United States
Department of
Agriculture

Natural
Resources
Conservation
Service

In cooperation with
Minnesota Agricultural
Experiment Station

Soil Survey of Becker County, Minnesota

Part II

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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**, which is the color map preceding the detailed soil maps, 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 unit 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** follow the general soil map. These 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**, which precedes the soil maps. 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 **Index to Map Units** in Part I of this survey, which lists the map units by symbol and name and shows the page where each map unit is described.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for 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 November 1992. Soil names and descriptions were approved in February 1994. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1993. This survey was made cooperatively by the Natural Resources Conservation Service and the Minnesota Agricultural Experiment Station. Assistance was provided by the Agricultural Extension Service, the Minnesota Department of Natural Resources, and the Soil and Water Conservation Board. The survey was partially funded by the Legislative Commission for Minnesota Resources and by Becker County. It is part of the technical assistance furnished to the Becker County Soil and Water Conservation District.

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

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Cover: An area of Formdale-Langhei-Flom soils.

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Summary of Tables

Part I

Part II

(Page numbers are in the Summary of Tables in Part II)

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Soil Survey of Becker County, Minnesota

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 survey 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
Aazdahl	Aquic Haploborolls, fine-loamy, mixed
Abbeylake	Typic Udipsamments, mixed, frigid
Arvilla	Udic Haploborolls, sandy, mixed
Audubon	Vertic Haploborolls, fine, montmorillonitic
Auganaush	Mollic Albaqualfs, fine, montmorillonitic, frigid
Balmlake	Typic Eutroboralfs, coarse-loamy, mixed
Barnes	Udic Haploborolls, fine-loamy, mixed
Beltrami	Aquic Eutroboralfs, fine-loamy, mixed
Birchlake	Aquic Argiborolls, fine, montmorillonitic
Blowers	Glossaquic Eutroboralfs, coarse-loamy, mixed
Bootlake	Typic Eutroboralfs, coarse-loamy, mixed
Boyerlake	Vertic Eutrochrepts, fine, montmorillonitic, frigid
Buse	Typic Calciborolls, fine-loamy, mixed
Bygland	Aquertic Argiborolls, fine, montmorillonitic
Cathro	Terric Borosaprists, loamy, mixed, euic
Chapett	Boralfic Udic Argiborolls, fine-loamy, mixed
Colvin	Typic Calciaquolls, fine-silty, frigid
Corliss	Typic Udipsamments, mixed, frigid
Dalbo	Vertic Eutroboralfs, fine, montmorillonitic
Darnen	Pachic Udic Haploborolls, fine-loamy, mixed
Dorset	Udic Argiborolls, coarse-loamy, mixed
Dovray	Cumulic Vertic Epiaquolls, fine, montmorillonitic, frigid
Eagleview	Argic Udipsamments, mixed, frigid
Egeland	Udic Haploborolls, coarse-loamy, mixed
Egglake	Mollic Endoaqualfs, fine-loamy, mixed, frigid
Epoufette	Mollic Endoaqualfs, coarse-loamy, mixed, frigid
Flom	Typic Endoaquolls, fine-loamy, mixed, frigid
Forada	Typic Endoaquolls, coarse-loamy, mixed, frigid
Fordville	Pachic Udic Haploborolls, fine-loamy over sandy or sandy-skeletal, mixed
Forman	Udic Argiborolls, fine-loamy, mixed
Formdale	Udic Haploborolls, fine-loamy, mixed
Foxlake	Vertic Epiaquolls, fine, montmorillonitic, frigid
Friendship	Typic Udipsamments, mixed, frigid
Gonvick	Aquic Argiborolls, fine-loamy, mixed
Graycalm	Argic Udipsamments, mixed, frigid
Hamerly	Aeric Calciaquolls, fine-loamy, frigid
Hamre	Histic Humaquepts, fine-loamy, mixed, nonacid, frigid
Hangaard	Typic Endoaquolls, sandy, mixed, frigid
Haslie	Limnic Borosaprists, coprogenous, euic
Hillview	Mollic Endoaqualfs, coarse-loamy, mixed, frigid
Karlstad	Aquic Eutroboralfs, coarse-loamy, mixed
Lakepark	Cumulic Endoaquolls, fine-loamy, mixed, frigid
Lamoure	Cumulic Endoaquolls, fine-silty, mixed (calcareous), frigid
Langhei	Typic Eutrochrepts, fine-loamy, mixed, frigid
Lida	Mollic Eutroboralfs, coarse-loamy, mixed
Lindaas	Typic Argiaquolls, fine, montmorillonitic, frigid
Lupton	Typic Borosaprists, euic
McIntosh	Aeric Calciaquolls, fine-silty, frigid
Meehan	Aquic Udipsamments, mixed, frigid
Menahga	Typic Udipsamments, mixed, frigid
Mooselake	Typic Borohemists, euic
Naytahwaush	Mollic Eutroboralfs, fine, montmorillonitic
Nebish	Typic Eutroboralfs, fine-loamy, mixed
Nidaros	Terric Borosaprists, loamy, mixed, euic
Nymore	Typic Udipsamments, mixed, frigid
Osakis	Aquic Haploborolls, sandy, mixed
Oylen	Aquic Argiborolls, coarse-loamy, mixed
Paddock	Udollic Epiaqualfs, coarse-loamy, mixed, frigid
Quam	Cumulic Endoaquolls, fine-silty, mixed, frigid
Rifle	Typic Borohemists, euic
Rockwell	Typic Calciaquolls, coarse-loamy, frigid
Rockwood	Mollic Eutroboralfs, coarse-loamy, mixed
Rosy	Glossaquic Eutroboralfs, coarse-loamy, mixed
Runeberg	Typic Endoaquolls, coarse-loamy, mixed, frigid
Rushlake	Aquic Udipsamments, mixed, frigid

CLASSIFICATION OF THE SOILS--Continued

Soil name	Family or higher taxonomic class
Sandberg	Udorthentic Haploborolls, sandy, mixed
Sedgeville	Fluvaquentic Endoaquolls, coarse-loamy, mixed, frigid
Seelyeville	Typic Borosaprists, euic
Smiley	Typic Argiaquolls, fine-loamy, mixed, frigid
Snellman	Typic Eutroboralfs, fine-loamy, mixed
Sol	Glossic Eutroboralfs, fine-loamy, mixed
Sugarbush	Typic Eutroboralfs, coarse-loamy, mixed
Sverdrup	Udic Haploborolls, sandy, mixed
Sybil	Mollic Eutroboralfs, sandy, mixed
Two Inlets	Psammentic Eutroboralfs, sandy, mixed
Udipsamments	Udipsamments
Udorthents	Udorthents
Urness	Mollic Fluvaquents, fine-silty, mixed (calcareous), frigid
Vallers	Typic Calciaquolls, fine-loamy, frigid
Verndale	Udic Argiborolls, coarse-loamy, mixed
Waukon	Mollic Eutroboralfs, fine-loamy, mixed
Winger	Typic Calciaquolls, fine-silty, frigid
Wolverton	Aquic Calciborolls, coarse-loamy, mixed
Wykeham	Aquic Eutroboralfs, fine-loamy, mixed
Wyndmere	Aeric Calciaquolls, coarse-loamy, frigid

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
20B	Chapett fine sandy loam, 2 to 8 percent slopes	1,730	0.2
20C2	Chapett fine sandy loam, 8 to 15 percent slopes, eroded	1,880	0.2
20E	Chapett fine sandy loam, 15 to 30 percent slopes	680	*
26	Aazdahl clay loam	3,110	0.3
33B	Barnes loam, 2 to 6 percent slopes	1,740	0.2
36	Flom silty clay loam	5,620	0.6
38B	Waukon loam, 2 to 8 percent slopes	6,730	0.7
38C	Waukon loam, 8 to 15 percent slopes	5,710	0.6
38E	Waukon loam, 15 to 30 percent slopes	2,300	0.3
40B	Nebish loam, 2 to 8 percent slopes	8,280	0.9
40C	Nebish loam, 8 to 15 percent slopes	9,650	1.0
40E	Nebish loam, 15 to 30 percent slopes	3,470	0.4
47	Colvin silty clay loam	940	0.1
63	Rockwell loam	2,390	0.2
108	McIntosh silt loam	3,820	0.4
111	Hangaard sandy loam	1,090	0.1
121	Wykeham fine sandy loam	3,820	0.4
125	Beltrami loam	4,380	0.5
133A	Dalbo silt loam, 0 to 2 percent slopes	3,620	0.4
133B	Dalbo silt loam, 2 to 8 percent slopes	3,280	0.4
133C	Dalbo silt loam, 8 to 15 percent slopes	1,330	0.2
133E	Dalbo silt loam, 15 to 30 percent slopes	280	*
137	Dovray silty clay	800	*
141B	Egeland fine sandy loam, 1 to 6 percent slopes	980	0.1
141C	Egeland fine sandy loam, 6 to 12 percent slopes	310	*
168B	Forman clay loam, 2 to 6 percent slopes	2,770	0.3
168C2	Forman clay loam, 6 to 12 percent slopes, eroded	3,110	0.3
168D2	Forman clay loam, 12 to 20 percent slopes, eroded	1,310	0.2
168E	Forman clay loam, 20 to 30 percent slopes	250	*
171B	Formdale clay loam, 2 to 5 percent slopes	8,580	0.9
180	Gonvick loam	810	*
184	Hamerly loam	10,330	1.1
191	Epoufette sandy loam	3,070	0.3
202	Meehan loamy sand	1,140	0.1
207D	Nymore loamy sand, 12 to 20 percent slopes	690	*
267B	Snellman sandy loam, 2 to 8 percent slopes	13,680	1.5
267C	Snellman sandy loam, 8 to 15 percent slopes	28,960	3.1
267E	Snellman sandy loam, 15 to 30 percent slopes	11,280	1.2
315A	Bootlake sandy loam, 0 to 2 percent slopes	370	*
315B	Bootlake sandy loam, 2 to 5 percent slopes	640	*
332B	Sugarbush sandy loam, 1 to 8 percent slopes	1,820	0.2
335	Urness mucky silt loam	3,760	0.4
339	Fordville loam	1,480	0.2
344	Quam silty clay loam	3,730	0.4
351	Colvin silty clay loam, depressional	1,090	0.1
375	Forada loam	3,360	0.4
398	Winger silty clay loam, depressional	2,380	0.2
406A	Dorset sandy loam, 0 to 2 percent slopes	3,610	0.4
406B	Dorset sandy loam, 2 to 6 percent slopes	8,730	0.9
413	Osakis sandy loam	560	*
418	Lamoure silty clay loam, occasionally flooded	1,510	0.2
422B	Bygland silty clay loam, 1 to 6 percent slopes	1,420	0.2
422C	Bygland silty clay loam, 6 to 15 percent slopes	290	*
503B	Balmlake fine sandy loam, 1 to 8 percent slopes	1,770	0.2
503C	Balmlake fine sandy loam, 8 to 15 percent slopes	700	*
503E	Balmlake fine sandy loam, 15 to 30 percent slopes	400	*
508	Wyndmere fine sandy loam	980	0.1
540	Seelyeville muck	15,580	1.7
541	Rifle mucky peat	51,540	5.6
544	Cathro muck	14,730	1.6
564	Friendship loamy sand	2,610	0.3
567A	Verndale sandy loam, 0 to 2 percent slopes	11,750	1.3
567B	Verndale sandy loam, 2 to 6 percent slopes	5,050	0.5

See footnote at end of table.

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
579C2	Formdale-Langhei-Sandberg complex, 6 to 12 percent slopes, eroded	920	*
624	Rosy sandy loam	850	*
701	Runeberg mucky loam, depressional	2,400	0.2
711B	Arvilla-Sandberg complex, 2 to 6 percent slopes	5,960	0.6
711C	Arvilla-Sandberg complex, 6 to 12 percent slopes	8,200	0.9
718B	Naytahwaush loam, 2 to 8 percent slopes	820	*
718C	Naytahwaush loam, 8 to 15 percent slopes	1,110	0.1
718E	Naytahwaush loam, 15 to 30 percent slopes	460	*
721E	Corliss loamy sand, 20 to 35 percent slopes	690	*
746	Haslie muck	16,410	1.8
747B	Audubon silty clay loam, 0 to 6 percent slopes	3,860	0.4
753D	Abbeylake loamy sand, 12 to 20 percent slopes	900	*
753E	Abbeylake loamy sand, 20 to 30 percent slopes	910	*
765	Smiley loam	3,640	0.4
767	Auganaush loam	110	*
775B	Sugarbush-Two Inlets complex, 1 to 8 percent slopes	18,850	2.0
775C	Sugarbush-Two Inlets complex, 8 to 15 percent slopes	20,990	2.3
776B	Snellman-Sugarbush complex, 2 to 8 percent slopes	18,810	2.0
776C	Snellman-Sugarbush complex, 8 to 15 percent slopes	35,090	3.8
776E	Snellman-Sugarbush complex, 15 to 30 percent slopes	18,250	2.0
778B	Dorset-Corliss complex, 1 to 6 percent slopes	6,640	0.7
778C	Dorset-Corliss complex, 6 to 12 percent slopes	4,880	0.5
780B	Audubon-Boyerlake complex, 1 to 6 percent slopes	2,290	0.3
780C2	Audubon-Boyerlake complex, 6 to 12 percent slopes, eroded	3,220	0.3
780D2	Audubon-Boyerlake complex, 12 to 20 percent slopes, eroded	1,010	0.1
785	Hamerly-Winger complex	13,640	1.5
786	Winger-Hamerly-Colvin complex	11,370	1.2
797	Mooselake and Lupton soils	7,200	0.8
867B	Graycalm-Menahga complex, 1 to 8 percent slopes	3,210	0.3
867C	Graycalm-Menahga complex, 8 to 15 percent slopes	2,720	0.3
867E	Graycalm-Menahga complex, 15 to 30 percent slopes	1,840	0.2
903B	Barnes-Langhei complex, 2 to 6 percent slopes	6,840	0.7
903C2	Barnes-Langhei complex, 6 to 12 percent slopes, eroded	4,010	0.4
931C2	Formdale-Langhei complex, 6 to 12 percent slopes, eroded	17,010	1.8
942D2	Langhei-Barnes complex, 12 to 20 percent slopes, eroded	1,320	0.1
943D2	Langhei-Formdale complex, 12 to 20 percent slopes, eroded	4,560	0.5
943E	Langhei-Formdale complex, 20 to 30 percent slopes	690	*
951B	Nebish-Sugarbush complex, 2 to 8 percent slopes	3,020	0.3
951C	Nebish-Sugarbush complex, 8 to 15 percent slopes	2,790	0.3
951E	Nebish-Sugarbush complex, 15 to 30 percent slopes	820	*
1015	Udipsamments, cut and fill land	990	0.1
1016	Udorthents, loamy, cut and fill land	330	*
1027	Udorthents, wet substratum, fill land	410	*
1030	Pits, gravel-Udipsamments complex	1,430	0.2
1104B	Waukon-Dorset complex, 1 to 8 percent slopes	540	*
1104C	Waukon-Dorset complex, 8 to 15 percent slopes	990	0.1
1111	Nidaros muck, frequently flooded	1,110	0.1
1113	Haslie, Seelyeville, and Cathro soils, ponded	6,950	0.8
1125B	Sverdrup-Abbeylake complex, 1 to 6 percent slopes	1,300	0.2
1125C	Sverdrup-Abbeylake complex, 6 to 12 percent slopes	380	*
1126B	Verndale-Nymore complex, 1 to 6 percent slopes	4,190	0.4
1127A	Bootlake-Graycalm complex, 0 to 2 percent slopes	3,830	0.4
1127B	Bootlake-Graycalm complex, 2 to 8 percent slopes	3,980	0.4
1128	Cathro muck, frequently flooded	1,360	0.2
1129	Lindaas silty clay loam, morainic	3,300	0.4
1130	Wolverton fine sandy loam	1,600	0.2
1131B	Verndale-Abbeylake complex, 1 to 6 percent slopes	3,580	0.4
1132B	Eagleview-Balmlake complex, 1 to 8 percent slopes	2,580	0.3
1132C	Eagleview-Balmlake complex, 8 to 15 percent slopes	1,620	0.2
1132E	Eagleview-Balmlake complex, 15 to 30 percent slopes	610	*
1135	Foxlake silty clay loam	2,140	0.2
1136	Nidaros muck	6,430	0.7
1137B	Birchlake silty clay loam, 1 to 6 percent slopes	3,500	0.4

See footnote at end of table.

