25	18-30	4.0-25.0	5.1-7.3	---
	25-32	10-17	2.0-15.0	5.1-6.5	---
	32-37	2-6	0.0-6.0	4.5-6.5	---
	37-55	---	---	---	---
224B:					
Elevasil-----	0-3	8-13	4.0-15.0	4.5-6.5	---
	3-27	10-17	2.0-15.0	4.5-6.5	---
	27-31	2-10	0.0-9.0	4.5-6.5	---
	31-39	1-8	0.0-7.0	4.5-6.5	---
	39-60	---	---	---	---
224C2:					
Elevasil-----	0-3	8-13	4.0-15.0	4.5-6.5	---
	3-27	10-17	2.0-15.0	4.5-6.5	---
	27-31	2-10	0.0-9.0	4.5-6.5	---
	31-39	1-8	0.0-7.0	4.5-6.5	---
	39-60	---	---	---	---
224D2:					
Elevasil-----	0-3	8-13	4.0-15.0	4.5-6.5	---
	3-27	10-17	2.0-15.0	4.5-6.5	---
	27-31	2-10	0.0-9.0	4.5-6.5	---
	31-39	1-8	0.0-7.0	4.5-6.5	---
	39-60	---	---	---	---
233C:					
Boone-----	0-8	2-3	0.0-4.0	4.5-6.5	---
	8-35	0-3	0.0-3.0	4.5-6.5	---
	35-60	---	---	---	---
254B2:					
Norden-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-20	18-30	4.0-25.0	5.1-7.3	---
	20-37	10-18	2.0-15.0	5.1-7.3	---
	37	---	---	---	---
254C2:					
Norden-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-20	18-30	4.0-25.0	5.1-7.3	---
	20-37	10-18	2.0-15.0	5.1-7.3	---
	37	---	---	---	---
254D2:					
Norden-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-20	18-30	4.0-25.0	5.1-7.3	---
	20-37	10-18	2.0-15.0	5.1-7.3	---
	37	---	---	---	---
254E2:					
Norden-----	0-8	12-16	4.0-15.0	5.1-7.3	---
	8-20	18-30	4.0-25.0	5.1-7.3	---
	20-37	10-18	2.0-15.0	5.1-7.3	---
	37	---	---	---	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct		meq/100g	pH	Pct
254F:						
Norden-----	0-3	12-16		4.0-15.0	5.1-7.3	---
	3-20	18-30		4.0-25.0	5.1-7.3	---
	20-37	10-18		2.0-15.0	5.1-7.3	---
	37	---		---	---	---
255B2:						
Urne-----	0-9	10-18		6.0-20.0	5.1-7.3	---
	9-36	10-18		2.0-15.0	5.1-7.3	---
	36-60	---		---	---	---
255C2:						
Urne-----	0-9	10-18		6.0-20.0	5.1-7.3	---
	9-36	10-18		2.0-15.0	5.1-7.3	---
	36-60	---		---	---	---
255D2:						
Urne-----	0-9	10-18		6.0-20.0	5.1-7.3	---
	9-36	10-18		2.0-15.0	5.1-7.3	---
	36-60	---		---	---	---
255E:						
Urne-----	0-2	10-18		6.0-20.0	5.1-7.3	---
	2-36	10-18		2.0-15.0	5.1-7.3	---
	36-60	---		---	---	---
255F:						
Urne-----	0-2	10-18		6.0-20.0	5.1-7.3	---
	2-36	10-18		2.0-15.0	5.1-7.3	---
	36-60	---		---	---	---
265B:						
Garne-----	0-10	1-8		2.0-10.0	5.1-7.3	---
	10-23	1-8		2.0-10.0	5.1-7.3	---
	23-27	1-8		1.0-7.0	5.1-7.3	---
	27-34	8-18		2.0-15.0	5.1-7.3	---
	34-48	---		---	---	---
	48	---		---	---	---
265C:						
Garne-----	0-10	1-8		2.0-10.0	5.1-7.3	---
	10-23	1-8		2.0-10.0	5.1-7.3	---
	23-27	1-8		1.0-7.0	5.1-7.3	---
	27-34	8-18		2.0-15.0	5.1-7.3	---
	34-48	---		---	---	---
	48	---		---	---	---
303A:						
Boguscreek-----	0-9	8-18		7.0-30.0	5.6-7.8	---
	9-50	8-18		4.0-25.0	5.6-7.8	---
	50-57	8-18		2.0-15.0	5.6-7.3	---
	57-80	1-4		0.0-4.0	5.1-6.5	---
313D2:						
Plumcreek-----	0-4	10-25		10.0-35.0	5.1-7.3	---
	4-7	10-20		2.0-20.0	5.1-7.3	---
	7-28	18-27		4.0-25.0	5.1-7.3	---
	28-36	8-25		2.0-20.0	5.1-7.3	---
	36-60	8-30		2.0-20.0	5.1-8.4	0-20

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct	
313F:						
Plumcreek-----	0-4	10-25	10.0-35.0	5.1-7.3	---	
	4-7	10-20	2.0-20.0	5.1-7.3	---	
	7-28	18-27	4.0-25.0	5.1-7.3	---	
	28-36	8-25	2.0-20.0	5.1-7.3	---	
	36-60	8-30	2.0-20.0	5.1-8.4	0-20	
316B2:						
Ella-----	0-8	10-25	6.0-25.0	5.1-7.3	---	
	8-55	18-30	4.0-25.0	5.1-7.3	---	
	55-72	10-30	2.0-15.0	5.1-7.3	---	
	72-80	10-30	2.0-15.0	5.1-8.4	0-15	
316C2:						
Ella-----	0-8	10-25	6.0-25.0	5.1-7.3	---	
	8-55	18-30	4.0-25.0	5.1-7.3	---	
	55-72	10-30	2.0-15.0	5.1-7.3	---	
	72-80	10-30	2.0-15.0	5.1-8.4	0-15	
318A:						
Bearpen-----	0-8	10-25	6.0-30.0	5.1-7.3	---	
	8-18	12-22	4.0-25.0	5.1-7.3	---	
	18-41	18-30	4.0-25.0	5.1-7.3	---	
	41-50	10-30	2.0-20.0	5.1-7.3	---	
	50-60	10-18	2.0-15.0	5.1-7.8	---	
326B2:						
Medary-----	0-7	15-27	5.0-25.0	5.1-7.3	---	
	7-14	15-40	6.0-35.0	5.1-6.5	---	
	14-30	35-60	7.0-50.0	5.1-6.5	---	
	30-60	25-60	5.0-50.0	5.1-7.8	0-15	
403A:						
Dakota-----	0-10	12-22	7.0-30.0	5.1-7.3	---	
	10-13	12-22	7.0-30.0	5.1-7.3	---	
	13-35	18-30	5.0-30.0	5.1-7.3	---	
	35-38	4-11	1.0-10.0	5.1-7.3	---	
	38-60	1-4	0.0-4.0	5.1-6.5	0-15	
413A:						
Rasset-----	0-18	6-15	5.0-15.0	5.1-7.3	---	
	18-30	10-18	7.0-13.0	5.1-7.3	---	
	30-42	2-10	2.0-7.0	5.1-7.3	---	
	42-60	1-5	1.0-3.0	5.1-7.8	---	
413B:						
Rasset-----	0-18	6-15	5.0-15.0	5.1-7.3	---	
	18-30	10-18	7.0-13.0	5.1-7.3	---	
	30-42	2-10	2.0-7.0	5.1-7.3	---	
	42-60	1-5	1.0-3.0	5.1-7.8	---	
423A:						
Meridian-----	0-9	8-20	6.0-20.0	5.1-7.3	---	
	9-28	18-30	5.0-20.0	5.1-7.3	---	
	28-32	15-25	5.0-20.0	5.1-6.5	---	
	32-72	1-4	1.0-6.0	5.1-6.5	---	
423B2:						
Meridian-----	0-9	8-20	6.0-20.0	5.1-7.3	---	
	9-28	18-30	5.0-20.0	5.1-7.3	---	
	28-32	15-25	5.0-20.0	5.1-6.5	---	
	32-72	1-4	1.0-6.0	5.1-6.5	---	

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct		meq/100g	pH	Pct
429A:						
Lows-----	0-6	12-22		10.0-25.0	5.1-6.5	---
	6-13	10-22		5.0-12.0	5.1-6.5	---
	13-28	18-27		9.0-15.0	5.1-6.5	---
	28-60	2-8		1.0-6.0	5.1-6.5	---
432A:						
Kevilar-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-29	6-18		2.0-15.0	5.1-7.3	---
	29-50	1-6		0.0-7.0	5.1-7.3	---
	50-80	8-18		2.0-15.0	5.1-7.3	---
432B:						
Kevilar-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-29	6-18		2.0-15.0	5.1-7.3	---
	29-50	1-6		0.0-7.0	5.1-7.3	---
	50-80	8-18		2.0-15.0	5.1-7.3	---
432C2:						
Kevilar-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-29	6-18		2.0-15.0	5.1-7.3	---
	29-50	1-6		0.0-7.0	5.1-7.3	---
	50-80	8-18		2.0-15.0	5.1-7.3	---
433A:						
Forkhorn-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-25	6-18		2.0-15.0	5.1-7.3	---
	25-32	3-10		0.0-7.0	5.1-6.5	---
	32-46	2-8		0.0-7.0	5.1-6.5	---
	46-72	1-5		0.0-5.0	5.1-6.5	---
433B:						
Forkhorn-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-25	6-18		2.0-15.0	5.1-7.3	---
	25-32	3-10		0.0-7.0	5.1-6.5	---
	32-46	2-8		0.0-7.0	5.1-6.5	---
	46-72	1-5		0.0-5.0	5.1-6.5	---
433C2:						
Forkhorn-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-25	6-18		2.0-15.0	5.1-7.3	---
	25-32	3-10		0.0-7.0	5.1-6.5	---
	32-46	2-8		0.0-7.0	5.1-6.5	---
	46-72	1-5		0.0-5.0	5.1-6.5	---
436A:						
Rusktown-----	0-9	5-15		5.0-20.0	5.1-7.3	---
	9-25	6-18		2.0-15.0	5.1-7.3	---
	25-38	3-10		1.0-9.0	5.1-6.5	---
	38-45	2-8		0.0-7.0	5.1-6.5	---
	45-72	1-5		0.0-5.0	5.1-6.5	---
438A:						
Hoopeston-----	0-13	8-18		9.0-17.0	5.1-6.5	---
	13-22	12-18		7.0-13.0	5.1-7.8	0-5
	22-72	2-10		1.0-7.0	5.1-7.8	0-20
453A:						
Burkhardt-----	0-10	5-13		5.0-15.0	5.1-6.5	---
	10-17	8-18		4.0-15.0	5.1-6.5	---
	17-60	1-6		0.0-6.0	5.6-6.5	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
453B: Burkhardt-----	0-10	5-13	5.0-15.0	5.1-6.5	---
	10-17	8-18	4.0-15.0	5.1-6.5	---
	17-60	1-6	0.0-6.0	5.6-6.5	---
501A: Finchford-----	0-10	5-10	10.0-15.0	5.1-7.3	---
	10-19	5-10	10.0-15.0	5.1-7.3	---
	19-26	2-8	5.0-10.0	5.1-7.3	---
	26-80	2-5	5.0-10.0	5.1-7.3	---
501B: Finchford-----	0-10	5-10	10.0-15.0	5.1-7.3	---
	10-19	5-10	10.0-15.0	5.1-7.3	---
	19-26	2-8	5.0-10.0	5.1-7.3	---
	26-80	2-5	5.0-10.0	5.1-7.3	---
502B2: Chelsea-----	0-9	3-8	5.0-10.0	5.1-7.3	---
	9-60	5-10	5.0-10.0	5.1-6.5	---
502C2: Chelsea-----	0-9	3-8	5.0-10.0	5.1-7.3	---
	9-60	5-10	5.0-10.0	5.1-6.5	---
506A: Komro-----	0-10	3-10	3.0-10.0	5.1-7.3	---
	10-18	2-8	1.0-10.0	5.1-7.3	---
	18-38	2-8	0.0-7.0	5.1-7.3	---
	38-72	1-5	0.0-5.0	5.1-6.5	---
508A: Farrington-----	0-9	3-10	3.0-15.0	5.1-7.3	---
	9-18	2-8	2.0-10.0	5.1-7.3	---
	18-41	2-8	1.0-7.0	5.1-7.3	---
	41-72	1-5	1.0-5.0	5.1-6.5	---
510B: Boplain-----	0-9	1-6	3.0-15.0	5.1-7.3	---
	9-32	1-10	0.0-10.0	5.1-7.3	---
	32-37	0-7	0.0-7.0	4.5-6.5	---
	37-60	---	---	---	---
510C: Boplain-----	0-9	1-6	3.0-15.0	5.1-7.3	---
	9-32	1-10	0.0-10.0	5.1-7.3	---
	32-37	0-7	0.0-7.0	4.5-6.5	---
	37-60	---	---	---	---
510F: Boplain-----	0-9	1-6	3.0-15.0	5.1-7.3	---
	9-32	1-10	0.0-10.0	5.1-7.3	---
	32-37	0-7	0.0-7.0	4.5-6.5	---
	37-60	---	---	---	---
511A: Plainfield-----	0-4	2-5	1.0-8.0	5.1-7.3	---
	4-32	1-7	0.0-7.0	5.1-6.5	---
	32-80	0-4	0.0-1.0	5.1-6.5	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
511B:					
Plainfield-----	0-4	2-5	1.0-8.0	5.1-7.3	---
	4-32	1-7	0.0-7.0	5.1-6.5	---
	32-80	0-4	0.0-1.0	5.1-6.5	---
511C:					
Plainfield-----	0-4	2-5	1.0-8.0	5.1-7.3	---
	4-32	1-7	0.0-7.0	5.1-6.5	---
	32-80	0-4	0.0-1.0	5.1-6.5	---
511F:					
Plainfield-----	0-4	2-5	1.0-8.0	5.1-7.3	---
	4-32	1-7	0.0-7.0	5.1-6.5	---
	32-80	0-4	0.0-1.0	5.1-6.5	---
512B:					
Drammen-----	0-9	1-8	2.0-10.0	5.1-7.3	---
	9-44	1-8	1.0-8.0	5.1-7.3	---
	44-65	1-10	0.0-7.0	5.1-6.5	---
	65-72	0-5	0.0-1.0	5.1-6.5	---
512C:					
Drammen-----	0-9	1-8	2.0-10.0	5.1-7.3	---
	9-44	1-8	1.0-8.0	5.1-7.3	---
	44-65	1-10	0.0-7.0	5.1-6.5	---
	65-72	0-5	0.0-1.0	5.1-6.5	---
512D:					
Drammen-----	0-9	1-8	2.0-10.0	5.1-7.3	---
	9-44	1-8	1.0-8.0	5.1-7.3	---
	44-65	1-10	0.0-7.0	5.1-6.5	---
	65-72	0-5	0.0-1.0	5.1-6.5	---
516A:					
Aldo-----	0-7	2-5	3.0-6.0	5.1-7.3	---
	7-42	2-7	4.0-6.0	5.1-7.3	---
	42-80	1-4	2.0-5.0	5.1-6.5	---
546A:					
Prissel-----	0-9	1-6	5.0-20.0	5.1-7.3	---
	9-48	1-6	2.0-15.0	5.1-7.3	---
	48-56	8-18	2.0-15.0	5.1-6.5	---
	56-72	1-6	0.0-7.0	5.1-6.5	---
546B:					
Prissel-----	0-9	1-6	5.0-20.0	5.1-7.3	---
	9-48	1-6	2.0-15.0	5.1-7.3	---
	48-56	8-18	2.0-15.0	5.1-6.5	---
	56-72	1-6	0.0-7.0	5.1-6.5	---
546F:					
Prissel-----	0-9	1-6	5.0-20.0	5.1-7.3	---
	9-48	1-6	2.0-15.0	5.1-7.3	---
	48-56	8-18	2.0-15.0	5.1-6.5	---
	56-72	1-6	0.0-7.0	5.1-6.5	---
561B:					
Tarr-----	0-6	3-5	2.0-8.0	4.5-6.5	---
	6-34	3-8	1.0-7.0	4.5-6.5	---
	34-62	3-8	1.0-7.0	4.5-6.5	---