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
1137C	Birchlake silty clay loam, 6 to 12 percent slopes, eroded	2,750	0.3
1137D	Birchlake silty clay loam, 12 to 20 percent slopes, eroded	1,230	0.1
1137E	Birchlake silty clay loam, 20 to 30 percent slopes	240	*
1138	Rushlake and Hangaard soils, lake beaches	3,460	0.4
1140B	Eagleview-Snellman complex, 1 to 8 percent slopes	2,470	0.3
1140C	Eagleview-Snellman complex, 8 to 15 percent slopes	1,510	0.2
1149	Hamerly clay loam	4,650	0.5
1195B	Sybil-Eagleview complex, 2 to 8 percent slopes	220	*
1195C	Sybil-Eagleview complex, 8 to 15 percent slopes	260	*
1195E	Sybil-Eagleview complex, 15 to 30 percent slopes	110	*
1196B	Lida-Two Inlets complex, 1 to 8 percent slopes	340	*
1196C	Lida-Two Inlets complex, 8 to 15 percent slopes	920	*
1196E	Lida-Two Inlets complex, 15 to 30 percent slopes	550	*
1200	Egglake loam	4,290	0.5
1201C	Sugarbush-Snellman complex, 8 to 15 percent slopes	5,110	0.6
1201E	Sugarbush-Snellman complex, 15 to 35 percent slopes	4,880	0.5
1210	Paddock-Epoufette complex	1,600	0.2
1211	Egglake-Cathro complex	2,890	0.3
1225	Wykeham-Karlstad complex	900	*
1227	Quam, Cathro, and Urness soils, ponded	3,950	0.4
1230	Haslie and Nidaros soils, ponded	10,300	1.1
1234B	Formdale-Buse complex, 2 to 6 percent slopes	16,360	1.8
1235B	Formdale-Buse-Sandberg complex, 2 to 6 percent slopes	970	0.1
1236B	Eagleview loamy sand, 1 to 8 percent slopes	5,970	0.6
1236C	Eagleview loamy sand, 8 to 15 percent slopes	5,040	0.5
1236E	Eagleview loamy sand, 15 to 30 percent slopes	3,420	0.4
1238E	Two Inlets-Sugarbush complex, 15 to 30 percent slopes	12,080	1.3
1242D	Sandberg-Arvilla complex, 12 to 20 percent slopes	3,100	0.3
1243B	Sol sandy loam, 2 to 8 percent slopes, very stony	850	*
1243C	Sol sandy loam, 8 to 15 percent slopes, very stony	3,500	0.4
1243E	Sol sandy loam, 15 to 30 percent slopes, very stony	800	*
1244B	Sol-Sugarbush complex, 2 to 8 percent slopes, very stony	2,300	0.3
1244C	Sol-Sugarbush complex, 8 to 15 percent slopes, very stony	6,600	0.7
1244E	Sol-Sugarbush complex, 15 to 30 percent slopes, very stony	3,000	0.3
1246	Winger silty clay loam	7,720	0.8
1247D	Corliss-Dorset complex, 12 to 20 percent slopes	1,260	0.1
1248C	Nymore-Verndale complex, 6 to 12 percent slopes	1,730	0.2
1249C	Graycalm-Bootlake complex, 8 to 15 percent slopes	2,160	0.2
1250C	Abbeylake-Verndale complex, 6 to 12 percent slopes	3,580	0.4
1251	Lamoure silt loam, channeled, frequently flooded	890	*
1252B	Bootlake-Eagleview complex, 1 to 8 percent slopes	7,390	0.8
1263C	Eagleview-Bootlake complex, 8 to 15 percent slopes	4,020	0.4
1291	Sedgeville loam, frequently flooded	700	*
1306	Karlstad sandy loam	3,680	0.4
1317	Vallers silty clay loam	10,630	1.2
1318	Darnen loam	380	*
1319B	Rockwood sandy loam, 2 to 6 percent slopes, stony	6,750	0.7
1319C	Rockwood sandy loam, 6 to 12 percent slopes, stony	1,530	0.2
1319D	Rockwood sandy loam, 12 to 20 percent slopes, stony	160	*
1320B	Blowers sandy loam, 1 to 5 percent slopes, stony	15,130	1.6
1321	Paddock fine sandy loam, stony	7,390	0.8
1365	Hillview fine sandy loam	590	*
1825B	Seelyeville muck, seep land, 1 to 10 percent slopes	2,510	0.3
1878	Hamre muck	1,960	0.2
1938	Lakepark clay loam	4,060	0.4
1942	Forada mucky loam, depressional	1,190	0.1
1967	Hamerly-Vallers complex	14,210	1.5
1975	Oylen sandy loam	2,060	0.2
1997	Vallers-Hamerly-Winger complex	6,160	0.7
	Water	84,600	9.2
	Total	924,300	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, and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

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.

Crops and Pasture

By Lee R. Johnson, district conservationist, and David D. Breitbach, conservation agronomist, Natural Resources Conservation Service.

The main forms of agriculture in Becker County are cash crop farming and dairy farming. Becker County has approximately 295,000 acres of cropland and 80,500 acres of pastureland. In 1990, about 57,000 acres was used for corn, soybeans, and other row crops, such as potatoes, edible dry beans, and sunflowers. Approximately 123,000 acres was used for small grain, including wheat, barley, and oats. Approximately 130,000 acres was used for hay and pasture (USDA, 1990).

The soils in Becker County vary from the dark, fertile glacial till soils that formed under prairie vegetation in the northwestern part of the county to the light colored, sandy soils with very low fertility that formed under forest vegetation on the sandy outwash plains in eastern Becker County. Because of this variation, there are substantial differences in the crops grown in the eastern and western parts of the county. In recent years, irrigation of potatoes, dry edible beans, and corn has increased in eastern Becker County.

Erosion by wind or by water reduces soil productivity by removing nutrients and organic matter from the surface layer. As the thickness of the topsoil is reduced through erosion, part of the less fertile subsoil is incorporated into the plow layer. Erosion can be especially damaging on soils that are underlain by sand or gravel and that have a low water-holding capacity. Examples are Sandberg and Arvilla soils.

Wind erosion and water erosion result in the sedimentation of ditches, streams, and lakes. The sediments carry nutrients and pesticides. Sediments deposited in ditches interfere with drainage systems. Removing these sediments is expensive. Measures that control erosion and minimize the pollution of streams and lakes improve the quality of water for commercial or recreational uses and for fish and wildlife.

Wind erosion is a hazard on approximately 60 percent of the cropland in the county. The factors that influence the susceptibility to wind erosion are the texture of the surface layer, free carbonates at the surface, surface roughness, field size, and vegetative cover.

The most serious erosion occurs in northwestern Becker County where small grain and row crops are grown intensively. A lack of wind barriers makes the area very susceptible to wind erosion. The soils in this area that are most susceptible to wind erosion are Hamerly, Winger, Vallers, and McIntosh soils. These soils typically have a surface layer of clay loam or silty clay loam. In many of the soils, free carbonates at the surface adversely affect the stability of soil aggregates and thus increase the hazard of wind erosion. Management methods have little effect on soil texture or on the content of free calcium carbonates.

The Ponsford Prairie Sand Plain in eastern Becker County also has a high potential for wind erosion. Intensive farming under irrigation has greatly increased the hazard of wind erosion in this area. The present trend towards raising potatoes, dry edible beans, and corn under irrigation increases the wind erosion hazard. Dorset, Verndale, Nymore, Bootlake, and Graycalm soils are examples of soils that are susceptible to wind erosion on the Ponsford Prairie (fig. II-1).

Farmers should consider the factors of surface roughness, field size, and vegetative cover when methods of controlling wind erosion are designed. Surface roughness can be increased by certain types of tillage. Leaving moldboard-plowed fields rough and cloddy in the fall can reduce the hazard of erosion until

Figure II-1.—Dry edible beans in an irrigated area of Verndale-Nymore complex, 1 to 6 percent slopes. Center-pivot irrigation is used extensively on the droughty glacial outwash soils in eastern Becker County to provide a dependable source of water for various crops.

these conditions are destroyed by freezing and thawing. Using a chisel plow instead of a moldboard plow results in a more stable, better defined pattern of ridges and valleys and incorporates crop residue into the soil or leaves it on the surface.

Crop residue management is one of the most cost-effective methods of controlling wind erosion. Tillage practices that leave all or part of the crop residue on the surface are very effective during periods when the soil is highly susceptible to wind erosion. Conservation tillage systems that can be used in Becker County include reduced tillage (using chisel plows, field cultivators, and disks) and no-till systems for planting small grain, legumes, and corn.

The factors that should be considered when a system of conservation tillage is selected include soil texture, drainage, slope, and the crops to be grown. Tillage methods that leave a large amount of crop residue on the surface are most effective in areas of moderately well drained to excessively drained soils.

Water erosion is a concern on approximately 20 percent of the cropland in the county. It is a hazard in the gently sloping to very steep areas of Formdale, Barnes, Langhei, Forman, Birchlake, Waukon, Nebish, and Snellman soils. It is also a hazard in the longer sloping areas of Rockwood and Blowers soils in southeastern Becker County. Contour farming, terraces, diversions, and crop rotations that include grasses and legumes are effective in controlling sheet and rill erosion. In many areas, terraces, contour farming, and diversions are not practical because of the short, irregular slopes. In these areas, conservation tillage systems help to control sheet and rill erosion and grassed waterways combined with sediment-control structures help to control erosion caused by a concentrated flow.

Drainage is a major consideration affecting the management of crops and pasture. Managing drainage

in conformance with regulations influencing wetlands may require special permits and extra planning. Wetness is a problem on about 22 percent of the cropland in the county. Open ditches are commonly used to remove excess water on some soils, such as Flom, Colvin, Quam, and Vallers soils. Surface drainage is used mainly in northwestern Becker County (fig. II-2). The majority of drainage work now consists of cleaning and maintaining existing drainage ditches. Tiling or subsurface drainage is limited because of the lack of adequate outlets and the high cost of installation.

The inherent fertility of the soils varies tremendously from the western part of the county to the eastern part. The variation is the result of differences in parent materials and vegetation. Soils in the western part of Becker County formed under prairie vegetation and tend to be alkaline. Soils in the eastern part formed under forest vegetation and tend to be more acidic in the upper part of the soil profile. The prairie soils typically are low in phosphorus and high in potassium, and the forested soils typically are high in phosphorus and low in potassium and sulfur.

Applications of fertilizer increase crop yields in most areas of Becker County. The amount of fertilizer applied should be based on the results of soil tests. Applications vary greatly, depending on soil type, past management, and nutrient demands of the crop to be grown.

About 80,500 acres in the county is used as permanent pasture. Areas that are too wet, too steep, too rocky, or too droughty for cultivation commonly are used as permanent pasture. Existing pastures can be improved by using a pasture rotation system, applying fertilizer, controlling weeds, and deferring grazing during wet periods or until the grasses reach a proper height. In some areas, pastures can be renovated by reseeding to a more productive species. In fields where erosion is a serious hazard or in areas that are are too rocky to be tilled, no-till drills or other types of interseeding equipment can be used to reestablish hayland and pasture.

Cropland Management Considerations

The management concerns affecting the use of the detailed 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 rate of water infiltration. 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 tilth and compaction, and *restricted permeability.*—These limitations can be minimized by incorporating green manure crops, manure, or crop residue into the soil; applying a system of conservation tillage; and using conservation cropping systems. Also, crops may respond well to additions of phosphate fertilizer to soils that have a high content of lime.

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

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

Surface 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.* 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 the salinity of the soil.

Figure II-2.—A shallow drainage ditch in an area of Winger silty clay loam.

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.

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 organic matter content.—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 organic matter content.—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.

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

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 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 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 each map unit 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 are also 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, for stand survival, and for 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 rangeland, 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 numerals 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, 2e. 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 each map unit 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 as 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 249,410 acres, or nearly 27 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." This list does not constitute a recommendation for a particular land use. 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 in Part III. The soil qualities that affect use and management are described in the section "Soil Series and Detailed Soil Map Units."

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.

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. 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 gullying, 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 factor (I) 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.

Additional information about wind erodibility groups and K, Kf, 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

Dean Hendrickson, technician, Becker County Soil and Water Conservation District, helped prepare this section.

When the early settlers arrived in Becker County, approximately 25 percent of the land area was prairie. Windbreaks were essential for protecting farmsteads and livestock in the northwestern part of the county. Many of the older existing windbreaks were established in the 1920's and 1930's. The species planted in these older windbreaks were primarily elm, boxelder, and cottonwood.

The renovation of old, deteriorated farmstead windbreaks is a common conservation practice. Renovation consists of clearing and then replanting to new species. Field windbreaks have been established in northwestern Becker County and on the Ponsford Prairie. The soils in these areas are susceptible to wind erosion. The practice of creating larger fields and eliminating fence rows has necessitated the establishment of more field windbreaks.

Maximum growth, survival rates, and species adaptability vary dramatically in Becker County. The species selected for use in windbreaks should be

compatible with the type of soil, and measures that control competition from weeds are needed.

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.

Windbreak Suitability Groups

Windbreak suitability groups consist of soils in which the kinds and degrees of the hazards and limitations that affect the survival and growth of trees and shrubs in windbreaks are about the same.

Group 1 consists of soils that are somewhat poorly drained or moderately well drained, are rapidly permeable to moderately slowly permeable, and do not have free carbonates in the upper 20 inches.

Group 1K consists of soils that are somewhat poorly drained or moderately well drained, are rapidly permeable to moderately slowly permeable, and have free carbonates within 20 inches of the surface. These soils may be very slightly saline or slightly saline (the electrical conductivity is 2 to 8).

Group 2 consists of poorly drained soils that have been artificially drained and do not have free carbonates in the upper 20 inches. Permeability varies.

Group 2K consists of poorly drained or very poorly drained soils that have been artificially drained and have free carbonates within 20 inches of the surface. Permeability varies. These soils may be very slightly saline or slightly saline (the electrical conductivity is 2 to 8).

Group 2H consists of very poorly drained soils that have been artificially drained and have more than 16 inches of organic material. Permeability varies.

Group 2W consists of very poorly drained soils that are subject to ponding and have been artificially drained. It includes soils that have an organic surface layer up to 16 inches thick. Permeability varies.

Group 3 consists of soils that are well drained or moderately well drained and are loamy or silty throughout. Permeability is moderate or moderately slow. These soils do not have free carbonates in the upper 20 inches.

Group 4 consists of soils that are well drained, moderately well drained, or somewhat poorly drained and have a silty or loamy surface layer and a clayey subsoil. Permeability is slow or very slow.

Group 4C consists of soils that are well drained, moderately well drained, or somewhat poorly drained and have a clayey surface layer and subsoil. Permeability is slow or very slow.

Group 4F consists of soils that are well drained, moderately well drained, or somewhat poorly drained and have a substratum of dense till. Permeability is slow or very slow.

Group 5 consists of soils that are excessively drained to moderately well drained and have a moderate available water capacity. These soils are dominantly fine sandy loam or sandy loam, but some are sandy in the upper part and loamy in the lower part.

Group 6G consists of excessively drained to moderately well drained soils that are loamy in the upper part and have sand or sand and gravel at a depth of 20 to 40 inches. These soils have a low or moderate available water capacity.

Group 6D consists of excessively drained to moderately well drained, loamy soils that have bedrock at a depth of 20 to 40 inches. These soils have a low or

moderate available water capacity.

Group 7 consists of excessively drained to well drained soils that are dominantly loamy fine sand or coarser textured and are shallow to sand or to sand and gravel. These soils have a low available water capacity.

Group 8 consists of excessively drained to well drained, loamy soils that have free carbonates within 20 inches of the surface.

Group 9W consists of soils that are somewhat poorly drained, poorly drained, or very poorly drained and are moderately saline (the electrical conductivity is 8 to 16).

Group 10 consists of soils or miscellaneous land types that generally are not suitable for windbreaks. One or more characteristics, such as soil depth, texture, wetness, available water capacity, or slope, limit the planting, survival, or growth of trees and shrubs.

CROPLAND MANAGEMENT CONSIDERATIONS

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

Map symbol and soil name	Cropland management considerations
20B:	
Chapett	Potential for surface-water contamination Water erosion Wind erosion
20C2:	
Chapett	Potential for surface-water contamination Previously eroded Water erosion Wind erosion
20E:	
Chapett	Potential for surface-water contamination Slope Water erosion Wind erosion
26:	
Aazdahl	Potential for ground-water contamination Potential poor tilth and compaction
33B:	
Barnes	Potential for surface-water contamination Water erosion
36:	
Flom	Potential for ground-water contamination Potential poor tilth and compaction Water table
38B:	
Waukon	Potential for surface-water contamination Water erosion
38C:	
Waukon	Potential for surface-water contamination Water erosion
38E:	
Waukon	Potential for surface-water contamination Slope Water erosion
40B:	
Nebish	Limited organic matter content Potential for surface-water contamination Water erosion
40C:	
Nebish	Limited organic matter content Potential for surface-water contamination Water erosion
40E:	
Nebish	Limited organic matter content Potential for surface-water contamination Slope Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
47:	
Colvin	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion
63:	
Rockwell	Excessive permeability Lime content Potential for ground-water contamination Water table Wind erosion
108:	
Mcintosh	Lime content Potential for ground-water contamination Water table Wind erosion
111:	
Hangaard	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
121:	
Wykeham	Potential for ground-water contamination Wind erosion
125:	
Beltrami	Potential for ground-water contamination
133A:	
Dalbo	Potential for ground-water contamination
133B:	
Dalbo	Potential for ground-water contamination Potential for surface-water contamination Water erosion
133C:	
Dalbo	Potential for ground-water contamination Potential for surface-water contamination Water erosion
133E:	
Dalbo	Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion
137:	
Dovray	Ponding Potential for ground-water contamination Potential poor tilth and compaction
141B:	
Egeland	Potential for surface-water contamination Water erosion Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
141C:	
Egeland	Potential for surface-water contamination Water erosion Wind erosion
168B:	
Forman	Potential for surface-water contamination Potential poor tilth and compaction Water erosion
168C2:	
Forman	Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion
168D2:	
Forman	Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion
168E:	
Forman	Potential for surface-water contamination Potential poor tilth and compaction Slope Water erosion
171B:	
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Water erosion
180:	
Gonvick	Potential for ground-water contamination
184:	
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
191:	
Epoufette	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
202:	
Meehan	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
207D:	
Nymore	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
267B:	
Snellman	Potential for surface-water contamination Water erosion Wind erosion
267C:	
Snellman	Potential for surface-water contamination Water erosion Wind erosion
267E:	
Snellman	Potential for surface-water contamination Slope Water erosion Wind erosion
315A:	
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
315B:	
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
332B:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
335:	
Urness	High organic matter content Lime content Ponding Potential for ground-water contamination Wind erosion
339:	
Fordville	Excessive permeability Potential for ground-water contamination

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
344:	
Quam	Ponding Potential for ground-water contamination Potential poor tilth and compaction
351:	
Colvin	Lime content Ponding Potential for ground-water contamination Potential poor tilth and compaction Wind erosion
375:	
Forada	Excessive permeability Potential for ground-water contamination Water table
398:	
Winger	Lime content Ponding Potential for ground-water contamination Potential poor tilth and compaction Wind erosion
406A:	
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
406B:	
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
413:	
Osakis	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
418:	
Lamoure	Flooding Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
422B:	
Bygland	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion
422C:	
Bygland	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
503B:	
Balmlake	Potential for surface-water contamination Water erosion Wind erosion
503C:	
Balmlake	Potential for surface-water contamination Water erosion Wind erosion
503E:	
Balmlake	Potential for surface-water contamination Slope Water erosion Wind erosion
508:	
Wyndmere	Lime content Potential for ground-water contamination Water table Wind erosion
540:	
Seelyeville	High organic matter content Ponding Potential for ground-water contamination Wind erosion
541:	
Rifle	High organic matter content Ponding Potential for ground-water contamination
544:	
Cathro	High organic matter content Ponding Potential for ground-water contamination Wind erosion
564:	
Friendship	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
567A:	
Verndale	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
567B:	
Verndale	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
579C2:	
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
579C2:	
Langhei	Lime content Potential for surface-water contamination Potential poor tilth and compaction Water erosion Wind erosion
Sandberg	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
624:	
Rosy	Limited organic matter content Potential for ground-water contamination Wind erosion
701:	
Runeberg	Ponding Potential for ground-water contamination
711B:	
Arvilla	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Sandberg	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
711C:	
Arvilla	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Sandberg	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
718B:	
Naytahwaush	Potential for surface-water contamination Water erosion
718C:	
Naytahwaush	Potential for surface-water contamination Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
718E:	
Naytahwaush	Potential for surface-water contamination Slope Water erosion
721E:	
Corliss	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
746:	
Haslie	High organic matter content Ponding Potential for ground-water contamination Wind erosion
747B:	
Audubon	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion
753D:	
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
753E:	
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
765:	
Smiley	Potential for ground-water contamination Water table
767:	
Auganaush	Potential for ground-water contamination Water table
775B:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content 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
775B:	
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
775C:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
776B:	
Snellman	Potential for surface-water contamination Water erosion Wind erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
776C:	
Snellman	Potential for surface-water contamination Water erosion Wind erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
776E:	
Snellman	Potential for surface-water contamination Slope Water erosion Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
776E:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
778B:	
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Corliss	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
778C:	
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Corliss	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
780B:	
Audubon	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion
Boyerlake	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion
780C2:	
Audubon	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion
Boyerlake	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
780D2:	
Audubon	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion
Boyerlake	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion
785:	
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
Winger	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion
786:	
Winger	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
Colvin	Lime content Ponding Potential for ground-water contamination Potential poor tilth and compaction Wind erosion
797:	
Mooselake	High organic matter content Ponding Potential for ground-water contamination
Lupton	High organic matter content Potential for ground-water contamination Water table Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
867B:	
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Menahga	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
867C:	
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Menahga	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
867E:	
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Menahga	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
903B:	
Barnes	Potential for surface-water contamination Water erosion
Langhei	Lime content Potential for surface-water contamination Water erosion Wind erosion
903C2:	
Barnes	Potential for surface-water contamination Previously eroded Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
903C2:	
Langhei	Lime content Potential for surface-water contamination Previously eroded Water erosion Wind erosion
931C2:	
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion
Langhei	Lime content Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion Wind erosion
942D2:	
Langhei	Lime content Potential for surface-water contamination Previously eroded Slope Water erosion Wind erosion
Barnes	Potential for surface-water contamination Previously eroded Slope Water erosion
943D2:	
Langhei	Lime content Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion Wind erosion
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion
943E:	
Langhei	Lime content Potential for surface-water contamination Potential poor tilth and compaction Slope Water erosion Wind erosion
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Slope Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
951B:	
Nebish	Limited organic matter content Potential for surface-water contamination Water erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
951C:	
Nebish	Limited organic matter content Potential for surface-water contamination Water erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
951E:	
Nebish	Limited organic matter content Potential for surface-water contamination Slope Water erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1015:	
Udipsamments	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Wind erosion
1016:	
Udorthents	Limited available water capacity Slope Water erosion Wind erosion
1027:	
Udorthents	Potential for ground-water contamination
1030:	
Pits	Nonsoil material

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1030:	
Udipsamments	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Wind erosion
1104B:	
Waukon	Potential for surface-water contamination Water erosion
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1104C:	
Waukon	Potential for surface-water contamination Water erosion
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1111:	
Nidaros	Excessive permeability Flooding High organic matter content Ponding Potential for ground-water contamination Potential for surface-water contamination Wind erosion
1113:	
Haslie	High organic matter content Ponding Potential for ground-water contamination
Seelyeville	High organic matter content Ponding Potential for ground-water contamination
Cathro	High organic matter content Ponding Potential for ground-water contamination
1125B:	
Sverdrup	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1125C:	
Sverdrup	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1126B:	
Verndale	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Nymore	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
1127A:	
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Wind erosion
1127B:	
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
1128:	
Cathro	Flooding High organic matter content Ponding Potential for ground-water contamination Potential for surface-water contamination Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1129:	
Lindaas	Potential for ground-water contamination Potential poor tilth and compaction Water table
1130:	
Wolverton	Lime content Potential for ground-water contamination Wind erosion
1131B:	
Verndale	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
1132B:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Balmlake	Potential for surface-water contamination Water erosion Wind erosion
1132C:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Balmlake	Potential for surface-water contamination Water erosion Wind erosion
1132E:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Balmlake	Potential for surface-water contamination Slope Water erosion Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1135:	
Foxlake	Potential for ground-water contamination Potential poor tilth and compaction Water table
1136:	
Nidaros	Excessive permeability High organic matter content Ponding Potential for ground-water contamination Wind erosion
1137B:	
Birchlake	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water erosion
1137C:	
Birchlake	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Water erosion
1137D:	
Birchlake	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Previously eroded Slope Water erosion
1137E:	
Birchlake	Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Slope Water erosion
1138:	
Rushlake	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
Hangaard	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
1140B:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Snellman	Potential for surface-water contamination Water erosion Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1140C:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Snellman	Potential for surface-water contamination Water erosion Wind erosion
1149:	
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
1195B:	
Sybil	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Wind erosion
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
1195C:	
Sybil	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1195E:	
Sybil	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
1195E:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1196B:	
Lida	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1196C:	
Lida	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1196E:	
Lida	Excessive permeability Limited available water capacity Potential for ground-water contamination Slope Water erosion Wind erosion
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1200:	
Egglake	Potential for ground-water contamination Water table

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1201C:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Snellman	Potential for surface-water contamination Water erosion Wind erosion
1201E:	
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Snellman	Potential for surface-water contamination Slope Water erosion Wind erosion
1210:	
Paddock	Dense layer Limited available water capacity Potential for ground-water contamination Restricted permeability Water table Wind erosion
Epoufette	Excessive permeability Limited available water capacity Potential for ground-water contamination Water table Wind erosion
1211:	
Egglake	Potential for ground-water contamination Water table Wind erosion
Cathro	High organic matter content Ponding Potential for ground-water contamination Wind erosion
1225:	
Wykeham	Potential for ground-water contamination Wind erosion
Karlstad	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1227:	
Quam	Ponding Potential for ground-water contamination
Cathro	High organic matter content Ponding Potential for ground-water contamination
Urness	High organic matter content Lime content Ponding Potential for ground-water contamination Wind erosion
1230:	
Haslie	High organic matter content Ponding Potential for ground-water contamination
Nidaros	Excessive permeability High organic matter content Ponding Potential for ground-water contamination
1234B:	
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Water erosion
Buse	Lime content Potential for surface-water contamination Potential poor tilth and compaction Water erosion Wind erosion
1235B:	
Formdale	Potential for surface-water contamination Potential poor tilth and compaction Water erosion
Buse	Lime content Potential for surface-water contamination Water erosion Wind erosion
Sandberg	Excessive permeability Limited available water capacity Potential for ground-water contamination Water erosion Wind erosion
1236B:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1236C:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1236E:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1238E:	
Two Inlets	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1242D:	
Sandberg	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Arvilla	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1243B:	
Sol	Potential for surface-water contamination Surface stones Water erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1243C:	
Sol	Potential for surface-water contamination Surface stones Water erosion
1243E:	
Sol	Potential for surface-water contamination Slope Surface stones Water erosion
1244B:	
Sol	Potential for surface-water contamination Surface stones Water erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Surface stones Water erosion Wind erosion
1244C:	
Sol	Potential for surface-water contamination Surface stones Water erosion
Sugarbush	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Surface stones Water erosion Wind erosion
1244E:	
Sol	Potential for surface-water contamination Slope Surface stones Water erosion
Sugarbush	Excessive permeability Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Slope Surface stones Water erosion Wind erosion
1246:	
Winger	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1247D:	
Corliss	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
Dorset	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Slope Water erosion Wind erosion
1248C:	
Nymore	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Verndale	Excessive permeability Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1249C:	
Graycalm	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1250C:	
Abbeylake	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Verndale	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
1251:	
Lamoure	Channeled Flooding Lime content Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
1252B:	
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Wind erosion
1263C:	
Eagleview	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
Bootlake	Excessive permeability Limited available water capacity Limited organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Wind erosion
1291:	
Sedgeville	Excessive permeability Flooding Ponding Potential for ground-water contamination Potential for surface-water contamination
1306:	
Karlstad	Excessive permeability Limited available water capacity Potential for ground-water contamination Wind erosion
1317:	
Vallers	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1318:	
Darnen	No major limitations or hazards
1319B:	
Rockwood	Dense layer Limited available water capacity Potential for surface-water contamination Restricted permeability Surface stones Water erosion Wind erosion
1319C:	
Rockwood	Dense layer Limited available water capacity Potential for surface-water contamination Restricted permeability Surface stones Water erosion Wind erosion
1319D:	
Rockwood	Dense layer Limited available water capacity Potential for surface-water contamination Restricted permeability Slope Surface stones Water erosion Wind erosion
1320B:	
Blowers	Dense layer Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Restricted permeability Surface stones Water erosion Water table Wind erosion
1321:	
Paddock	Dense layer Potential for ground-water contamination Restricted permeability Surface stones Water table Wind erosion
1365:	
Hillview	Potential for ground-water contamination Water table Wind erosion
1825B:	
Seelyeville	High organic matter content Potential for ground-water contamination Potential for surface-water contamination Water erosion Water table

CROPLAND MANAGEMENT CONSIDERATIONS--Continued

Map symbol and soil name	Cropland management considerations
1878:	
Hamre	High organic matter content Ponding Potential for ground-water contamination Wind erosion
1938:	
Lakepark	Potential for ground-water contamination Potential poor tilth and compaction Water table
1942:	
Forada	Excessive permeability Limited available water capacity Ponding Potential for ground-water contamination
1967:	
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
Vallers	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion
1975:	
Oylen	Excessive permeability Limited available water capacity Potential for ground-water contamination Potential for surface-water contamination Water table Wind erosion
1997:	
Vallers	Lime content Potential for ground-water contamination Potential poor tilth and compaction Water table Wind erosion
Hamerly	Lime content Potential for ground-water contamination Potential for surface-water contamination Potential poor tilth and compaction Water table Wind erosion
Winger	Lime content Ponding Potential for ground-water contamination Potential poor tilth and compaction Wind erosion