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct		meq/100g	pH	Pct
566A:						
Tint-----	0-9	4-8		2.0-10.0	4.5-6.5	---
	9-34	0-5		0.0-5.0	4.5-6.5	---
	34-60	0-5		0.0-5.0	4.5-6.5	---
589A:						
Newson-----	0-8	2-10		20.0-50.0	3.5-6.5	---
	8-25	1-4		1.0-7.0	4.5-6.5	---
	25-64	1-4		0.0-4.0	5.1-6.5	---
616B:						
Chaseburg-----	0-4	12-16		7.0-20.0	5.6-7.3	---
	4-60	10-18		10.0-35.0	5.6-7.3	---
626A:						
Arenzville-----	0-25	10-18		7.0-20.0	5.6-7.3	---
	25-40	10-30		10.0-35.0	5.6-7.3	---
	40-60	10-20		5.0-15.0	5.6-7.3	---
628A:						
Orion-----	0-8	10-18		7.0-20.0	5.6-7.3	---
	8-32	10-18		7.0-20.0	5.6-7.3	---
	32-40	10-30		10.0-35.0	5.6-7.3	---
	40-60	10-18		5.0-15.0	5.6-7.3	---
629A:						
Ettrick-----	0-16	15-27		10.0-45.0	5.6-7.3	---
	16-35	20-35		4.0-30.0	6.1-8.4	---
	35-60	8-27		2.0-25.0	6.1-8.4	---
646A:						
Dunnbot-----	0-9	8-18		8.0-21.0	5.6-7.3	---
	9-36	8-18		8.0-21.0	5.6-7.3	---
	36-45	8-18		7.0-15.0	5.6-7.3	---
	45-72	1-6		1.0-5.0	5.6-7.3	---
656A:						
Scotah-----	0-4	2-15		3.0-15.0	5.6-7.3	---
	4-22	0-10		4.0-8.0	5.6-7.3	---
	22-60	0-10		1.0-2.0	5.6-7.8	---
826B2:						
Hersey-----	0-8	10-20		6.0-20.0	5.1-7.3	---
	8-36	18-27		4.0-25.0	5.1-7.3	---
	36-58	12-27		3.0-25.0	5.1-6.5	---
	58-115	12-30		2.0-25.0	5.1-7.3	---
826C2:						
Hersey-----	0-8	10-20		6.0-20.0	5.1-7.3	---
	8-36	18-27		4.0-25.0	5.1-7.3	---
	36-58	12-27		3.0-25.0	5.1-6.5	---
	58-115	12-30		2.0-25.0	5.1-7.3	---
1135F:						
Dorerton-----	0-3	10-18		7.0-13.0	5.1-7.3	---
	3-10	5-15		7.0-13.0	5.1-7.3	---
	10-18	18-35		10.0-20.0	5.1-7.3	---
	18-30	20-35		10.0-19.0	5.6-7.3	1-10
	30-60	2-25		1.0-14.0	7.4-8.4	1-15

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth		Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct		meq/100g	pH	Pct
1135F:						
Elbaville-----	0-4	10-27	9.0-25.0	5.1-7.3	---	
	4-16	10-20	9.0-25.0	5.1-7.3	---	
	16-20	18-35	13.0-26.0	5.1-7.3	---	
	20-25	35-50	25.0-36.0	5.1-7.3	---	
	25-36	20-35	10.0-26.0	6.6-7.8	0-5	
	36-60	5-18	3.0-10.0	6.6-7.8	0-10	
1145F:						
Gaphill-----	0-5	8-15	10.0-30.0	4.5-7.3	---	
	5-11	5-12	1.0-10.0	5.6-7.3	---	
	11-32	8-17	2.0-15.0	5.6-7.3	---	
	32-50	2-8	0.0-7.0	5.6-7.3	---	
	50-56	1-6	0.0-6.0	5.6-7.3	---	
	56-72	---	---	---	---	
Rockbluff-----	0-4	2-6	8.0-20.0	4.5-7.3	---	
	4-9	1-5	0.0-6.0	5.1-7.3	---	
	9-35	1-5	0.0-5.0	5.1-7.3	---	
	35-52	0-3	0.0-3.0	5.1-7.3	---	
	52-60	---	---	---	---	
1155F:						
Brodale-----	0-6	5-18	7.0-19.0	6.6-8.4	0-20	
	6-50	5-18	3.0-11.0	7.4-8.4	40-60	
	50	---	---	---	---	
Bellechester----	0-16	1-3	2.0-6.0	6.1-8.4	---	
	16-42	2-8	1.0-6.0	6.6-8.4	0-5	
	42	---	---	---	---	
Rock outcrop.						
1224F:						
Boone-----	0-3	2-3	0.0-4.0	4.5-6.5	---	
	3-8	1-5	0.0-6.0	4.5-6.5	---	
	8-35	0-3	0.0-3.0	4.5-6.5	---	
	35-60	---	---	---	---	
Elevasil-----	0-3	8-13	4.0-15.0	4.5-6.5	---	
	3-27	10-17	2.0-15.0	4.5-6.5	---	
	27-31	2-10	0.0-9.0	4.5-6.5	---	
	31-39	1-8	0.0-7.0	4.5-6.5	---	
	39-60	---	---	---	---	
1648A:						
Northbend-----	0-7	10-14	10.0-45.0	3.5-6.5	---	
	7-34	5-17	8.0-40.0	3.5-6.5	---	
	34-36	4-8	1.0-8.0	4.5-7.3	---	
	36-60	2-5	1.0-4.0	4.5-7.3	---	
Ettrick-----	0-16	15-27	10.0-45.0	6.1-7.8	---	
	16-35	20-35	4.0-30.0	6.1-8.4	---	
	35-60	8-27	2.0-25.0	6.1-8.4	---	
1658A:						
Alganssee-----	0-4	5-15	6.0-15.0	5.6-7.3	---	
	4-31	0-15	1.0-4.0	5.6-7.3	---	
	31-60	0-10	1.0-4.0	5.6-7.8	---	
Kalmarville-----	0-6	13-23	11.0-24.0	5.6-7.8	---	
	6-42	8-18	6.0-15.0	5.6-7.8	---	
	42-60	2-5	1.0-5.0	5.6-7.8	---	

Chemical Properties of the Soils--Continued

Map symbol and soil name	Depth	Clay	Cation- exchange capacity	Soil reaction	Calcium carbonate
	In	Pct	meq/100g	pH	Pct
2003A: Riverwash-----	0-60	0-3	---	5.1-6.5	---
2013: Pits, gravel----	0-60	0-2	---	---	---
2014: Pits, quarry----	0-60	---	---	---	---
2040: Udipsamments----	0-60	1-15	---	5.1-6.5	---
2050: Landfill.					