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

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

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
20B---- Chapett	2e	4.7	57.0	85.0	3.2	28.0	1550.0	38.0
20C2---- Chapett	3e	3.9	50.0	70.0	2.6	23.0	1270.0	30.0
20E---- Chapett	6e	3.1	---	---	2.1	---	---	---
26---- Aazdahl	1	6.0	90.0	110.0	4.1	40.0	2000.0	54.0
33B---- Barnes	2e	5.7	86.0	104.0	3.9	37.0	1890.0	51.0
36---- Flom	2w	5.2	75.0	95.0	3.6	30.0	1730.0	45.0
38B---- Waukon	2e	5.2	80.0	95.0	3.6	33.0	1730.0	48.0
38C---- Waukon	3e	4.4	72.0	80.0	3.0	28.0	1460.0	43.0
38E---- Waukon	6e	3.6	---	---	2.4	---	---	---
40B---- Nebish	2e	5.0	77.0	90.0	3.4	31.0	1640.0	46.0
40C---- Nebish	3e	4.1	69.0	75.0	2.8	26.0	1370.0	41.0
40E---- Nebish	6e	3.4	---	---	2.3	---	---	---
47---- Colvin	2w	5.1	71.0	92.0	3.5	27.0	1670.0	42.0
63---- Rockwell	2w	5.0	69.0	90.0	3.4	26.0	1640.0	41.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
108--- McIntosh	2s	5.9	86.0	107.0	4.0	37.0	1950.0	51.0
111--- Hangaard	4w	3.1	50.0	57.0	2.1	26.0	1040.0	32.0
121--- Wykeham	1	4.4	53.0	80.0	3.0	25.0	1460.0	31.0
125--- Beltrami	2e	5.2	80.0	95.0	3.6	33.0	1730.0	48.0
133A--- Dalbo	1	5.0	77.0	91.0	3.4	31.0	1660.0	46.0
133B--- Dalbo	2e	5.0	77.0	91.0	3.4	31.0	1660.0	46.0
133C--- Dalbo	3e	4.2	69.0	76.0	2.9	26.0	1380.0	41.0
133E--- Dalbo	6e	3.4	---	---	2.3	---	---	---
137--- Dovray	3w	3.9	50.0	71.0	2.7	18.0	1290.0	30.0
141B--- Egeland	3e	5.0	71.0	90.0	3.4	28.0	1640.0	42.0
141C--- Egeland	6e	4.1	60.0	75.0	2.8	23.0	1370.0	36.0
168B--- Forman	2e	5.8	87.0	105.0	3.9	38.0	1910.0	52.0
168C2--- Forman	3e	5.4	78.0	99.0	3.7	32.0	1800.0	47.0
168D2--- Forman	4e	4.6	63.0	84.0	3.2	22.0	1530.0	38.0
168E--- Forman	6e	3.7	---	---	2.5	---	---	---
171B--- Formdale	2e	5.8	87.0	105.0	3.9	38.0	1910.0	52.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
180--- Gonvick	1	5.5	83.0	100.0	3.8	35.0	1820.0	49.0
184--- Hamerly	2s	5.9	86.0	107.0	4.0	37.0	1950.0	51.0
191--- Epoufette	4w	3.4	52.0	61.0	2.3	28.0	1110.0	34.0
202--- Meehan	4w	2.9	47.0	53.0	2.0	24.0	960.0	31.0
207D--- Nymore	6s	1.8	20.0	32.0	1.2	13.0	580.0	12.0
267B--- Snellman	2e	4.1	50.0	75.0	2.8	23.0	1370.0	30.0
267C--- Snellman	3e	3.3	42.0	60.0	2.3	18.0	1090.0	25.0
267E--- Snellman	6e	2.5	---	---	1.7	---	---	---
315A--- Bootlake	3s	2.9	38.0	53.0	2.0	19.0	960.0	22.0
315B--- Bootlake	3s	2.9	38.0	53.0	2.0	19.0	960.0	22.0
332B--- Sugarbush	3s	2.7	33.0	49.0	1.8	17.0	890.0	20.0
335--- Urness	3w	1.9	30.0	35.0	1.3	13.0	640.0	18.0
339--- Fordville	2s	4.1	68.0	75.0	2.8	35.0	1370.0	40.0
344--- Quam	3w	3.0	53.0	75.0	2.8	20.0	1370.0	31.0
351--- Colvin	3w	3.0	53.0	75.0	2.8	20.0	1370.0	31.0
375--- Forada	2w	3.6	55.0	65.0	2.4	30.0	1180.0	36.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
398--- Winger	3w	3.0	53.0	75.0	2.8	20.0	1370.0	31.0
406A--- Dorset	3s	2.9	36.0	53.0	2.0	19.0	960.0	22.0
406B--- Dorset	3s	2.9	39.0	53.0	2.0	19.0	960.0	22.0
413--- Osakis	3s	3.2	50.0	58.0	2.2	24.0	1060.0	26.0
418--- Lamoure	2w	3.9	60.0	70.0	2.6	26.0	1270.0	36.0
422B--- Bygland	2e	5.5	86.0	100.0	3.8	35.0	1820.0	51.0
422C--- Bygland	3e	5.2	75.0	95.0	3.6	30.0	1730.0	45.0
503B--- Balmlake	2e	4.1	50.0	75.0	2.8	23.0	1370.0	30.0
503C--- Balmlake	3e	3.3	42.0	60.0	2.3	18.0	1090.0	25.0
503E--- Balmlake	6e	2.5	---	---	1.7	---	---	---
508--- Wyndmere	2s	5.2	85.0	95.0	3.6	33.0	1730.0	47.0
540--- Seelyeville	6w	---	---	---	---	---	---	---
541--- Rifle	6w	---	---	---	---	---	---	---
544--- Cathro	6w	---	---	---	---	---	---	---
564--- Friendship	4s	2.6	36.0	48.0	1.8	19.0	870.0	22.0
567A--- Verndale	3s	3.1	41.0	57.0	2.1	21.0	1040.0	23.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
567B---------- Verndale	3s	3.1	41.0	57.0	2.1	21.0	1040.0	23.0
579C2----------		4.2	69.0	76.0	2.9	27.0	1390.0	39.0
Formdale---------	3e							
Langhei----------	4e							
Sandberg---------	6s							
624---------- Rosy	1	4.4	53.0	80.0	3.0	25.0	1460.0	31.0
701---------- Runeberg	6w	---	---	---	---	---	---	---
711B---------- Arvilla-Sandberg	4s	2.8	35.0	52.0	1.9	18.0	940.0	21.0
711C----------		2.3	31.0	41.0	1.6	15.0	750.0	18.0
Arvilla----------	4e							
Sandberg---------	6s							
718B---------- Naytahwaush	2e	5.0	77.0	91.0	3.4	31.0	1660.0	46.0
718C---------- Naytahwaush	3e	4.2	69.0	76.0	2.9	26.0	1380.0	41.0
718E---------- Naytahwaush	6e	3.4	---	---	2.3	---	---	---
721E---------- Corliss	7e	1.0	---	---	0.7	---	---	---
746---------- Haslie	6w	---	---	---	---	---	---	---
747B---------- Audubon	2e	5.6	84.0	101.0	3.8	36.0	1840.0	50.0
753D---------- Abbeylake	6e	1.6	20.0	32.0	1.2	13.0	580.0	13.0
753E---------- Abbeylake	7e	1.4	---	---	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	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
765--- Smiley	2w	5.2	75.0	95.0	3.6	30.0	1730.0	45.0
767--- Auganaush	2w	4.5	65.0	81.0	3.0	23.0	1470.0	39.0
775B--- Sugarbush---	3s	2.5	32.0	46.0	1.7	16.0	830.0	18.0
Two Inlets---	4s							
775C--- Sugarbush---	4e	1.9	28.0	35.0	1.4	14.0	640.0	15.0
Two Inlets---	4s							
776B--- Snellman---	2e	3.6	44.0	66.0	2.5	21.0	1200.0	26.0
Sugarbush---	3s							
776C--- Snellman---	3e	2.9	38.0	53.0	2.0	17.0	960.0	21.0
Sugarbush---	4e							
776E--- Snellman-Sugarbush	6e	2.1	---	---	1.4	---	---	---
778B--- Dorset---	3s	2.7	22.0	50.0	1.9	33.0	900.0	21.0
Corliss---	4s							
778C--- Dorset---	4e	2.1	20.0	38.0	1.4	24.0	690.0	17.0
Corliss---	4s							
780B--- Audubon-Boyerlake	2e	5.6	84.0	101.0	3.8	36.0	1830.0	52.0
780C2--- Audubon-Boyerlake	3e	4.8	75.0	87.0	3.3	31.0	1580.0	46.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
780D2---------- Audubon- Boyerlake	4e	4.2	52.0	76.0	2.8	26.0	1380.0	36.0
785---------- Hamerly--------- Winger----------	 2s 2w	5.6	81.0	102.0	3.8	34.0	1850.0	51.0
786---------- Winger---------- Hamerly--------- Colvin----------	 2w 2s 3w	4.8	72.0	92.0	3.5	28.0	1680.0	47.0
797---------- Mooselake------- Lupton----------	 6w 7w	---	---	---	---	---	---	---
867B---------- Graycalm-Menahga	4s	2.5	29.0	44.0	1.7	14.0	810.0	18.0
867C---------- Graycalm--------- Menahga----------	 6s 4s	1.9	25.0	34.0	1.3	11.0	630.0	16.0
867E---------- Graycalm--------- Menahga----------	 6s 7s	1.3	---	---	0.9	---	---	---
903B---------- Barnes---------- Langhei----------	 2e 3e	5.6	84.0	101.0	3.8	36.0	1830.0	51.0
903C2---------- Barnes---------- Langhei----------	 3e 4e	4.9	76.0	88.0	3.3	31.0	1610.0	46.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
931C2		4.9	82.0	89.0	3.4	32.0	1620.0	48.0
Formdale	3e							
Langhei	4e							
942D2		4.2	52.0	76.0	2.8	27.0	1370.0	35.0
Langhei	6e							
Barnes	4e							
943D2		4.3	53.0	77.0	2.9	27.0	1400.0	37.0
Langhei	6e							
Formdale	4e							
943E		3.2	---	---	2.1	---	---	---
Langhei	7e							
Formdale	6e							
951B		4.4	65.0	80.0	3.0	28.0	1450.0	40.0
Nebish	2e							
Sugarbush	3s							
951C		3.4	55.0	62.0	2.3	22.0	1140.0	35.0
Nebish	3e							
Sugarbush	4e							
951E Nebish-Sugarbush	6e	2.7	---	---	1.8	---	---	---
1015 Udipsamments	8s	---	---	---	---	---	---	---
1016 Udorthents	6s	---	---	---	---	---	---	---
1027. Udorthents								
1030: Pits.								
Udipsamments	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	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1104B		4.3	62.0	78.0	3.0	27.0	1420.0	39.0
Waukon	2e							
Dorset	3s							
1104C		3.6	56.0	65.0	2.4	23.0	1190.0	35.0
Waukon	3e							
Dorset	4e							
1111	6w	---	---	---	---	---	---	---
Nidaros								
1113	8w	---	---	---	---	---	---	---
Haslie-Seelyeville-Cathro								
1125B		3.0	38.0	55.0	2.0	20.0	1000.0	22.0
Sverdrup	3e							
Abbeylake	4s							
1125C		2.4	32.0	43.0	1.7	16.0	790.0	22.0
Sverdrup	4e							
Abbeylake	4s							
1126B		2.9	36.0	53.0	2.0	19.0	970.0	20.0
Verndale	3s							
Nymore	4s							
1127A		2.7	33.0	49.0	1.9	17.0	900.0	19.0
Bootlake	3s							
Graycalm	4s							
1127B		2.7	33.0	49.0	1.9	17.0	900.0	19.0
Bootlake	3s							
Graycalm	4s							
1128	6w	---	---	---	---	---	---	---
Cathro								

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1129 Lindaas	2w	5.0	72.0	91.0	3.4	28.0	1660.0	43.0
1130 Wolverton	2s	5.5	83.0	100.0	3.8	35.0	1820.0	49.0
1131B Verndale	3s	2.9	37.0	54.0	2.0	20.0	1010.0	21.0
Abbeylake	4s							
1132B Eagleview	4s	3.2	39.0	59.0	2.2	19.0	1100.0	22.0
Balmlake	2e							
1132C Eagleview	4s	2.5	33.0	46.0	1.8	15.0	840.0	19.0
Balmlake	3e							
1132E Eagleview	6s	1.8	---	---	1.3	---	---	---
Balmlake	6e							
1135 Foxlake	2w	5.0	72.0	91.0	3.4	28.0	1660.0	43.0
1136 Nidaros	6w	---	---	---	---	---	---	---
1137B Birchlake	2e	5.5	86.0	100.0	3.8	35.0	1820.0	51.0
1137C Birchlake	3e	5.2	75.0	95.0	3.6	30.0	1730.0	45.0
1137D Birchlake	4e	4.4	60.0	80.0	3.0	20.0	1460.0	36.0
1137E Birchlake	6e	3.3	---	---	2.2	---	---	---

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1138		3.0	48.0	54.0	2.0	25.0	980.0	27.0
Rushlake	4s							
Hangaard	4w							
1140B		3.2	39.0	59.0	2.2	19.0	1070.0	22.0
Eagleview	4s							
Snellman	2e							
1140C		2.5	33.0	46.0	1.8	15.0	840.0	19.0
Eagleview	4s							
Snellman	3e							
1149	2s	5.9	86.0	107.0	4.0	37.0	1950.0	51.0
Hamerly								
1195B		2.8	34.0	50.0	1.9	18.0	910.0	19.0
Sybil	3s							
Eagleview	4s							
1195C		2.2	30.0	40.0	1.5	15.0	730.0	16.0
Sybil	4e							
Eagleview	4s							
1195E		1.4	---	---	1.0	---	---	---
Sybil	6e							
Eagleview	6s							
1196B		2.6	32.0	47.0	1.7	16.0	850.0	18.0
Lida	3s							
Two Inlets	4s							
1196C		2.0	28.0	36.0	1.4	14.0	660.0	14.0
Lida	4e							
Two Inlets	4s							
1196E		1.3	---	---	0.9	---	---	---
Lida	6e							
Two Inlets	6s							

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1200--- Egglake	2w	3.6	41.0	65.0	2.4	20.0	1180.0	24.0
1201C--- Sugarbush---	4e	2.5	33.0	45.0	1.7	16.0	820.0	18.0
Snellman---	3e							
1201E--- Sugarbush-Snellman	6e	1.8	---	---	1.2	---	---	---
1210--- Paddock---	2w	3.5	45.0	63.0	2.4	23.0	1140.0	24.0
Epoufette---	3w							
1211--- Egglake---	2w	2.5	29.0	46.0	1.7	14.0	830.0	17.0
Cathro---	6w							
1225--- Wykeham---	1	4.0	49.0	72.0	2.7	24.0	1310.0	30.0
Karlstad---	3s							
1227--- Quam-Cathro-Urness	8w	---	---	---	---	---	---	---
1230--- Haslie-Nidaros	8w	---	---	---	---	---	---	---
1234B--- Formdale-Buse	2e	5.8	86.0	104.0	3.9	37.0	1890.0	52.0
1235B--- Formdale---	2e	5.0	73.0	90.0	3.4	32.0	1640.0	43.0
Buse---	2e							
Sandberg---	4s							
1236B--- Eagleview	4s	2.5	30.0	45.0	1.7	15.0	820.0	18.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1236C---------- Eagleview	4s	1.9	26.0	35.0	1.3	12.0	640.0	15.0
1236E---------- Eagleview	6s	1.3	---	---	0.9	---	---	---
1238E---------- Two Inlets------	6s	1.2	---	---	0.8	---	---	---
Sugarbush-------	6e							
1242D---------- Sandberg-Arvilla	6e	1.7	25.0	30.0	1.1	11.0	550.0	10.0
1243B---------- Sol	6s	4.1	50.0	75.0	2.8	23.0	1370.0	30.0
1243C---------- Sol	6s	3.3	42.0	60.0	2.3	18.0	1090.0	25.0
1243E---------- Sol	7s	2.5	---	---	1.7	---	---	---
1244B---------- Sol-Sugarbush	6s	3.7	45.0	67.0	2.5	21.0	1230.0	23.0
1244C---------- Sol-Sugarbush	6s	2.9	38.0	53.0	2.0	17.0	960.0	21.0
1244E---------- Sol----------	7s	2.1	---	---	1.4	---	---	---
Sugarbush-------	6s							
1246---------- Winger	2w	5.1	72.0	92.0	3.5	27.0	1670.0	42.0
1247D---------- Corliss-Dorset	6e	1.4	23.0	25.0	0.9	10.0	450.0	10.0
1248C---------- Nymore----------	6s	2.3	31.0	42.0	1.6	15.0	760.0	14.0
Verndale--------	4e							

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1249C----- Graycalm----- Bootlake-----	 6s 4e	2.1	28.0	38.0	1.4	13.0	690.0	14.0
1250C----- Abbeylake----- Verndale-----	 4s 4e	2.3	31.0	42.0	1.6	15.0	760.0	14.0
1251----- Lamoure	6w	---	---	---	---	---	---	---
1252B----- Bootlake----- Eagleview-----	 3s 4s	2.7	33.0	49.0	1.9	17.0	900.0	18.0
1263C----- Eagleview----- Bootlake-----	 4s 4e	2.2	30.0	40.0	1.5	15.0	740.0	18.0
1291----- Sedgeville	6w	---	---	---	---	---	---	---
1306----- Karlstad	3s	3.1	42.0	56.0	2.1	23.0	1020.0	25.0
1317----- Vallers	2w	5.1	72.0	92.0	3.5	27.0	1670.0	42.0
1318----- Darnen	1	5.8	83.0	105.0	3.9	35.0	1910.0	49.0
1319B----- Rockwood	2e	4.1	48.0	74.0	2.8	22.0	1350.0	29.0
1319C----- Rockwood	3e	3.3	42.0	60.0	2.3	18.0	1090.0	25.0
1319D----- Rockwood	4e	2.5	27.0	45.0	1.7	10.0	820.0	16.0
1320B----- Blowers	2e	4.3	51.0	79.0	3.0	24.0	1440.0	31.0

See footnote at end of table.

LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Alfalfa hay	Barley	Corn	Kentucky bluegrass	Soybeans	Sunflowers	Spring wheat
		Tons	Bu	Bu	AUM*	Bu	Lbs	Bu
1321--- Paddock	2w	3.5	39.0	64.0	2.4	19.0	1160.0	23.0
1365--- Hillview	2w	3.6	41.0	65.0	2.4	20.0	1180.0	24.0
1825B--- Seelyeville	7w	---	---	---	---	---	---	---
1878--- Hamre	3w	3.0	50.0	70.0	2.6	17.0	1270.0	30.0
1938--- Lakepark	2w	5.2	75.0	95.0	3.6	30.0	1730.0	45.0
1942--- Forada	6w	---	---	---	---	---	---	---
1967---		5.9	86.0	107.0	4.0	37.0	1950.0	52.0
Hamerly---	2s							
Vallers---	2w							
1975--- Oylen	3s	3.3	50.0	60.0	2.3	25.0	1090.0	27.0
1997---		4.9	72.0	93.0	3.5	29.0	1690.0	45.0
Vallers---	2w							
Hamerly---	2s							
Winger---	3w							

* 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
20B	Chapett fine sandy loam, 2 to 8 percent slopes
26	Aazdahl clay loam
33B	Barnes loam, 2 to 6 percent slopes
36	Flom silty clay loam (where drained)
38B	Waukon loam, 2 to 8 percent slopes
40B	Nebish loam, 2 to 8 percent slopes
47	Colvin silty clay loam (where drained)
63	Rockwell loam (where drained)
108	McIntosh silt loam
121	Wykeham fine sandy loam
125	Beltrami loam
133A	Dalbo silt loam, 0 to 2 percent slopes
133B	Dalbo silt loam, 2 to 8 percent slopes
141B	Egeland fine sandy loam, 1 to 6 percent slopes
168B	Forman clay loam, 2 to 6 percent slopes
171B	Formdale clay loam, 2 to 5 percent slopes
180	Gonvick loam
184	Hamerly loam
267B	Snellman sandy loam, 2 to 8 percent slopes
339	Fordville loam
375	Forada loam (where drained)
418	Lamoure silty clay loam, occasionally flooded (where drained)
422B	Bygland silty clay loam, 1 to 6 percent slopes
503B	Balmlake fine sandy loam, 1 to 8 percent slopes
508	Wyndmere fine sandy loam
624	Rosy sandy loam
718B	Naytahwaush loam, 2 to 8 percent slopes
747B	Audubon silty clay loam, 0 to 6 percent slopes
765	Smiley loam (where drained)
767	Auganaush loam (where drained)
780B	Audubon-Boyerlake complex, 1 to 6 percent slopes
785	Hamerly-Winger complex (where drained)
786	Winger-Hamerly-Colvin complex (where drained)
903B	Barnes-Langhei complex, 2 to 6 percent slopes
1129	Lindaas silty clay loam, morainic (where drained)
1130	Wolverton fine sandy loam
1135	Foxlake silty clay loam (where drained)
1137B	Birchlake silty clay loam, 1 to 6 percent slopes
1149	Hamerly clay loam
1200	Egglake loam (where drained)
1234B	Formdale-Buse complex, 2 to 6 percent slopes
1246	Winger silty clay loam (where drained)
1317	Vallers silty clay loam (where drained)
1318	Darnen loam
1319B	Rockwood sandy loam, 2 to 6 percent slopes, stony
1320B	Blowers sandy loam, 1 to 5 percent slopes, stony
1321	Paddock fine sandy loam, stony (where drained)
1365	Hillview fine sandy loam (where drained)
1938	Lakepark clay loam (where drained)
1967	Hamerly-Vallers complex (where drained)
1997	Vallers-Hamerly-Winger complex (where drained)

WINDBREAKS AND ENVIRONMENTAL PLANTINGS

Map symbol and soil name	Trees having predicted 20-year average height, in feet, of--				
	<8	8-15	16-25	26-35	>35
20B:					
Chapett	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
20C2:					
Chapett	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
20E:					
Chapett	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
26:					
Aazdahl	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
33B:					
Barnes	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
36:					
Flom	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
38B:					
Waukon	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
38C:					
Waukon	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
38E:					
Waukon	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.

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
40B: Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
40C: Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
40E: Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
47: Colvin	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
63: Rockwell	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
108: McIntosh	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
111: Hangaard	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
121: Wykeham	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.

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
125:					
Beltrami	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
133A:					
Dalbo	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
133B:					
Dalbo	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
133C:					
Dalbo	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
133E:					
Dalbo	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
137:					
Dovray	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
141B:					
Egeland	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
141C:					
Egeland	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
168B:					
Forman	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.

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
168C2: Forman	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
168D2: Forman	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
168E: Forman	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
171B: Formdale	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
180: Gonvick	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
184: Hamerly	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
191: Epoufette	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
202: Meehan	---	Redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Silver maple, Carolina poplar, Siouxland cottonwood.
207D: Nymore	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---

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
267B:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
267C:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
267E:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
315A:					
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
315B:					
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
332B:					
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
335:					
Urness----------	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow-----	Carolina poplar.
339:					
Fordville-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
344:					
Quam------------	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.

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
351: Colvin	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
375: Forada	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
398: Winger	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
406A: Dorset	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
406B: Dorset	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
413: Osakis	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
418: Lamoure	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
422B: Bygland	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
422C: Bygland	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.

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
503B:					
Balmlake	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
503C:					
Balmlake	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
503E:					
Balmlake	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
508:					
Wyndmere	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
540:					
Seelyeville	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow	Carolina poplar.
541:					
Rifle	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow	Carolina poplar.
544:					
Cathro	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow	Carolina poplar.
564:					
Friendship	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
567A:					
Verndale	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.

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
567B:					
Verndale	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
579C2:					
Formdale	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
Langhei	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
Sandberg	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
624:					
Rosy	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
701:					
Runeberg	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
711B:					
Arvilla	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Sandberg	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
711C:					
Arvilla	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Sandberg	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---

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
718B: Naytahwaush	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
718C: Naytahwaush	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
718E: Naytahwaush	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
721E: Corliss	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
746: Haslie	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow	Carolina poplar.
747B: Audubon	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
753D: Abbeylake	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
753E: Abbeylake	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
765: Smiley	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.

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
767:					
Auganaush-------	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
775B:					
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Two Inlets------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
775C:					
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Two Inlets------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
776B:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
776C:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.

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
776E:					
Snellman--------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
778B:					
Dorset----------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Corliss---------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
778C:					
Dorset----------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Corliss---------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
780B:					
Audubon---------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
Boyerlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
780C2:					
Audubon---------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.

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
780C2:					
Boyerlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
780D2:					
Audubon---------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
Boyerlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
785:					
Hamerly---------	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
Winger----------	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
786:					
Winger----------	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
Hamerly---------	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
Colvin----------	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
797:					
Mooselake-------	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow-----	Carolina poplar.

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
797:					
Lupton----------	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow-----	Carolina poplar.
867B:					
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Menahga---------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
867C:					
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Menahga---------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
867E:					
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Menahga---------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
903B:					
Barnes----------	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
Langhei---------	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
903C2:					
Barnes----------	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.

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
903C2:					
Langhei---	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
931C2:					
Formdale---	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
Langhei---	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
942D2:					
Langhei---	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
Barnes---	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
943D2:					
Langhei---	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
Formdale---	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
943E:					
Langhei---	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---

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
943E:					
Formdale	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
951B:					
Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
951C:					
Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
951E:					
Nebish	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1104B:					
Waukon	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Dorset	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.

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
1104C:					
Waukon	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Dorset	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1125B:					
Sverdrup	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Abbeylake	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1125C:					
Sverdrup	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Abbeylake	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1126B:					
Verndale	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Nymore	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1127A:					
Bootlake	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.

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
1127A:					
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1127B:					
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1129:					
Lindaas---------	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1130:					
Wolverton-------	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
1131B:					
Verndale--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Abbeylake-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1132B:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Balmlake--------	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.

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
1132C:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Balmlake--------	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
1132E:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Balmlake--------	---	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, white spruce, Black Hills spruce, red pine.	Green ash, eastern white pine.	Silver maple, eastern cottonwood.
1135:					
Foxlake---------	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1136:					
Nidaros---------	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow-----	Carolina poplar.
1137B:					
Birchlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
1137C:					
Birchlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
1137D:					
Birchlake-------	American plum-----	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.

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
1137E:					
Birchlake	American plum	Amur maple, Siberian peashrub, late lilac.	Sugar maple, hackberry, Russian-olive, white spruce, Black Hills spruce.	Silver maple, green ash.	Eastern cottonwood.
1138:					
Rushlake	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
Hangaard	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1140B:					
Eagleview	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Snellman	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1140C:					
Eagleview	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Snellman	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1149:					
Hamerly	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
1195B:					
Sybil	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.

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
1195B:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1195C:					
Sybil-----------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1195E:					
Sybil-----------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1196B:					
Lida------------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Two Inlets------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1196C:					
Lida------------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Two Inlets------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---

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
1196E:					
Lida	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Two Inlets	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1200:					
Egglake	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1201C:					
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Snellman	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1201E:					
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
Snellman	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1210:					
Paddock	---	Redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Silver maple, Carolina poplar, Siouxland cottonwood.
Epoufette	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.

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
1211:					
Egglake---------	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
Cathro----------	---	Redosier dogwood, Tatarian honeysuckle.	Black ash, tamarack, black spruce.	Golden willow-----	Carolina poplar.
1225:					
Wykeham---------	Nanking cherry----	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
Karlstad--------	Nanking cherry----	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1234B:					
Formdale--------	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
Buse------------	Tatarian honeysuckle.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash---------	---	---
1235B:					
Formdale--------	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
Buse------------	Tatarian honeysuckle, American plum, late lilac.	Siberian peashrub, hackberry, Russian-olive, eastern redcedar, Black Hills spruce, blue spruce.	Green ash, bur oak	Eastern cottonwood	---
Sandberg--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1236B:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---

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
1236C:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1236E:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1238E:					
Two Inlets------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Sugarbush-------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
1242D:					
Sandberg--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Arvilla---------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
1243B:					
Sol-------------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1243C:					
Sol-------------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1243E:					
Sol-------------	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.

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
1244B:					
Sol	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1244C:					
Sol	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1244E:					
Sol	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
Sugarbush	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1246:					
Winger	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
1247D:					
Corliss	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Dorset	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.

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
1248C:					
Nymore----------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Verndale--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
1249C:					
Graycalm--------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
1250C:					
Abbeylake-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Verndale--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
1252B:					
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
1263C:					
Eagleview-------	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, late lilac.	Green ash, white spruce, ponderosa pine, red pine, Scotch pine.	Eastern cottonwood	---
Bootlake--------	Tatarian honeysuckle, late lilac.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash---------	Eastern cottonwood.

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
1306: Karlstad	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1317: Vallers	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
1318: Darnen	---	Siberian peashrub, redosier dogwood, American plum, late lilac.	Hackberry, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash.	Carolina poplar, Siouxland cottonwood.
1319B: Rockwood	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1319C: Rockwood	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1319D: Rockwood	---	Amur maple, Siberian peashrub, redosier dogwood, late lilac.	Sugar maple, Russian-olive, Black Hills spruce, blue spruce.	Silver maple, green ash, red pine.	Carolina poplar.
1320B: Blowers	Nanking cherry	Siberian peashrub, redosier dogwood, blue spruce, late lilac.	Hackberry, Russian-olive, Black Hills spruce.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1321: Paddock	---	Redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Silver maple, Carolina poplar, Siouxland cottonwood.
1365: Hillview	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.

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
1878:					
Hamre	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
1938:					
Lakepark	---	Hedge cotoneaster, redosier dogwood, Tatarian honeysuckle, late lilac.	Hackberry, white spruce, Black Hills spruce, northern whitecedar.	Green ash, golden willow.	Carolina poplar, Siouxland cottonwood.
1942:					
Forada	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.
1967:					
Hamerly	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
Vallers	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
1975:					
Oylen	Tatarian honeysuckle.	Siberian peashrub, eastern redcedar, American plum, common chokecherry, bur oak.	Russian-olive, white spruce, red pine.	Green ash	Eastern cottonwood.
1997:					
Vallers	Redosier dogwood	Tatarian honeysuckle, American plum, common chokecherry, late lilac, northern whitecedar.	Hackberry, white spruce, Black Hills spruce.	Green ash, golden willow.	Siouxland cottonwood.
Hamerly	---	Siberian peashrub, Tatarian honeysuckle, blue spruce, late lilac.	Russian-olive, Black Hills spruce, Scotch pine, red splendor crabapple.	Hackberry, green ash, laurel willow.	Siouxland cottonwood.
Winger	---	Redosier dogwood	Black ash, green ash, tamarack, black spruce.	Eastern cottonwood, golden willow.	Robusta cottonwood.

WINDBREAK SUITABILITY GROUPS

(Suitable shrubs and trees with their mature heights are listed in the "Windbreaks and Environmental Plantings" table. Absence of an entry indicates that a windbreak suitability group is not assigned)

Map symbol and soil name	Windbreak suitability group
20B, 20C2, 20E: Chapett	3
26: Aazdahl	1
33B: Barnes	3
36: Flom	2
38B, 38C, 38E: Waukon	3
40B, 40C, 40E: Nebish	3
47: Colvin	2K
63: Rockwell	2K
108: McIntosh	1K
111: Hangaard	2
121: Wykeham	1
125: Beltrami	1
133A, 133B, 133C, 133E: Dalbo	4
137: Dovray	2W
141B, 141C: Egeland	5
168B, 168C2, 168D2, 168E: Forman	3
171B: Formdale	3
180: Gonvick	1
184: Hamerly	1K

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
191:	
Epoufette	2
202:	
Meehan	1
207D:	
Nymore	7
267B, 267C, 267E:	
Snellman	3
315A, 315B:	
Bootlake	6G
332B:	
Sugarbush	6G
335:	
Urness	2W
339:	
Fordville	6G
344:	
Quam	2W
351:	
Colvin	2W
375:	
Forada	2
398:	
Winger	2W
406A, 406B:	
Dorset	6G
413:	
Osakis	1
418:	
Lamoure	2K
422B, 422C:	
Bygland	4
503B, 503C, 503E:	
Balmlake	5
508:	
Wyndmere	1K
540:	
Seelyeville	2H
541:	
Rifle	2H
544:	
Cathro	2H

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
564:	
Friendship	7
567A, 567B:	
Verndale	7
579C2:	
Formdale	3
Langhei	8
Sandberg	7
624:	
Rosy	1
701:	
Runeberg	2W
711B, 711C:	
Arvilla	6G
Sandberg	7
718B, 718C, 718E:	
Naytahwaush	4
721E:	
Corliss	7
746:	
Haslie	2H
747B:	
Audubon	4
753D, 753E:	
Abbeylake	7
765:	
Smiley	2
767:	
Auganaush	2
775B, 775C:	
Sugarbush	6G
Two Inlets	7
776B, 776C, 776E:	
Snellman	3
Sugarbush	6G
778B, 778C:	
Dorset	6G
Corliss	7

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
780B, 780C2, 780D2:	
Audubon	4
Boyerlake	4
785:	
Hamerly	1K
Winger	2K
786:	
Winger	2K
Hamerly	1K
Colvin	2K
797:	
Mooselake	2H
Lupton	2H
867B, 867C, 867E:	
Graycalm	7
Menahga	7
903B, 903C2:	
Barnes	3
Langhei	8
931C2:	
Formdale	3
Langhei	8
942D2:	
Langhei	8
Barnes	3
943D2, 943E:	
Langhei	8
Formdale	3
951B, 951C, 951E:	
Nebish	3
Sugarbush	6G
1015:	
Udipsamments.	
1016, 1027:	
Udorthents.	
1030:	
Pits.	
Udipsamments.	