Water 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	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
11A: Markey-----	D	Frequent---	Long-----	Mar-Jun	+1.0-1.0	Apparent---	Oct-Jun
20A: Palms-----	A/D	None-----	---	---	+1.0-1.0	Apparent---	Oct-Jun
Houghton-----	A/D	None-----	---	---	+2.0-0.5	Apparent---	Oct-Jun
21A: Palms-----	D	Frequent---	Long-----	Mar-Jun	+1.0-1.0	Apparent---	Oct-Jun
40A: Markey-----	A/D	None-----	---	---	+1.0-1.0	Apparent---	Oct-Jun
Seelyeville----	A/D	None-----	---	---	+2.0-0.5	Apparent---	Oct-Jun
114B2: Mt. Carroll----	B	None-----	---	---	>6.0	---	---
114C2: Mt. Carroll----	B	None-----	---	---	>6.0	---	---
115B2: Seaton-----	B	None-----	---	---	>6.0	---	---
115C2: Seaton-----	B	None-----	---	---	>6.0	---	---
115D2: Seaton-----	B	None-----	---	---	>6.0	---	---
116C2: Churchtown----	B	None-----	---	---	>6.0	---	---
116D2: Churchtown----	B	None-----	---	---	>6.0	---	---
116E: Churchtown----	B	None-----	---	---	>6.0	---	---
125B2: Pepin-----	B	None-----	---	---	>6.0	---	---
125C2: Pepin-----	B	None-----	---	---	>6.0	---	---
125D2: Pepin-----	B	None-----	---	---	>6.0	---	---
125E2: Pepin-----	B	None-----	---	---	>6.0	---	---
144B2: NewGlarus-----	B	None-----	---	---	>6.0	---	---
144C2: NewGlarus-----	B	None-----	---	---	>6.0	---	---
144D2: NewGlarus-----	B	None-----	---	---	>6.0	---	---

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
144E: NewGlarus-----	B	None-----	---	---	>6.0	---	---
213C2: Hixton-----	B	None-----	---	---	>6.0	---	---
213D2: Hixton-----	B	None-----	---	---	>6.0	---	---
213E2: Hixton-----	B	None-----	---	---	>6.0	---	---
224B: Elevasil-----	B	None-----	---	---	>6.0	---	---
224C2: Elevasil-----	B	None-----	---	---	>6.0	---	---
224D2: Elevasil-----	B	None-----	---	---	>6.0	---	---
233C: Boone-----	A	None-----	---	---	>6.0	---	---
254B2: Norden-----	B	None-----	---	---	>6.0	---	---
254C2: Norden-----	B	None-----	---	---	>6.0	---	---
254D2: Norden-----	B	None-----	---	---	>6.0	---	---
254E2: Norden-----	B	None-----	---	---	>6.0	---	---
254F: Norden-----	B	None-----	---	---	>6.0	---	---
255B2: Urne-----	B	None-----	---	---	>6.0	---	---
255C2: Urne-----	B	None-----	---	---	>6.0	---	---
255D2: Urne-----	B	None-----	---	---	>6.0	---	---
255E: Urne-----	B	None-----	---	---	>6.0	---	---
255F: Urne-----	B	None-----	---	---	>6.0	---	---
265B: Garne-----	B	None-----	---	---	>6.0	---	---
265C: Garne-----	B	None-----	---	---	>6.0	---	---
303A: Boguscreek-----	B	Occasional	Very brief	Mar-Jul	>6.0	---	---

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
313D2: Plumcreek-----	B	None-----	---	---	>6.0	---	---
313F: Plumcreek-----	B	None-----	---	---	>6.0	---	---
316B2: Ella-----	B	None-----	---	---	3.5-6.0	Perched----	Oct-Jun
316C2: Ella-----	B	None-----	---	---	3.5-6.0	Perched----	Oct-Jun
318A: Bearpen-----	C	Rare-----	---	---	1.0-2.5	Perched----	Oct-Jun
326B2: Medary-----	C	None-----	---	---	2.5-3.5	Perched----	Mar-Jul
403A: Dakota-----	B	None-----	---	---	>6.0	---	---
413A: Rasset-----	B	None-----	---	---	>6.0	---	---
413B: Rasset-----	B	None-----	---	---	>6.0	---	---
423A: Meridian-----	B	None-----	---	---	>6.0	---	---
423B2: Meridian-----	B	None-----	---	---	>6.0	---	---
429A: Lows-----	B/D	Occasional	Brief-----	Oct-Jun	+1.0-1.0	Apparent----	Oct-Jun
432A: Kevilar-----	B	None-----	---	---	3.5-6.0	Perched----	Oct-Jun
432B: Kevilar-----	B	None-----	---	---	3.5-6.0	Perched----	Oct-Jun
432C2: Kevilar-----	B	None-----	---	---	3.5-6.0	Perched----	Oct-Jun
433A: Forkhorn-----	B	None-----	---	---	>6.0	---	---
433B: Forkhorn-----	B	None-----	---	---	>6.0	---	---
433C2: Forkhorn-----	B	None-----	---	---	>6.0	---	---
436A: Rusktown-----	B	None-----	---	---	3.5-6.0	Apparent----	Oct-Jun
438A: Hoopeston-----	B	None-----	---	---	1.0-2.5	Apparent----	Oct-Jun
453A: Burkhardt-----	B	None-----	---	---	>6.0	---	---

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
453B: Burkhardt-----	B	None-----	---	---	>6.0	---	---
501A: Finchford-----	A	None-----	---	---	>6.0	---	---
501B: Finchford-----	A	None-----	---	---	>6.0	---	---
502B2: Chelsea-----	A	None-----	---	---	>6.0	---	---
502C2: Chelsea-----	A	None-----	---	---	>6.0	---	---
506A: Komro-----	A	None-----	---	---	3.5-6.0	Apparent---	Oct-Jun
508A: Farrington-----	B	None-----	---	---	1.0-2.5	Apparent---	Oct-Jun
510B: Boplain-----	A	None-----	---	---	>6.0	---	---
510C: Boplain-----	A	None-----	---	---	>6.0	---	---
510F: Boplain-----	A	None-----	---	---	>6.0	---	---
511A: Plainfield-----	A	None-----	---	---	>6.0	---	---
511B: Plainfield-----	A	None-----	---	---	>6.0	---	---
511C: Plainfield-----	A	None-----	---	---	>6.0	---	---
511F: Plainfield-----	A	None-----	---	---	>6.0	---	---
512B: Drammen-----	A	None-----	---	---	>6.0	---	---
512C: Drammen-----	A	None-----	---	---	>6.0	---	---
512D: Drammen-----	A	None-----	---	---	>6.0	---	---
516A: Aldo-----	A	None-----	---	---	3.5-6.0	Apparent---	Oct-Jun
546A: Prissel-----	A	None-----	---	---	3.5-6.0	Perched---	Oct-Jun
546B: Prissel-----	A	None-----	---	---	3.5-6.0	Perched---	Oct-Jun
546F: Prissel-----	A	None-----	---	---	3.5-6.0	Perched---	Oct-Jun