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
1104B, 1104C:	
Waukon	3
Dorset	6G
1111:	
Nidaros	10
1113:	
Haslie	10
Seelyeville	10
Cathro	10
1125B, 1125C:	
Sverdrup	6G
Abbeylake	7
1126B:	
Verndale	7
Nymore	7
1127A, 1127B:	
Bootlake	7
Graycalm	7
1128:	
Cathro	10
1129:	
Lindaas	2
1130:	
Wolverton	1K
1131B:	
Verndale	7
Abbeylake	7
1132B, 1132C, 1132E:	
Eagleview	7
Balmlake	5
1135:	
Foxlake	2
1136:	
Nidaros	2H
1137B, 1137C, 1137D, 1137E:	
Birchlake	4
1138:	
Rushlake	1
Hangaard	2

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
1140B, 1140C:	
Eagleview	7
Snellman	3
1149:	
Hamerly	1K
1195B, 1195C, 1195E:	
Sybil	6G
Eagleview	7
1196B, 1196C, 1196E:	
Lida	6G
Two Inlets	7
1200:	
Egglake	2
1201C, 1201E:	
Sugarbush	6G
Snellman	3
1210:	
Paddock	2
Epoufette	2
1211:	
Egglake	2
Cathro	2H
1225:	
Wykeham	1
Karlstad	1
1227:	
Quam	10
Cathro	10
Urness	10
1230:	
Haslie	10
Nidaros	10
1234B:	
Formdale	3
Buse	8
1235B:	
Formdale	3
Buse	8
Sandberg	7

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
1236B, 1236C, 1236E:	
Eagleview	7
1238E:	
Two Inlets	7
Sugarbush	6G
1242D:	
Sandberg	7
Arvilla	6G
1243B, 1243C, 1243E:	
Sol	3
1244B, 1244C, 1244E:	
Sol	3
Sugarbush	6G
1246:	
Winger	2K
1247D:	
Corliss	7
Dorset	6G
1248C:	
Nymore	7
Verndale	7
1249C:	
Graycalm	7
Bootlake	6G
1250C:	
Abbeylake	7
Verndale	7
1251:	
Lamoure	2
1252B:	
Bootlake	6G
Eagleview	7
1263C:	
Eagleview	7
Bootlake	6G
1291:	
Sedgeville	10
1306:	
Karlstad	1

WINDBREAK SUITABILITY GROUPS--Continued

Map symbol and soil name	Windbreak suitability group
1317:	
Vallers	2K
1318:	
Darnen	3
1319B, 1319C, 1319D:	
Rockwood	4F
1320B:	
Blowers	4F
1321:	
Paddock	2
1365:	
Hillview	2
1825B:	
Seelyeville	10
1878:	
Hamre	2W
1938:	
Lakepark	2
1942:	
Forada	2W
1967:	
Hamerly	1K
Vallers	2K
1975:	
Oylen	1
1997:	
Vallers	2K
Hamerly	1K
Winger	2W

Forest Land

Allen Wickman, private forest management specialist, Minnesota Department of Natural Resources, helped prepare this section.

Forested areas cover approximately 323,000 acres, or 39 percent of the total land area of Becker County. About 59 percent of the forest land is privately owned, and 41 percent is publicly owned. Of the publicly owned lands, 64,000 acres is county owned, 36,600 acres is owned by the State of Minnesota, 3,900 acres is Indian land, and 23,300 acres is Federal land.

The highly variable soil types and terrain conditions in Becker County support a large variety of timber types. Most tree species can grow under a wide variety of soil conditions. Aspen is the dominant tree species in Becker County. It makes up 48 percent of the commercial forest land. Other hardwood forest types, which include maple, basswood, red oak, bur oak, paper birch, elm, and ash, make up about 35 percent. Softwood forest types, which include tamarack, jack pine, balsam fir, black spruce, white spruce, red pine, and white pine, make up about 17 percent of the commercial forest land (fig. II-3).

The forested areas in the western half of Becker County consist mainly of hardwood forest types. Aspen, maple, basswood, red oak, and bur oak are the primary tree species in these areas. Red oak has the highest timber value of any of the hardwoods grown in the county. Sugar maple has the lowest value because of frequent frost cracks.

Most conifers are on the coarser textured glacial outwash soils in the eastern half of Becker County. Jack pine and red pine commonly grow on the most droughty sites. Conifers that prefer the moister, finer textured soils include white pine, white spruce, and balsam fir. Tamarack and black spruce typically grow in depressional areas of organic soils.

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

An explanation of the criteria for each of the considerations listed in the table is given in the following paragraphs.

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.

Rubbly surface.—The word "rubbly" 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

An explanation of the criteria for each of the considerations listed in the table is given in the following paragraphs.

Slope.—The slope is 8 percent or more (fig. II-4).

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.

Figure II-3.—A stand of red pine in an area of Eagleview loamy sand, 1 to 8 percent slopes. This species is adapted to droughty soils.

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.

Rubbly surface.—The word "rubbly" is in the map unit name.

Forest Log Landing Considerations

An explanation of the criteria for each of the considerations listed in the table is given in the following paragraphs.

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.

Rubbly surface.—The word "rubbly" is in the map unit name.

Forest Land Site Preparation and Planting Considerations

An explanation of the criteria for each of the considerations listed in the table is given in the following paragraphs.

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).

Figure II-4.—A logging road in an area of Eagleview loamy sand, 8 to 15 percent slopes. Because of the slope, erosion is a problem and ruts have formed.

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.

Rubbly surface.—The word "rubbly" is in the map unit name.

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

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
20B, 20C2: Chapett	Susceptible to rutting and wheel slippage
20E: Chapett	Slope Susceptible to rutting and wheel slippage
38B, 38C: Waukon	Susceptible to rutting and wheel slippage
38E: Waukon	Slope Susceptible to rutting and wheel slippage
40B, 40C: Nebish	Susceptible to rutting and wheel slippage
40E: Nebish	Slope Susceptible to rutting and wheel slippage
121: Wykeham	Susceptible to rutting and wheel slippage
125: Beltrami	Susceptible to rutting and wheel slippage
133A, 133B, 133C: Dalbo	Susceptible to rutting and wheel slippage
133E: Dalbo	Slope Susceptible to rutting and wheel slippage
168B, 168C2: Forman	Susceptible to rutting and wheel slippage
168D2, 168E: Forman	Slope Susceptible to rutting and wheel slippage
180: Gonvick	Susceptible to rutting and wheel slippage
191: Epoufette	Poor traction (loose sandy material) Wetness
202: Meehan	Poor traction (loose sandy material) Wetness
207D: Nymore	Poor traction (loose sandy material) Slope
267B, 267C: Snellman	Susceptible to rutting and wheel slippage

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
267E:	
Snellman	Slope Susceptible to rutting and wheel slippage
315A, 315B:	
Bootlake	Poor traction (loose sandy material)
332B:	
Sugarbush	Poor traction (loose sandy material)
406A, 406B:	
Dorset	Susceptible to rutting and wheel slippage
422B, 422C:	
Bygland	Susceptible to rutting and wheel slippage
503B, 503C:	
Balmlake	No major considerations or hazards
503E:	
Balmlake	Slope
540:	
Seelyeville	Susceptible to rutting and wheel slippage Wetness
541:	
Rifle	Susceptible to rutting and wheel slippage Wetness
564:	
Friendship	Poor traction (loose sandy material)
567A, 567B:	
Verndale	No major considerations or hazards
624:	
Rosy	Susceptible to rutting and wheel slippage
701:	
Runeberg	Susceptible to rutting and wheel slippage Wetness
718B, 718C:	
Naytahwaush	Susceptible to rutting and wheel slippage
718E:	
Naytahwaush	Slope Susceptible to rutting and wheel slippage
721E:	
Corliss	Poor traction (loose sandy material) Slope
753D, 753E:	
Abbeylake	Poor traction (loose sandy material) Slope
767:	
Auganaush	Susceptible to rutting and wheel slippage Wetness
775B, 775C:	
Sugarbush	Poor traction (loose sandy material)

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
775B, 775C:	
Two Inlets	Poor traction (loose sandy material)
776B, 776C:	
Snellman	Susceptible to rutting and wheel slippage
Sugarbush	Poor traction (loose sandy material)
776E:	
Snellman	Slope Susceptible to rutting and wheel slippage
Sugarbush	Poor traction (loose sandy material) Slope
778B, 778C:	
Dorset	Susceptible to rutting and wheel slippage
Corliss	Poor traction (loose sandy material)
797:	
Mooselake	Susceptible to rutting and wheel slippage Wetness
Lupton	Susceptible to rutting and wheel slippage Wetness
867B, 867C:	
Graycalm	Poor traction (loose sandy material)
Menahga	Poor traction (loose sandy material)
867E:	
Graycalm	Poor traction (loose sandy material) Slope
Menahga	Poor traction (loose sandy material) Slope
951B, 951C:	
Nebish	Susceptible to rutting and wheel slippage
Sugarbush	Poor traction (loose sandy material)
951E:	
Nebish	Slope Susceptible to rutting and wheel slippage
Sugarbush	Poor traction (loose sandy material) Slope
1104B, 1104C:	
Waukon	Susceptible to rutting and wheel slippage
Dorset	Susceptible to rutting and wheel slippage
1111:	
Nidaros	Flooding Susceptible to rutting and wheel slippage Wetness
1125B, 1125C:	
Sverdrup	Poor traction (loose sandy material)

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
1125B, 1125C:	
Abbeylake	Poor traction (loose sandy material)
1126B:	
Verndale	No major considerations or hazards
Nymore	Poor traction (loose sandy material)
1127A, 1127B:	
Bootlake	Poor traction (loose sandy material)
Graycalm	Poor traction (loose sandy material)
1129:	
Lindaas	Susceptible to rutting and wheel slippage Wetness
1131B:	
Verndale	No major considerations or hazards
Abbeylake	Poor traction (loose sandy material)
1132B, 1132C:	
Eagleview	Poor traction (loose sandy material)
Balmlake	No major considerations or hazards
1132E:	
Eagleview	Poor traction (loose sandy material) Slope
Balmlake	Slope
1136:	
Nidaros	Susceptible to rutting and wheel slippage Wetness
1137B, 1137C:	
Birchlake	Susceptible to rutting and wheel slippage Wetness
1137D, 1137E:	
Birchlake	Slope Susceptible to rutting and wheel slippage Wetness
1138:	
Rushlake	Poor traction (loose sandy material)
Hangaard	Wetness
1140B, 1140C:	
Eagleview	Poor traction (loose sandy material)
Snellman	Susceptible to rutting and wheel slippage
1195B, 1195C:	
Sybil	Poor traction (loose sandy material)
Eagleview	Poor traction (loose sandy material)

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
1195E:	
Sybil	Slope
Eagleview	Poor traction (loose sandy material) Slope
1196B:	
Lida	No major considerations or hazards
Two Inlets	No major considerations or hazards
1196C:	
Lida	No major considerations or hazards
Two Inlets	Poor traction (loose sandy material)
1196E:	
Lida	Slope
Two Inlets	Poor traction (loose sandy material) Slope
1200:	
Egglake	Susceptible to rutting and wheel slippage Wetness
1201C:	
Sugarbush	Poor traction (loose sandy material)
Snellman	Susceptible to rutting and wheel slippage
1201E:	
Sugarbush	Poor traction (loose sandy material) Slope
Snellman	Slope Susceptible to rutting and wheel slippage
1210:	
Paddock	Wetness
Epoufette	Poor traction (loose sandy material) Wetness
1211:	
Egglake	Susceptible to rutting and wheel slippage Wetness
Cathro	Susceptible to rutting and wheel slippage Wetness
1225:	
Wykeham	Susceptible to rutting and wheel slippage
Karlstad	No major considerations or hazards
1236B, 1236C:	
Eagleview	Poor traction (loose sandy material)
1236E:	
Eagleview	Poor traction (loose sandy material) Slope

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
1238E:	
Two Inlets	Poor traction (loose sandy material) Slope
Sugarbush	Poor traction (loose sandy material) Slope
1243B, 1243C:	
Sol	Susceptible to rutting and wheel slippage
1243E:	
Sol	Slope Susceptible to rutting and wheel slippage
1244B, 1244C:	
Sol	No major considerations or hazards
Sugarbush	Poor traction (loose sandy material)
1244E:	
Sol	Slope
Sugarbush	Poor traction (loose sandy material) Slope
1247D:	
Corliss	Poor traction (loose sandy material) Slope
Dorset	Slope Susceptible to rutting and wheel slippage
1248C:	
Nymore	Poor traction (loose sandy material)
Verndale	No major considerations or hazards
1249C:	
Graycalm	Poor traction (loose sandy material)
Bootlake	Poor traction (loose sandy material)
1250C:	
Abbeylake	Poor traction (loose sandy material)
Verndale	No major considerations or hazards
1252B:	
Bootlake	Poor traction (loose sandy material)
Eagleview	Poor traction (loose sandy material)
1263C:	
Eagleview	Poor traction (loose sandy material)
Bootlake	Poor traction (loose sandy material)
1291:	
Sedgeville	Flooding Susceptible to rutting and wheel slippage Wetness
1306:	
Karlstad	No major considerations or hazards

FOREST LAND HARVEST EQUIPMENT CONSIDERATIONS--Continued

Map symbol and soil name	Forest land harvest equipment considerations
1319B, 1319C:	
Rockwood	Poor traction (loose sandy material)
1319D:	
Rockwood	Poor traction (loose sandy material) Slope
1320B:	
Blowers	Wetness
1321:	
Paddock	Wetness
1365:	
Hillview	Poor traction (loose sandy material) Wetness
1878:	
Hamre	Susceptible to rutting and wheel slippage Wetness
1975:	
Oylen	No major considerations or hazards

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
20B, 20C2, 20E:	
Chapett	Low bearing strength Slope
38B, 38C, 38E:	
Waukon	Low bearing strength Slope
40B, 40C, 40E:	
Nebish	Low bearing strength Slope
121:	
Wykeham	Low bearing strength
125:	
Beltrami	Low bearing strength
133A:	
Dalbo	Low bearing strength
133B, 133C, 133E:	
Dalbo	Low bearing strength Slope
168B:	
Forman	Low bearing strength
168C2, 168D2, 168E:	
Forman	Low bearing strength Slope
180:	
Gonvick	Low bearing strength
191:	
Epoufette	Wetness
202:	
Meehan	Wetness
207D:	
Nymore	Slope
267B, 267C, 267E:	
Snellman	Low bearing strength Slope
315A, 315B:	
Bootlake	No major considerations or hazards
332B:	
Sugarbush	Slope
406A, 406B:	
Dorset	Low bearing strength
422B:	
Bygland	Low bearing strength

FOREST HAUL ROAD CONSIDERATIONS--Continued

Map symbol and soil name	Forest haul road considerations
422C:	
Bygland	Low bearing strength Slope
503B, 503C, 503E:	
Balmlake	Slope
540:	
Seelyeville	Low bearing strength Wetness
541:	
Rifle	Low bearing strength Wetness
564:	
Friendship	No major considerations or hazards
567A, 567B:	
Verndale	No major considerations or hazards
624:	
Rosy	Low bearing strength
701:	
Runeberg	Low bearing strength Wetness
718B, 718C, 718E:	
Naytahwaush	Low bearing strength Slope
721E:	
Corliss	Slope
753D, 753E:	
Abbeylake	Slope
767:	
Auganaush	Low bearing strength Wetness
775B, 775C:	
Sugarbush	Slope
Two Inlets	Slope
776B, 776C, 776E:	
Snellman	Low bearing strength Slope
Sugarbush	Slope
778B:	
Dorset	Low bearing strength
Corliss	No major considerations or hazards
778C:	
Dorset	Low bearing strength Slope
Corliss	Slope

FOREST HAUL ROAD CONSIDERATIONS--Continued

Map symbol and soil name	Forest haul road considerations
797:	
Mooselake	Low bearing strength Wetness
Lupton	Low bearing strength Wetness
867B, 867C, 867E:	
Graycalm	Slope
Menahga	Slope
951B, 951C, 951E:	
Nebish	Low bearing strength Slope
Sugarbush	Slope
1104B, 1104C:	
Waukon	Low bearing strength Slope
Dorset	Low bearing strength Slope
1111:	
Nidaros	Flooding Low bearing strength Wetness
1125B:	
Sverdrup	No major considerations or hazards
Abbeylake	No major considerations or hazards
1125C:	
Sverdrup	Slope
Abbeylake	Slope
1126B:	
Verndale	No major considerations or hazards
Nymore	No major considerations or hazards
1127A:	
Bootlake	No major considerations or hazards
Graycalm	No major considerations or hazards
1127B:	
Bootlake	Slope
Graycalm	Slope
1129:	
Lindaas	Low bearing strength Wetness
1131B:	
Verndale	No major considerations or hazards
Abbeylake	No major considerations or hazards

FOREST HAUL ROAD CONSIDERATIONS--Continued

Map symbol and soil name	Forest haul road considerations
1132B, 1132C, 1132E:	
Eagleview	Slope
Balmlake	Slope
1136:	
Nidaros	Low bearing strength Wetness
1137B:	
Birchlake	Low bearing strength Wetness
1137C, 1137D, 1137E:	
Birchlake	Low bearing strength Slope Wetness
1138:	
Rushlake	No major considerations or hazards
Hangaard	Wetness
1140B, 1140C:	
Eagleview	Slope
Snellman	Low bearing strength Slope
1195B, 1195C, 1195E:	
Sybil	Slope
Eagleview	Slope
1196B, 1196C, 1196E:	
Lida	Slope
Two Inlets	Slope
1200:	
Egglake	Low bearing strength Wetness
1201C, 1201E:	
Sugarbush	Slope
Snellman	Low bearing strength Slope
1210:	
Paddock	Wetness
Epoufette	Wetness
1211:	
Egglake	Low bearing strength Wetness
Cathro	Low bearing strength Wetness

FOREST HAUL ROAD CONSIDERATIONS--Continued

Map symbol and soil name	Forest haul road considerations
1225:	
Wykeham	Low bearing strength
Karlstad	No major considerations or hazards
1236B, 1236C, 1236E:	
Eagleview	Slope
1238E:	
Two Inlets	Slope
Sugarbush	Slope
1243B, 1243C, 1243E:	
Sol	Low bearing strength Slope
1244B, 1244C, 1244E:	
Sol	Slope
Sugarbush	Slope
1247D:	
Corliss	Slope
Dorset	Low bearing strength Slope
1248C:	
Nymore	Slope
Verndale	Slope
1249C:	
Graycalm	Slope
Bootlake	Slope
1250C:	
Abbeylake	Slope
Verndale	Slope
1252B:	
Bootlake	Slope
Eagleview	Slope
1263C:	
Eagleview	Slope
Bootlake	Slope
1291:	
Sedgeville	Flooding Low bearing strength Wetness
1306:	
Karlstad	No major considerations or hazards
1319B:	
Rockwood	No major considerations or hazards

FOREST HAUL ROAD CONSIDERATIONS--Continued

Map symbol and soil name	Forest haul road considerations
1319C, 1319D:	
Rockwood	Slope
1320B:	
Blowers	Wetness
1321:	
Paddock	Wetness
1365:	
Hillview	Wetness
1878:	
Hamre	Low bearing strength Wetness
1975:	
Oylen	No major considerations or hazards

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
20B, 20C2, 20E:	
Chapett	Slope Susceptible to rutting and wheel slippage
38B, 38C, 38E:	
Waukon	Slope Susceptible to rutting and wheel slippage
40B, 40C, 40E:	
Nebish	Slope Susceptible to rutting and wheel slippage
121:	
Wykeham	Susceptible to rutting and wheel slippage
125:	
Beltrami	Susceptible to rutting and wheel slippage
133A:	
Dalbo	Susceptible to rutting and wheel slippage
133B, 133C, 133E:	
Dalbo	Slope Susceptible to rutting and wheel slippage
168B, 168C2, 168D2, 168E:	
Forman	Slope Susceptible to rutting and wheel slippage
180:	
Gonvick	Susceptible to rutting and wheel slippage
191:	
Epoufette	Wetness
202:	
Meehan	Wetness
207D:	
Nymore	Slope
267B, 267C, 267E:	
Snellman	Slope Susceptible to rutting and wheel slippage
315A:	
Bootlake	No major considerations or hazards
315B:	
Bootlake	Slope
332B:	
Sugarbush	Slope
406A:	
Dorset	Susceptible to rutting and wheel slippage
406B:	
Dorset	Slope Susceptible to rutting and wheel slippage

FOREST LOG LANDING CONSIDERATIONS--Continued

Map symbol and soil name	Forest log landing considerations
422B, 422C:	
Bygland	Slope Susceptible to rutting and wheel slippage
503B, 503C, 503E:	
Balmlake	Slope
540:	
Seelyeville	Susceptible to rutting and wheel slippage Wetness
541:	
Rifle	Susceptible to rutting and wheel slippage Wetness
564:	
Friendship	No major considerations or hazards
567A:	
Verndale	No major considerations or hazards
567B:	
Verndale	Slope
624:	
Rosy	Susceptible to rutting and wheel slippage
701:	
Runeberg	Susceptible to rutting and wheel slippage Wetness
718B, 718C, 718E:	
Naytahwaush	Slope Susceptible to rutting and wheel slippage
721E:	
Corliss	Slope
753D, 753E:	
Abbeylake	Slope
767:	
Auganaush	Susceptible to rutting and wheel slippage Wetness
775B, 775C:	
Sugarbush	Slope
Two Inlets	Slope
776B, 776C, 776E:	
Snellman	Slope Susceptible to rutting and wheel slippage
Sugarbush	Slope
778B, 778C:	
Dorset	Slope Susceptible to rutting and wheel slippage
Corliss	Slope

FOREST LOG LANDING CONSIDERATIONS--Continued

Map symbol and soil name	Forest log landing considerations
797:	
Mooselake	Susceptible to rutting and wheel slippage Wetness
Lupton	Susceptible to rutting and wheel slippage Wetness
867B, 867C, 867E:	
Graycalm	Slope
Menahga	Slope
951B, 951C, 951E:	
Nebish	Slope Susceptible to rutting and wheel slippage
Sugarbush	Slope
1104B, 1104C:	
Waukon	Slope Susceptible to rutting and wheel slippage
Dorset	Slope Susceptible to rutting and wheel slippage
1111:	
Nidaros	Flooding Susceptible to rutting and wheel slippage Wetness
1125B, 1125C:	
Sverdrup	Slope
Abbeylake	Slope
1126B:	
Verndale	Slope
Nymore	Slope
1127A:	
Bootlake	No major considerations or hazards
Graycalm	No major considerations or hazards
1127B:	
Bootlake	Slope
Graycalm	Slope
1129:	
Lindaas	Susceptible to rutting and wheel slippage Wetness
1131B:	
Verndale	Slope
Abbeylake	Slope
1132B, 1132C, 1132E:	
Eagleview	Slope
Balmlake	Slope

FOREST LOG LANDING CONSIDERATIONS--Continued

Map symbol and soil name	Forest log landing considerations
1136:	
Nidaros	Susceptible to rutting and wheel slippage Wetness
1137B, 1137C, 1137D, 1137E:	
Birchlake	Slope Susceptible to rutting and wheel slippage Wetness
1138:	
Rushlake	No major considerations or hazards
Hangaard	Wetness
1140B, 1140C:	
Eagleview	Slope
Snellman	Slope Susceptible to rutting and wheel slippage
1195B, 1195C, 1195E:	
Sybil	Slope
Eagleview	Slope
1196B, 1196C, 1196E:	
Lida	Slope
Two Inlets	Slope
1200:	
Egglake	Susceptible to rutting and wheel slippage Wetness
1201C, 1201E:	
Sugarbush	Slope
Snellman	Slope Susceptible to rutting and wheel slippage
1210:	
Paddock	Wetness
Epoufette	Wetness
1211:	
Egglake	Susceptible to rutting and wheel slippage Wetness
Cathro	Susceptible to rutting and wheel slippage Wetness
1225:	
Wykeham	Susceptible to rutting and wheel slippage
Karlstad	No major considerations or hazards
1236B, 1236C, 1236E:	
Eagleview	Slope
1238E:	
Two Inlets	Slope

FOREST LOG LANDING CONSIDERATIONS--Continued

Map symbol and soil name	Forest log landing considerations
1238E:	
Sugarbush	Slope
1243B, 1243C, 1243E:	
Sol	Slope Susceptible to rutting and wheel slippage
1244B, 1244C, 1244E:	
Sol	Slope
Sugarbush	Slope
1247D:	
Corliss	Slope
Dorset	Slope Susceptible to rutting and wheel slippage
1248C:	
Nymore	Slope
Verndale	Slope
1249C:	
Graycalm	Slope
Bootlake	Slope
1250C:	
Abbeylake	Slope
Verndale	Slope
1252B:	
Bootlake	Slope
Eagleview	Slope
1263C:	
Eagleview	Slope
Bootlake	Slope
1291:	
Sedgeville	Flooding Susceptible to rutting and wheel slippage Wetness
1306:	
Karlstad	No major considerations or hazards
1319B, 1319C, 1319D:	
Rockwood	Slope
1320B:	
Blowers	Slope Wetness
1321:	
Paddock	Wetness
1365:	
Hillview	Wetness

FOREST LOG LANDING CONSIDERATIONS--Continued

Map symbol and soil name	Forest log landing considerations
1878:	
Hamre	Susceptible to rutting and wheel slippage Wetness
1975:	
Oylen	No major considerations or hazards

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
20B, 20C2:	
Chapett	Water erosion
20E:	
Chapett	Slope Water erosion
38B, 38C:	
Waukon	Potential poor tilth and compaction Water erosion
38E:	
Waukon	Potential poor tilth and compaction Slope Water erosion
40B, 40C:	
Nebish	Water erosion
40E:	
Nebish	Slope Water erosion
121:	
Wykeham	No major considerations or hazards
125:	
Beltrami	No major considerations or hazards
133A:	
Dalbo	No major considerations or hazards
133B, 133C:	
Dalbo	Water erosion
133E:	
Dalbo	Slope Water erosion
168B:	
Forman	Potential poor tilth and compaction
168C2:	
Forman	Potential poor tilth and compaction Water erosion
168D2, 168E:	
Forman	Potential poor tilth and compaction Slope Water erosion
180:	
Gonvick	No major considerations or hazards
191:	
Epoufette	Wetness
202:	
Meehan	Wetness

FOREST LAND SITE PREPARATION AND PLANTING CONSIDERATIONS--Continued

Map symbol and soil name	Site preparation and planting considerations
207D:	
Nymore	Slope Water erosion
267B, 267C:	
Snellman	Water erosion
267E:	
Snellman	Slope Water erosion
315A, 315B:	
Bootlake	No major considerations or hazards
332B:	
Sugarbush	Water erosion
406A, 406B:	
Dorset	No major considerations or hazards
422B:	
Bygland	Potential poor tilth and compaction
422C:	
Bygland	Potential poor tilth and compaction Water erosion
503B, 503C:	
Balmlake	Water erosion
503E:	
Balmlake	Slope Water erosion
540:	
Seelyeville	Wetness
541:	
Rifle	Wetness
564:	
Friendship	No major considerations or hazards
567A, 567B:	
Verndale	No major considerations or hazards
624:	
Rosy	No major considerations or hazards
701:	
Runeberg	Potential poor tilth and compaction Wetness
718B, 718C:	
Naytahwaush	Potential poor tilth and compaction Water erosion
718E:	
Naytahwaush	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
721E:	
Corliss	Slope Water erosion
753D, 753E:	
Abbeylake	Slope Water erosion
767:	
Auganaush	Potential poor tilth and compaction Wetness
775B, 775C:	
Sugarbush	Water erosion
Two Inlets	Water erosion
776B, 776C:	
Snellman	Water erosion
Sugarbush	Water erosion
776E:	
Snellman	Slope Water erosion
Sugarbush	Slope Water erosion
778B:	
Dorset	No major considerations or hazards
Corliss	No major considerations or hazards
778C:	
Dorset	Water erosion
Corliss	Water erosion
797:	
Mooselake	Wetness
Lupton	Wetness
867B, 867C:	
Graycalm	Water erosion
Menahga	Water erosion
867E:	
Graycalm	Slope Water erosion
Menahga	Slope Water erosion
951B, 951C:	
Nebish	Water erosion
Sugarbush	Water erosion
951E:	
Nebish	Slope Water erosion

FOREST LAND SITE PREPARATION AND PLANTING CONSIDERATIONS--Continued

Map symbol and soil name	Site preparation and planting considerations
951E:	
Sugarbush	Slope Water erosion
1104B, 1104C:	
Waukon	Potential poor tilth and compaction Water erosion
Dorset	Water erosion
1111:	
Nidaros	Flooding Wetness
1125B:	
Sverdrup	No major considerations or hazards
Abbeylake	No major considerations or hazards
1125C:	
Sverdrup	Water erosion
Abbeylake	Water erosion
1126B:	
Verndale	No major considerations or hazards
Nymore	No major considerations or hazards
1127A:	
Bootlake	No major considerations or hazards
Graycalm	No major considerations or hazards
1127B:	
Bootlake	Water erosion
Graycalm	Water erosion
1129:	
Lindaas	Wetness
1131B:	
Verndale	No major considerations or hazards
Abbeylake	No major considerations or hazards
1132B, 1132C:	
Eagleview	Water erosion
Balmlake	Water erosion
1132E:	
Eagleview	Slope Water erosion
Balmlake	Slope Water erosion
1136:	
Nidaros	Wetness

FOREST LAND SITE PREPARATION AND PLANTING CONSIDERATIONS--Continued

Map symbol and soil name	Site preparation and planting considerations
1137B:	
Birchlake	Potential poor tilth and compaction Wetness
1137C:	
Birchlake	Potential poor tilth and compaction Water erosion Wetness
1137D, 1137E:	
Birchlake	Potential poor tilth and compaction Slope Water erosion Wetness
1138:	
Rushlake	No major considerations or hazards
Hangaard	Wetness
1140B, 1140C:	
Eagleview	Water erosion
Snellman	Water erosion
1195B, 1195C:	
Sybil	Water erosion
Eagleview	Water erosion
1195E:	
Sybil	Slope Water erosion
Eagleview	Slope Water erosion
1196B, 1196C:	
Lida	Water erosion
Two Inlets	Water erosion
1196E:	
Lida	Slope Water erosion
Two Inlets	Slope Water erosion
1200:	
Egglake	Wetness
1201C:	
Sugarbush	Water erosion
Snellman	Water erosion
1201E:	
Sugarbush	Slope Water erosion
Snellman	Slope Water erosion

FOREST LAND SITE PREPARATION AND PLANTING CONSIDERATIONS--Continued

Map symbol and soil name	Site preparation and planting considerations
1210:	
Paddock	Wetness
Epoufette	Wetness
1211:	
Egglake	Wetness
Cathro	Wetness
1225:	
Wykeham	No major considerations or hazards
Karlstad	No major considerations or hazards
1236B, 1236C:	
Eagleview	Water erosion
1236E:	
Eagleview	Slope Water erosion
1238E:	
Two Inlets	Slope Water erosion
Sugarbush	Slope Water erosion
1243B, 1243C:	
Sol	Surface stones Water erosion
1243E:	
Sol	Slope Surface stones Water erosion
1244B, 1244C:	
Sol	Surface stones Water erosion
Sugarbush	Surface stones Water erosion
1244E:	
Sol	Slope Surface stones Water erosion
Sugarbush	Slope Surface stones Water erosion
1247D:	
Corliss	Slope Water erosion
Dorset	Slope Water erosion

FOREST LAND SITE PREPARATION AND PLANTING CONSIDERATIONS--Continued

Map symbol and soil name	Site preparation and planting considerations
1248C:	
Nymore	Water erosion
Verndale	Water erosion
1249C:	
Graycalm	Water erosion
Bootlake	Water erosion
1250C:	
Abbeylake	Water erosion
Verndale	Water erosion
1252B:	
Bootlake	Water erosion
Eagleview	Water erosion
1263C:	
Eagleview	Water erosion
Bootlake	Water erosion
1291:	
Sedgeville	Flooding Potential poor tilth and compaction Wetness
1306:	
Karlstad	No major considerations or hazards
1319B:	
Rockwood	Surface stones
1319C:	
Rockwood	Surface stones Water erosion
1319D:	
Rockwood	Slope Surface stones Water erosion
1320B:	
Blowers	Surface stones Wetness
1321:	
Paddock	Surface stones Wetness
1365:	
Hillview	Wetness
1878:	
Hamre	Wetness
1975:	
Oylen	No major considerations or hazards

Recreation

Greg A. Hildenbrand, executive director, Detroit Lakes Regional Chamber of Commerce, helped prepare this section.

Becker County is a prime tourist area because of the natural beauty of its lakes and forests. There are 412 lakes within a 25-mile radius of the city of Detroit Lakes. These lakes are used extensively for fishing, boating, swimming, and other recreational activities. Approximately 100 resorts along these lakes host many tourists during the summer. The city of Detroit Lakes has a mile-long public beach that attracts many tourists (fig. II-5).

Approximately 181,600 acres of county, State, and Federal lands in Becker County are available to the public for hunting and other recreational activities. The largest contiguous area of public land is the Tamarack National Wildlife Refuge, which has a surface area of 42,700 acres of land and water. The refuge is a nesting ground for ducks, geese, and grouse. Parts of the refuge are a sanctuary for waterfowl during their migrations. Hunting of white-tailed deer, ruffed grouse, and waterfowl is permitted in specified areas on the refuge. The refuge contains a large population of nesting bald eagles.

The county has nine public golf courses, about 200 miles of snowmobile trails, and 50 miles of cross-country skiing trails. Detroit Mountain, near Detroit Lakes, is a downhill skiing area.

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

Figure II-5.—This public beach is in an area of Rushlake and Hangaard soils, lake beaches, on Little Detroit Lake. The many lakes in Becker County provide numerous opportunities for recreational activities.