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
561B: Tarr-----	A	None-----	---	---	>6.0	---	---
566A: Tint-----	A	None-----	---	---	3.5-6.0	Apparent---	Oct-Jun
589A: Newson-----	A/D	None-----	---	---	+1.0-1.0	Apparent---	Oct-Jun
616B: Chaseburg-----	B	Occasional	---	Mar-Jul	>6.0	---	---
626A: Arenzville-----	B	Occasional	Brief-----	Mar-Jul	3.5-6.0	Apparent---	Oct-Jun
628A: Orion-----	C	Occasional	Brief-----	Mar-Jul	1.0-2.5	Apparent---	Oct-Jun
629A: Ettrick-----	B/D	Frequent---	Long-----	Mar-Jul	+1.0-1.0	Apparent---	Oct-Jun
646A: Dunnbot-----	B	Occasional	Brief-----	Mar-Jun	3.5-6.0	Apparent---	Mar-Jun
656A: Scotah-----	A	Occasional	Brief-----	Mar-Jun	3.5-6.0	Apparent---	Mar-Jun
826B2: Hersey-----	B	None-----	---	---	3.5-6.0	Perched----	Mar-Jul
826C2: Hersey-----	B	None-----	---	---	3.5-6.0	Perched----	Mar-Jul
1135F: Dorerton-----	B	None-----	---	---	>6.0	---	---
Elbaville-----	B	None-----	---	---	>6.0	---	---
1145F: Gaphill-----	B	None-----	---	---	>6.0	---	---
Rockbluff-----	A	None-----	---	---	>6.0	---	---
1155F: Brodale-----	C	None-----	---	---	>6.0	---	---
Bellechester----	A	None-----	---	---	>6.0	---	---
Rock outcrop----	D	None-----	---	---	>6.0	---	---
1224F: Boone-----	A	None-----	---	---	>6.0	---	---
Elevasil-----	B	None-----	---	---	>6.0	---	---
1648A: Northbend-----	C	Frequent---	Brief-----	Mar-Jul	1.0-2.0	Apparent---	Oct-Jun
Ettrick-----	D	Frequent---	Long-----	Mar-Jul	+1.0-1.0	Apparent---	Oct-Jun

Water Features--Continued

Map symbol and soil name	Hydro- logic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth Ft	Kind of water table	Months
1658A:							
Alganssee-----	B	Frequent---	Long-----	Mar-Jun	1.0-2.5	Apparent---	Oct-Jun
Kalmarville----	D	Frequent---	Long-----	Mar-Jun	0.0-1.0	Apparent---	Oct-Jun
2003A:							
Riverwash-----	A	Frequent---	Long-----	Mar-Jul	1.0-6.0	Apparent---	Jan-Dec
2013:							
Pits, gravel----	A	None-----	---	---	>6.0	---	---
2014:							
Pits, quarry----	C	None-----	---	---	>6.0	---	---
2040:							
Udipsamments----	A	None-----	---	---	>6.0	---	---
2050:							
Landfill.							

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	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
11A: Markey-----	>60	---	8-25	25-50	High-----	High-----	Moderate.
20A: Palms-----	>60	---	8-25	25-50	High-----	High-----	Moderate.
Houghton-----	>60	---	25-30	40-60	High-----	High-----	Moderate.
21A: Palms-----	>60	---	8-25	25-50	High-----	High-----	Moderate.
40A: Markey-----	>60	---	8-25	25-50	High-----	High-----	Moderate.
Seelyeville-----	>60	---	25-30	40-60	High-----	High-----	Moderate.
114B2: Mt. Carroll-----	>60	---	---	---	High-----	Moderate----	Moderate.
114C2: Mt. Carroll-----	>60	---	---	---	High-----	Moderate----	Moderate.
115B2: Seaton-----	>60	---	---	---	High-----	Moderate----	Moderate.
115C2: Seaton-----	>60	---	---	---	High-----	Moderate----	Moderate.
115D2: Seaton-----	>60	---	---	---	High-----	Moderate----	Moderate.
116C2: Churchtown-----	>60	---	---	---	High-----	Moderate----	Moderate.
116D2: Churchtown-----	>60	---	---	---	High-----	Moderate----	Moderate.
116E: Churchtown-----	>60	---	---	---	High-----	Moderate----	Moderate.
125B2: Pepin-----	45-80	Hard	---	---	High-----	Moderate----	Moderate.
125C2: Pepin-----	45-80	Hard	---	---	High-----	Moderate----	Moderate.
125D2: Pepin-----	45-80	Hard	---	---	High-----	Moderate----	Moderate.
125E2: Pepin-----	45-80	Hard	---	---	High-----	Moderate----	Moderate.
144B2: NewGlarus-----	20-40	Hard	---	---	High-----	Moderate----	Moderate.
144C2: NewGlarus-----	20-40	Hard	---	---	High-----	Moderate----	Moderate.
144D2: NewGlarus-----	20-40	Hard	---	---	High-----	Moderate----	Moderate.

Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
144E: NewGlarus-----	20-40	Hard	---	---	High-----	Moderate----	Moderate.
213C2: Hixton-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
213D2: Hixton-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
213E2: Hixton-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
224B: Elevasil-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
224C2: Elevasil-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
224D2: Elevasil-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
233C: Boone-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
254B2: Norden-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
254C2: Norden-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
254D2: Norden-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
254E2: Norden-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
254F: Norden-----	20-40	Soft	---	---	High-----	Low-----	Moderate.
255B2: Urne-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
255C2: Urne-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
255D2: Urne-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
255E: Urne-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
255F: Urne-----	20-40	Soft	---	---	Moderate----	Low-----	Moderate.
265B: Garne-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
265C: Garne-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
303A: Boguscreek-----	>80	---	---	---	High-----	Moderate----	Low.

Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
313D2: Plumcreek-----	>60	---	---	---	High-----	Moderate----	Moderate.
313F: Plumcreek-----	>60	---	---	---	High-----	Moderate----	Moderate.
316B2: Ella-----	>80	---	---	---	High-----	High-----	Moderate.
316C2: Ella-----	>80	---	---	---	High-----	High-----	Moderate.
318A: Bearpen-----	>60	---	---	---	High-----	High-----	Moderate.
326B2: Medary-----	>60	---	---	---	High-----	High-----	Moderate.
403A: Dakota-----	>60	---	---	---	High-----	Low-----	Moderate.
413A: Rasset-----	>60	---	---	---	Moderate----	Low-----	Moderate.
413B: Rasset-----	>60	---	---	---	Moderate----	Low-----	Moderate.
423A: Meridian-----	>60	---	---	---	High-----	Low-----	Moderate.
423B2: Meridian-----	>60	---	---	---	High-----	Low-----	Moderate.
429A: Lows-----	>60	---	---	---	High-----	High-----	Moderate.
432A: Kevilar-----	>80	---	---	---	Moderate----	Moderate----	Moderate.
432B: Kevilar-----	>80	---	---	---	Moderate----	Moderate----	Moderate.
432C2: Kevilar-----	>80	---	---	---	Moderate----	Moderate----	Moderate.
433A: Forkhorn-----	>60	---	---	---	Moderate----	Low-----	Moderate.
433B: Forkhorn-----	>60	---	---	---	Moderate----	Low-----	Moderate.
433C2: Forkhorn-----	>60	---	---	---	Moderate----	Low-----	Moderate.
436A: Rusktown-----	>80	---	---	---	Moderate----	Moderate----	Moderate.
438A: Hoopston-----	>60	---	---	---	High-----	Moderate----	Moderate.
453A: Burkhardt-----	>60	---	---	---	Low-----	Low-----	Moderate.

Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
453B: Burkhardt-----	>60	---	---	---	Low-----	Low-----	Moderate.
501A: Finchford-----	>80	---	---	---	Low-----	Low-----	Moderate.
501B: Finchford-----	>80	---	---	---	Low-----	Low-----	Moderate.
502B2: Chelsea-----	>60	---	---	---	Low-----	Low-----	Moderate.
502C2: Chelsea-----	>60	---	---	---	Low-----	Low-----	Moderate.
506A: Komro-----	>60	---	---	---	Low-----	Low-----	Moderate.
508A: Farrington-----	>60	---	---	---	Moderate---	Low-----	Moderate.
510B: Boplain-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
510C: Boplain-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
510F: Boplain-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
511A: Plainfield-----	>60	---	---	---	Low-----	Low-----	Moderate.
511B: Plainfield-----	>60	---	---	---	Low-----	Low-----	Moderate.
511C: Plainfield-----	>60	---	---	---	Low-----	Low-----	Moderate.
511F: Plainfield-----	>60	---	---	---	Low-----	Low-----	Moderate.
512B: Drammen-----	>80	---	---	---	Low-----	Low-----	Moderate.
512C: Drammen-----	>80	---	---	---	Low-----	Low-----	Moderate.
512D: Drammen-----	>80	---	---	---	Low-----	Low-----	Moderate.
516A: Aldo-----	>80	---	---	---	Low-----	Low-----	Moderate.
546A: Prissel-----	>80	---	---	---	Low-----	Moderate---	Moderate.
546B: Prissel-----	>80	---	---	---	Low-----	Moderate---	Moderate.
546F: Prissel-----	>80	---	---	---	Low-----	Moderate---	Moderate.

Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
561B: Tarr-----	>60	---	---	---	Low-----	Low-----	High.
566A: Tint-----	>60	---	---	---	Low-----	Low-----	High.
589A: Newson-----	>60	---	---	---	Moderate---	High-----	High.
616B: Chaseburg-----	>60	---	---	---	High-----	Moderate---	Moderate.
626A: Arenzville-----	>60	---	---	---	High-----	Moderate---	High.
628A: Orion-----	>60	---	---	---	High-----	High-----	Low.
629A: Ettrick-----	>60	---	---	---	High-----	High-----	Low.
646A: Dunnbot-----	>80	---	---	---	Moderate---	Moderate---	Low.
656A: Scotah-----	>60	---	---	---	Low-----	Low-----	Low.
826B2: Hersey-----	>80	---	---	---	High-----	Moderate---	High.
826C2: Hersey-----	>80	---	---	---	High-----	Moderate---	High.
1135F: Dorerton-----	>60	---	---	---	Moderate---	Low-----	Moderate.
Elbaville-----	>60	---	---	---	Moderate---	Moderate---	Moderate.
1145F: Gaphill-----	40-80	Soft	---	---	Moderate---	Low-----	Moderate.
Rockbluff-----	40-80	Soft	---	---	Low-----	Low-----	Moderate.
1155F: Brodale-----	40-80	Hard	---	---	Moderate---	Low-----	Low.
Bellechester---	40-70	Soft	---	---	Low-----	Low-----	Moderate.
Rock outcrop---	0-4	Hard	---	---	Low-----	Moderate---	Moderate.
1224F: Boone-----	20-40	Soft	---	---	Low-----	Low-----	Moderate.
Elevasil-----	20-40	Soft	---	---	Moderate---	Low-----	Moderate.
1648A: Northbend-----	>60	---	---	---	High-----	Moderate---	Moderate.
Ettrick-----	>60	---	---	---	High-----	High-----	Low.
1658A: Algansee-----	>60	---	---	---	Moderate---	Low-----	Low.
Kalmarville-----	>60	---	---	---	High-----	High-----	Low.

Soil Features--Continued

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
2003A: Riverwash-----	>60	---	---	---	Moderate----	Moderate----	Low.
2013: Pits, gravel----	>60	---	---	---	Low-----	Moderate----	Low.
2014: Pits, quarry----	0-4	Hard	---	---	Low-----	Moderate----	Moderate.
2040: Udipsamments----	>60	---	---	---	Low-----	Moderate----	Moderate.
2050: Landfill-----							

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Glossary

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

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

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

Alpha,alpha-dipyridyl. A dye that when dissolved in 1N ammonium acetate is used to detect the presence of reduced iron (Fe II) in the soil. A positive reaction indicates a type of redoximorphic feature.

Animal unit month (AUM). The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Aquic conditions. Current soil wetness characterized by saturation, reduction, and redoximorphic features.

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

Argillic horizon. A subsoil horizon characterized by an accumulation of illuvial clay.

Aspect. The direction in which a slope faces.

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

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

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

Backslope. The position that forms the steepest and generally linear, middle portion of a hillslope. In profile, backslopes are commonly bounded by a convex shoulder above and a concave footslope below.

Basal till. Compact glacial till deposited beneath the ice.

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

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

Bedrock-controlled topography. A landscape where the configuration and relief of the landforms are determined or strongly influenced by the underlying bedrock.

Blowout. A shallow depression from which all or most of the soil material has been removed by the wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Blowout (map symbol). A small saucer, cup, or trough-shaped hollow or depression formed by wind erosion on a preexisting sand deposit. The areas are typically less than 3 acres in size.

Borrow pit (map symbol). An open excavation from which soil and underlying material have been removed, usually for construction purposes. The areas are typically less than 3 acres in size.

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

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

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

Canopy. The leafy crown of trees or shrubs. (See Crown.)

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

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

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

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

Channery soil material. Soil material that has, by volume, 15 to 35 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches (15 centimeters) along the longest axis. A single piece is called a channer.

Chemical treatment. Control of unwanted vegetation through the use of chemicals.

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

Clastic. Pertaining to rock or sediment composed mainly of fragments derived from preexisting rocks or minerals and moved from their place of origin. The term indicates sediment sources that are both within and outside the depositional basin.

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

Clay depletions. Low-chroma zones having a low content of iron, manganese, and clay because of the chemical reduction of iron and manganese and the removal of iron, manganese, and clay. A type of redoximorphic depletion.

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

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

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

Coarse textured soil. Sand or loamy sand.

Cobble (or cobblestone). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Cobbly soil material. Material that has 15 to 35 percent, by volume, rounded or partially rounded rock fragments 3 to 10 inches (7.6 to 25 centimeters) in diameter. Very cobbly soil material has 35 to 60 percent of these rock fragments, and extremely cobbly soil material has more than 60 percent.

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

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

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

Concretions. Cemented bodies with crude internal symmetry organized around a point, a line, or a plane. They typically take the form of concentric layers visible to the naked eye. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up concretions. If formed in place, concretions of iron oxide or manganese oxide are generally considered a type of redoximorphic concentration.

Conservation cropping system. Growing crops in combination with needed cultural and management practices. In a good conservation cropping system, the soil-improving crops and practices more than offset the effects of the soil-depleting crops and practices. Cropping systems are needed on all tilled soils. Soil-improving practices in a conservation cropping system include the use of rotations that contain grasses and legumes and the return of crop residue to the soil. Other practices include the use of green

manure crops of grasses and legumes, proper tillage, adequate fertilization, and weed and pest control.

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

Consistence, soil. Refers to the degree of cohesion and adhesion of soil material and its resistance to deformation when ruptured. Consistence includes resistance of soil material to rupture and to penetration; plasticity, toughness, and stickiness of puddled soil material; and the manner in which the soil material behaves when subject to compression. Terms describing consistence are defined in the “Soil Survey Manual.”