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)

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
20B: Chapett	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
20C2: Chapett	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
20E: Chapett	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
26: Aazdahl	Slight	Slight	Slight	Slight	Slight.
33B: Barnes	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
36: Flom	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
38B: Waukon	Slight	Slight	Moderate: slope.	Slight	Slight.
38C: Waukon	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
38E: Waukon	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
40B: Nebish	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
40C: Nebish	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
40E: Nebish	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
47: Colvin	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
63: Rockwell	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
108:					
McIntosh	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Slight	Slight.
111:					
Hangaard	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
121:					
Wykeham	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
125:					
Beltrami	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
133A:					
Dalbo	Slight	Slight	Slight	Severe: erodes easily.	Slight.
133B:					
Dalbo	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
133C:					
Dalbo	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
133E:					
Dalbo	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
137:					
Dovray	Severe: ponding, too clayey.	Severe: ponding, too clayey.	Severe: too clayey, ponding.	Severe: ponding, too clayey.	Severe: ponding, too clayey.
141B:					
Egeland	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
141C:					
Egeland	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
168B:					
Forman	Slight	Slight	Moderate: slope.	Slight	Slight.
168C2:					
Forman	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
168D2:					
Forman	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
168E: Forman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
171B: Formdale	Slight	Slight	Moderate: slope.	Slight	Slight.
180: Gonvick	Slight	Slight	Moderate: slope.	Slight	Slight.
184: Hamerly	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Slight	Slight.
191: Epoufette	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
202: Meehan	Severe: wetness, too acid.	Severe: too acid.	Severe: wetness, too acid.	Moderate: wetness, too sandy.	Severe: too acid.
207D: Nymore	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: droughty, slope.
267B: Snellman	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
267C: Snellman	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
267E: Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
315A: Bootlake	Slight	Slight	Slight	Slight	Moderate: droughty.
315B: Bootlake	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
332B: Sugarbush	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
335: Urness	Severe: 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
339: Fordville	Slight	Slight	Slight	Slight	Slight.
344: Quam	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
351: Colvin	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
375: Forada	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
398: Winger	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
406A: Dorset	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
406B: Dorset	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
413: Osakis	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
418: Lamoure	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
422B: Bygland	Slight	Slight	Moderate: slope.	Slight	Slight.
422C: Bygland	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
503B: Balmlake	Slight	Slight	Moderate: slope.	Slight	Slight.
503C: Balmlake	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
503E: Balmlake	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
508: Wyndmere	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
540:					
Seelyeville	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
541:					
Rifle	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
544:					
Cathro	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
564:					
Friendship	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Moderate: droughty.
567A:					
Verndale	Slight	Slight	Moderate: small stones.	Slight	Moderate: droughty.
567B:					
Verndale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
579C2:					
Formdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Langhei	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
Sandberg	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty.
624:					
Rosy	Slight	Slight	Slight	Slight	Slight.
701:					
Runeberg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
711B:					
Arvilla	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Sandberg	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
711C:					
Arvilla	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Sandberg	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
718B: Naytahwaush	Slight	Slight	Moderate: slope.	Slight	Slight.
718C: Naytahwaush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
718E: Naytahwaush	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
721E: Corliss	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
746: Haslie	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
747B: Audubon	Slight	Slight	Moderate: slope.	Slight	Slight.
753D: Abbeylake	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: droughty, slope.
753E: Abbeylake	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
765: Smiley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
767: Auganaush	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
775B: Sugarbush	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
Two Inlets	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
775C: Sugarbush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Two Inlets	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
776B:					
Snellman	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
Sugarbush	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
776C:					
Snellman	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Sugarbush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
776E:					
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Sugarbush	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
778B:					
Dorset	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
Corliss	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Severe: droughty.
778C:					
Dorset	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Corliss	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
780B:					
Audubon	Slight	Slight	Moderate: slope.	Slight	Slight.
Boyerlake	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, percs slowly.	Slight	Slight.
780C2:					
Audubon	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Boyerlake	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
780D2:					
Audubon	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
780D2:					
Boyerlake	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
785:					
Hamerly	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Winger	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
786:					
Winger	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Hamerly	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Colvin	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
797:					
Mooselake	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Lupton	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
867B:					
Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Severe: droughty.
Menahga	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
867C:					
Graycalm	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
Menahga	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
867E:					
Graycalm	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: droughty, slope.
Menahga	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
903B:					
Barnes	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Langhei	Slight	Slight	Moderate: slope.	Slight	Slight.
903C2:					
Barnes	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Langhei	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
931C2:					
Formdale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Langhei	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
942D2:					
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Barnes	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
943D2:					
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Formdale	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
943E:					
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Formdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
951B:					
Nebish	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Sugarbush	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
951C:					
Nebish	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Sugarbush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
951E:					
Nebish	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Sugarbush	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1015:					
Udipsamments	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty, too sandy.
1016:					
Udorthents	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1027:					
Udorthents.					
1030:					
Pits.					
Udipsamments	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: slope, too sandy.	Severe: too sandy, slope.	Severe: slope.
1104B:					
Waukon	Slight	Slight	Moderate: slope.	Slight	Slight.
Dorset	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
1104C:					
Waukon	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
Dorset	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
1111:					
Nidaros	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
1113:					
Haslie	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.
Cathro	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1125B:					
Sverdrup	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Abbeylake	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
1125C:					
Sverdrup	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Abbeylake	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
1126B:					
Verndale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
Nymore	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, too sandy.	Moderate: too sandy.	Severe: droughty.
1127A:					
Bootlake	Slight	Slight	Slight	Slight	Moderate: droughty.
Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
1127B:					
Bootlake	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Graycalm	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Severe: droughty.
1128:					
Cathro	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
1129:					
Lindaas	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
1130:					
Wolverton	Slight	Slight	Slight	Slight	Slight.
1131B:					
Verndale	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1131B:					
Abbeylake	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
1132B:					
Eagleview	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
Balmlake	Slight	Slight	Moderate: slope.	Slight	Slight.
1132C:					
Eagleview	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
Balmlake	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
1132E:					
Eagleview	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.
Balmlake	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1135:					
Foxlake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1136:					
Nidaros	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
1137B:					
Birchlake	Slight	Slight	Moderate: slope.	Slight	Slight.
1137C:					
Birchlake	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.
1137D:					
Birchlake	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1137E:					
Birchlake	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1138:					
Rushlake	Moderate: too sandy.	Moderate: too sandy.	Moderate: small stones, too sandy.	Moderate: too sandy.	Severe: droughty.
Hangaard	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1140B:					
Eagleview	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
Snellman	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
1140C:					
Eagleview	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
Snellman	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
1149:					
Hamerly	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
1195B:					
Sybil	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Eagleview	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
1195C:					
Sybil	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Eagleview	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
1195E:					
Sybil	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Eagleview	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.
1196B:					
Lida	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones, droughty.
Two Inlets	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
1196C:					
Lida	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, droughty, slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1196C:					
Two Inlets	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight	Moderate: small stones, droughty, slope.
1196E:					
Lida	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Two Inlets	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
1200:					
Egglake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1201C:					
Sugarbush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
Snellman	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
1201E:					
Sugarbush	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1210:					
Paddock	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: large stones, wetness.
Epoufette	Severe: wetness.	Severe: wetness.	Severe: small stones, wetness.	Severe: wetness.	Severe: wetness.
1211:					
Egglake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Cathro	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
1225:					
Wykeham	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Karlstad	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
1227:					
Quam	Severe: 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
1227:					
Cathro	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Urness	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1230:					
Haslie	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
Nidaros	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
1234B:					
Formdale	Slight	Slight	Moderate: slope.	Slight	Slight.
Buse	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
1235B:					
Formdale	Slight	Slight	Moderate: slope.	Slight	Slight.
Buse	Slight	Slight	Moderate: slope, small stones.	Slight	Slight.
Sandberg	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight	Moderate: small stones, droughty.
1236B:					
Eagleview	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
1236C:					
Eagleview	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
1236E:					
Eagleview	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: slope.
1238E:					
Two Inlets	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
Sugarbush	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1242D:					
Sandberg	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1242D:					
Arvilla	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1243B:					
Sol	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
1243C:					
Sol	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
1243E:					
Sol	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1244B:					
Sol	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.
Sugarbush	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: droughty.
1244C:					
Sol	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
Sugarbush	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
1244E:					
Sol	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Sugarbush	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1246:					
Winger	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
1247D:					
Corliss	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: too sandy, slope.	Severe: droughty, slope.
Dorset	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1248C:					
Nymore	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
Verndale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1249C:					
Graycalm	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
Bootlake	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
1250C:					
Abbeylake	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Severe: droughty.
Verndale	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
1251:					
Lamoure	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
1252B:					
Bootlake	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Eagleview	Moderate: too sandy.	Moderate: too sandy.	Moderate: slope, small stones.	Moderate: too sandy.	Moderate: droughty.
1263C:					
Eagleview	Moderate: slope, too sandy.	Moderate: slope, too sandy.	Severe: slope.	Moderate: too sandy.	Moderate: droughty, slope.
Bootlake	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: droughty, slope.
1291:					
Sedgeville	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
1306:					
Karlstad	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
1317:					
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1318:					
Darnen	Slight	Slight	Slight	Slight	Slight.
1319B:					
Rockwood	Slight	Slight	Moderate: slope, small stones.	Slight	Moderate: large stones.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1319C:					
Rockwood	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: large stones, slope.
1319D:					
Rockwood	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
1320B:					
Blowers	Moderate: wetness.	Moderate: wetness.	Moderate: slope, small stones, wetness.	Slight	Moderate: large stones.
1321:					
Paddock	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: large stones, wetness.
1365:					
Hillview	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1825B:					
Seelyeville	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: excess humus, wetness.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
1878:					
Hamre	Severe: ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, excess humus.
1938:					
Lakepark	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1942:					
Forada	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
1967:					
Hamerly	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
1975:					
Oylen	Moderate: wetness.	Moderate: wetness.	Moderate: small stones, wetness.	Slight	Moderate: droughty.
1997:					
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
Hamerly	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight	Slight.

RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
1997: Winger----------	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.

Wildlife Habitat

Earl Johnson, area wildlife manager, Minnesota Department of Natural Resources, helped prepare this section.

The soil and water resources of Becker County are the basis for a variety of vegetation communities that provide habitat for many wildlife species. The county is in an area of ecological transition between the prairie and the woodlands. This transition area is a result of the influences of climate, precipitation, and environmental factors. The eastern part of the county is dominated by a woodland landscape that provides habitat for forest and forest-edge wildlife species, such as ruffed grouse, woodcock, white-tailed deer, black bear, gray squirrel, and snowshoe hare. The major forest types are aspen and oak. These species produce the best habitat when they are managed in small, interspersed stands of various ages.

Woodland lakes and wetlands provide habitat for beaver, otter, mink, muskrat, common loons, Canada geese, wood duck, ring-necked duck, mallard, and common goldeneye. The western part of the county features prairie soils and abundant wetlands. It is inhabited by prairie wildlife, including pheasant, greater prairie chicken, Hungarian partridge, white-tailed deer, jackrabbit, Canada geese, and many species of ducks. Common duck species include wood duck, mallard, ring-necked duck, blue-winged teal, gadwall, redhead, and canvasback.

Although more than 99 percent of the native prairie has been plowed and is under intensive agricultural management, sizable remnants of native prairie habitat exist in the northwestern part of the county within Federal waterfowl production areas, State-owned wildlife management areas, and tracts privately owned by The Nature Conservancy. These prairie remnants support populations of rarely seen native grasses, flowers, and nongame mammals, birds, amphibians, reptiles, and insects.

Nongame wildlife species are abundant in Becker County. Populations of bald eagles and trumpeter swans are noteworthy. Bald eagles occupied 30 known nests in 1991. This number represents a three-fold increase over the known nests 10 years earlier. The trumpeter swan had disappeared from Minnesota since before 1900 because of market harvesting for meat and feathers. A restoration project was started in 1982 to reestablish this majestic bird to the marshes of Minnesota. From 1987 through 1991, about 152 swans have been released in Minnesota, including 139 in various marshes in Becker County. In 1991, ten pairs of swans successfully nested and reared 26 cygnets.

Becker County has abundant public lands that provide important habitat for wildlife. In the western half of the county are 51 federally owned waterfowl production areas covering about 11,000 acres. There are also 16 State-owned wildlife management areas making up about 7,600 acres. The Hamden Slough National Wildlife Refuge has 2,500 acres under Federal ownership. The eastern half of Becker County has 75,600 acres of tax-forfeited lands under county forest management and 45,000 acres of State-owned lands managed for timber and wildlife production. The federally owned Tamarack National Wildlife Refuge encompasses an area of 42,700 acres and is managed for waterfowl, wildlife, and timber production.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. If food, cover, or water is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area.

If the soils have potential for habitat development, wildlife habitat can be created or improved by planting appropriate vegetation, properly managing the existing plant cover, and fostering the natural establishment of desirable plants.

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

Figure II-6.—This area of Haslie, Seelyeville, and Cathro soils, ponded, provides good habitat for wetland 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 bluestems, indiangrass, 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, boxelder, 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, 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.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Examples are mountainmahogany, bitterbrush, snowberry, and big sagebrush.

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, 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, white-tailed 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 (fig. II-6). The wildlife attracted to this habitat include ducks, geese, herons, bitterns, rails, muskrat, otter, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. The wildlife attracted to rangeland include antelope, deer, sage grouse, meadowlark, and lark bunting.

WILDLIFE HABITAT

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
20B: Chapett	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
20C2: Chapett	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
20E: Chapett	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
26: Aazdahl	Good	Good	Good	Good	Good	---	Poor	Fair	Good	Fair	Poor	---
33B: Barnes	Good	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.	Fair.
36: Flom	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Fair.
38B: Waukon	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
38C: Waukon	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
38E: Waukon	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
40B: Nebish	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
40C: Nebish	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
40E: Nebish	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
47: Colvin	Good	Good	Fair	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Fair.
63: Rockwell	Fair	Fair	Good	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	Fair.
108: McIntosh	Good	Good	Good	Fair	Fair	Fair	Poor	Poor	Good	Fair	Poor	Good.
111: Hangaard	Poor	Fair	Fair	Fair	Poor	---	Good	Good	Fair	Fair	Good	---
121: Wykeham	Good	Good	Good	Good	Fair	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
125: Beltrami	Good	Good	Good	Good	Fair	---	Very poor.	Very poor.	Good	Good	Very poor.	---
133A: Dalbo	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
133B: Dalbo	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
133C: Dalbo	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	---
133E: Dalbo	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	---
137: Dovray	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor.
141B: Egeland	Fair	Fair	Good	Fair	Very poor.	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Good.
141C: Egeland	Very poor.	Fair	Good	Poor	Very poor.	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Good.
168B: Forman	Good	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.	Fair.
168C2: Forman	Fair	Good	Good	Good	Good	Fair	Very poor.	Very poor.	Good	Good	Very poor.	Fair.
168D2: Forman	Poor	Good	Good	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
168E: Forman	Very poor.	Very poor.	Good	Good	Good	Fair	Very poor.	Very poor.	Very poor.	Good	Very poor.	Fair.
171B: Formdale	Good	Good	Good	Good	Fair	---	Poor	Fair	Good	Fair	Poor	---
180: Gonvick	Good	Good	Good	Good	Fair	---	Poor	Poor	Good	Good	Poor	---
184: Hamerly	Good	Good	Good	Good	Good	Fair	Fair	Poor	Good	Good	Poor	Fair.
191: Epoufette	Fair	Fair	Poor	Poor	Poor	---	Good	Good	Fair	Poor	Good	---
202: Meehan	Poor	Fair	Good	Fair	Fair	---	Fair	Fair	Fair	Fair	Fair	---

WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
207D: Nymore	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Very poor.	Fair	Very poor.	---
267B: Snellman	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
267C: Snellman	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
267E: Snellman	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
315A: Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
315B: Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
332B: Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
335: Urness	Fair	Fair	Fair	Poor	Very poor.	Poor	Good	Good	Fair	Poor	Poor	---
339: Fordville	Good	Good	Good	Poor	Very poor.	Fair	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
344: Quam	Fair	Fair	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good	Poor.
351: Colvin	Fair	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good	Fair.
375: Forada	Good	Good	Fair	Fair	Fair	---	Good	Good	Good	Fair	Good	---
398: Winger	Fair	Fair	Fair	Poor	Poor	Fair	