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

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

Corrosion. Soil-induced electrochemical or chemical action that dissolves or weakens concrete or uncoated steel.

Coulee. A dry or intermittent stream valley or wash, especially a long, steep-walled gorge representing a Pleistocene overflow channel that carried meltwater from an ice sheet.

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

Cropping system. Growing crops according to a planned system of rotation and management practices.

Crop residue management. Returning crop residue to the soil, which helps to maintain soil structure, organic matter content, and fertility and helps to control erosion.

Crown. The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI). The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Cut and fill (map symbol). An area where the original soil profile has been altered by the addition or removal of more than about a foot of soil material. The area is typically less than 3 acres in size.

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

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

Depth, soil. Generally, the thickness of the soil over bedrock. Very deep soils are more than 60 inches deep over bedrock; deep soils, 40 to 60 inches; moderately deep, 20 to 40 inches; shallow, 10 to 20 inches; and very shallow, less than 10 inches.

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

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

Dolomite (mineral). A common rock-forming rhombohedral carbonate mineral— $\text{CaMg}(\text{CO}_3)_2$.

Dolomite (rock). A carbonate sedimentary rock consisting chiefly (more than 50 percent by weight or by areal percentages under the microscope) of the mineral dolomite. Compare: dolostone.

Dolostone. A term proposed for the sedimentary rock dolomite in order to avoid confusion with the mineral of the same name. Compare: dolomite.

Drainage class (natural). Refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil. Seven classes of natural soil drainage are recognized—*excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained*. These classes are defined in the “Soil Survey Manual.”

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

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

Endosaturation. A type of saturation of the soil in which all horizons between the upper boundary of saturation and a depth of 2 meters are saturated.

Eolian deposits. Earthy parent material accumulated through wind action; commonly refers to sandy

material in dunes or to loess in blankets on the surface.

Episaturation. A type of saturation indicating a perched water table in a soil in which saturated layers are underlain by one or more unsaturated layers within 2 meters of the surface.

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

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

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

Escarpment. A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and resulting from erosion or faulting. Synonym: scarp.

Escarpment, bedrock (map symbol). A relatively continuous and steep slope or cliff produced by erosion or faulting, breaking the general continuity of more gently sloping land surfaces. Exposed material is hard or soft bedrock.

Escarpment, other than bedrock (map symbol). A relatively continuous and steep slope or cliff that is generally produced by erosion but can be produced by faulting, breaking the general continuity of more gently sloping land surfaces. Exposed nonbedrock material is nonsoil or very shallow, poorly developed soil.

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

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

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

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

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has

drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity*, *normal moisture capacity*, or *capillary capacity*.

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

Flaggy soil material. Material that has, by volume, 15 to 35 percent flagstones. Very flaggy soil material has 35 to 60 percent flagstones, and extremely flaggy soil material has more than 60 percent flagstones.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist 6 to 15 inches (15 to 38 centimeters) long.

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

Flood-plain step. An essentially flat, alluvial surface within a valley that is frequently covered by floodwater from the present stream; any approximately horizontal surface frequently modified by scour and/or deposition. May occur individually or as a series of steps.

Footslope. The position that forms the inner, gently inclined surface at the base of a hillslope. In profile, footslopes are commonly concave. A footslope is a transition zone between upslope sites of erosion and transport (shoulders and backslopes) and downslope sites of deposition (toeslopes).

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

Forest cover. All trees and other woody plants (underbrush) covering the ground in a forest.

Forest type. A stand of trees similar in composition and development because of given physical and biological factors by which it may be differentiated from other stands.

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

Geomorphology. The science that treats the general configuration of the earth's surface; specifically the study of the classification, description, nature, origin, and development of landforms and their relationships to underlying structures, and the history of geologic changes as recorded by these surface features. The term is especially applied to the genetic interpretation of landforms.

Glacial outwash. Gravel, sand, and silt, commonly stratified, deposited by glacial meltwater.

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

Glaciofluvial deposits. Material moved by glaciers and subsequently sorted and deposited by

streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

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

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

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

Gravelly soil material. Material that has 15 to 35 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

Gravelly spot (map symbol). An area of soil in which the surface layer has more than 35 percent, by volume, rock fragments that are mostly less than 3 inches in diameter. The area is typically less than 3 acres in size.

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

Ground moraine. An extensive, fairly even layer of till having an uneven or undulating surface; a deposit of rock and mineral debris dragged along, in, on, or beneath a glacier and emplaced by processes including basal lodgment and release from downwasting stagnant ice by ablation.

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

Gully (map symbol). A very small channel with steep sides cut by running water and through which water ordinarily runs only after a rain or an ice or snow melt. Generally is an obstacle to wheeled vehicles and is too deep to be obliterated by ordinary tillage.

Hard bedrock. Bedrock that cannot be excavated except by blasting or by the use of special equipment that is not commonly used in construction.

Head slope. A geomorphic component of hills consisting of a laterally concave area of a hillside, especially at the head of a drainageway. The overland waterflow is converging.

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

Hill. A natural elevation of the land surface, rising as

much as 1,000 feet above surrounding lowlands, commonly of limited summit area and having a well defined outline; hillsides generally have slopes of more than 15 percent. The distinction between a hill and a mountain is arbitrary and is dependent on local usage.

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

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

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

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

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

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

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

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

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

Hydrologic soil groups. Refers to soils grouped according to their runoff potential. The soil properties that influence this potential are those

that affect the minimum rate of water infiltration on a bare soil during periods after prolonged wetting when the soil is not frozen. These properties are depth to a seasonal high water table, the infiltration rate and permeability after prolonged wetting, and depth to a very slowly permeable layer. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff.

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

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

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

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

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

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

Interfluve. An elevated area between two drainageways that sheds water to those drainageways.

Intermittent stream. A stream, or reach of a stream, that flows for prolonged periods only when it receives ground-water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Iron concentrations. High-chroma zones having a high content of iron and manganese oxide because of chemical oxidation and accumulation, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic concentration.

Iron depletions. Low-chroma zones having a low content of iron and manganese oxide because of chemical reduction and removal, but having a clay content similar to that of the adjacent matrix. A type of redoximorphic depletion.

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

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

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

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

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

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

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

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

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

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

Island (map symbol). Any island within a body of water and above the normal water level. The island should be a relatively permanent feature. The areas are typically less than 3 acres in size.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

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

Landfill (map symbol). An area of accumulated waste products of human habitation. Can be above or below natural ground level. The area is typically less than 3 acres in size.

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

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

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

Levee (map symbol). An embankment built to confine or control water, especially one built along the banks of a river to prevent overflow onto lowlands.

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

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

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

Low-chroma zones. Zones having chroma of 2 or less. Typical color in areas of iron depletions.

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

Masses. Concentrations of substances in the soil matrix that do not have a clearly defined boundary with the surrounding soil material and cannot be removed as a discrete unit. Common compounds making up masses are calcium carbonate, gypsum or other soluble salts, iron oxide, and manganese oxide. Masses consisting of iron oxide or manganese oxide generally are considered a type of redoximorphic concentration.

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

Mine or quarry (map symbol). An open excavation from which soil and underlying material are removed, exposing the bedrock. Also used to denote surface openings to underground mines. The areas are typically less than 3 acres in size.

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

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

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

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

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

Mollic epipedon. A thick, dark, humus-rich surface horizon (or horizons) that has high base saturation and pedogenic soil structure. It may include the upper part of the subsoil.

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

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

Mottling, soil. Irregular spots of different colors that vary in number and size. Descriptive terms are as follows: abundance—*few*, *common*, and *many*; size—*fine*, *medium*, and *coarse*; and contrast—*faint*, *distinct*, and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

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

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

Natural levee. A long, broad, low ridge or embankment of sand and coarse silt, built up by a stream on its flood plain and along both sides of its channel. Consists of wedge-shaped deposits of the coarsest suspended-load material and slopes gently away from the stream.

Neutral soil. A soil having a pH value of 6.6 to 7.3. (See Reaction, soil.)

Nose slope. A geomorphic component of hills consisting of the projecting end (laterally convex area) of a hillside. The overland waterflow is predominantly divergent.

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

Organic matter. Plant and animal residue in the soil in various stages of decomposition. The content of organic matter in the surface layer is described as follows:

Very low	less than 0.5 percent
Low	0.5 to 1.0 percent
Moderately low	1.0 to 2.0 percent
Moderate	2.0 to 4.0 percent
High	4.0 to 8.0 percent
Very high	more than 8.0 percent

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

Paddock. A fenced area commonly used to confine livestock for grazing.

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

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

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

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

Pedimentation. A thin layer of alluvial material that mantles an erosion surface and has been transported to its present position from higher lying areas of the erosion surface.

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

Percolation. The movement of water through the soil.

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

Perennial water (map symbol). Small natural or manmade lake, pond, or pit that contains water most of the year. The areas are typically less than 3 acres in size.

Permeability. The quality of the soil that enables water or air to move downward through the profile. The rate at which a saturated soil transmits water is accepted as a measure of this quality. In soil physics, the rate is referred to as “saturated hydraulic conductivity,” which is defined in the “Soil Survey Manual.” In line with conventional usage in the engineering profession and with traditional usage in published soil surveys, this rate of flow continues to be expressed as “permeability.” Terms describing permeability, measured in inches per hour, are as follows:

Extremely slow	0.0 to 0.01 inch
Very slow	0.01 to 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches

Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

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

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

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

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

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

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

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

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

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

Potential rooting depth (effective rooting depth). Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prairie. A fire-maintained natural community dominated by grasses and with few or no trees.

Prescribed burning. Deliberately burning an area for specific management purposes, under the appropriate conditions of weather and soil moisture and at the proper time of day.

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

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

Proper grazing use. Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This practice increases the vigor and reproduction capacity of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

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

Ultra acid	less than 3.5
Extremely acid	3.5 to 4.4
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Slightly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Redoximorphic concentrations. Nodules, concretions, soft masses, pore linings, and other features resulting from the accumulation of iron or manganese oxide. An indication of chemical reduction and oxidation resulting from saturation.

Redoximorphic depletions. Low-chroma zones from which iron and manganese oxide or a combination of iron and manganese oxide and clay has been removed. These zones are indications of the chemical reduction of iron resulting from saturation.

Redoximorphic features. Redoximorphic concentrations, redoximorphic depletions, reduced matrices, a positive reaction to alpha,alpha-dipyridyl, and other features indicating the chemical reduction and oxidation of iron and manganese compounds resulting from saturation.

Reduced matrix. A soil matrix that has low chroma in situ because of chemically reduced iron (Fe II). The chemical reduction results from nearly continuous wetness. The matrix undergoes a change in hue or chroma within 30 minutes after exposure to air as the iron is oxidized (Fe III). A type of redoximorphic feature.

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

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

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

Rill. A steep-sided channel resulting from accelerated erosion. A rill generally is a few inches deep and

not wide enough to be an obstacle to farm machinery.

Riser. The vertical or steeply sloping surface, commonly one of a series, of natural steplike landforms, as those of a glacial stairway or of successive stream terraces.

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

Rock outcrop (map symbol). An exposure of bedrock at the surface of the earth. Not used where the named soils of the surrounding map unit are shallow over bedrock. The areas are typically less than 3 acres in size.

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

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

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

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

Sand sheet. A large, irregularly shaped, commonly thin surficial mantle of eolian sand that lacks the discernible slip faces that are common on dunes.

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sandy spot (map symbol). An area of soil in which the surface layer contains more than 75 percent sand and where the named soils of the surrounding map unit have less than about 25 percent sand. The area is typically less than 3 acres in size.

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

Saturation. Wetness characterized by zero or positive pressure of the soil water. Under conditions of saturation, the water will flow from the soil matrix into an unlined auger hole.

Savanna. A fire-maintained natural community dominated by grasses or sedges but with scattered fire-tolerant species of trees. Hazelnut is a major shrub.

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

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

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

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

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

Short steep slope (map symbol). A narrow area that has slopes at least two slope classes steeper than the slope class of the surrounding map unit. The area is typically less than 3 acres in size.

Shoulder. The position that forms the uppermost inclined surface near the top of a hillslope. It is a transition from backslope to summit. The surface is dominantly convex in profile and erosional in origin.

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

Shrub-carrs. Plant communities composed of tall, deciduous shrubs growing on saturated or seasonally flooded soils. They are usually dominated by willow and/or redosier dogwood and, in some places, silky dogwood. Shrub-carrs typically retain some of the forbs, grasses, and sedges of the inland fresh meadows. It should be noted that several alien shrub species are invading shrub-carrs, especially where disturbances, such as drainage and grazing, have occurred.

Side slope. A geomorphic component of hills consisting of a laterally planar area of a hillside. The overland waterflow is predominantly parallel.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

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

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

Sinkhole (map symbol). A closed depression formed either by solution of the surficial rock or by collapse of underlying caves. Complexes of sinkholes in carbonate-rock terrain are the main components of karst topography. The areas are typically less than 3 acres in size.

Slackwater. A quiet part of a body of water or a still body of water in a stream.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

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

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

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

Soft bedrock. Bedrock that can be excavated with trenching machines, backhoes, small rippers, and other equipment commonly used in construction.

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

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

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

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of

the material below the solum. The living roots and plant and animal activities are largely confined to the solum.

Spoil area (map symbol). Piles of earthy materials, either smoothed or uneven, resulting from human activity. The areas are typically less than 3 acres in size.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 15 to 24 inches (38 to 60 centimeters) in length if flat.

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

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind erosion and water erosion.

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

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

Substratum. The part of the soil below the solum.

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

Summit. The topographically highest position of a hillslope. It has a nearly level (planar or only slightly convex) surface.

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

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

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior. Soils are recognized as taxadjuncts only when one or more of their characteristics are slightly outside the range defined for the family of the series for which the soils are named.

Terminal moraine. A belt of thick glacial drift that

generally marks the termination of important glacial advances.

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

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

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

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

Till. Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Till plain. An extensive area of nearly level to undulating soils underlain by glacial till.

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

Toeslope. The position that forms the gently inclined surface at the base of a hillslope. Toeslopes in profile are commonly gentle and linear and are constructional surfaces forming the lower part of a hillslope continuum that grades to valley or closed-depression floors.

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

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

Tread. The flat or gently sloping surface of natural steplike landforms, commonly one of a series, such as successive stream terraces.

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

Valley train. A long narrow body of outwash confined

within a valley beyond a glacier; it may or may not emerge from the valley and join an outwash plain.

Very stony spot (map symbol). An area in which more than 3 percent of the surface is covered with rock fragments larger than 10 inches in diameter. The area is typically less than 3 acres in size.

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

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

bearing properties by compaction. Contrasts with poorly graded soil.

Wet spot (map symbol). An area of somewhat poorly drained to very poorly drained soils at least two drainage classes wetter than the named soils in the surrounding map unit. The area is typically less than 3 acres in size.

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

Windthrow. The uprooting and tipping over of trees by the wind.

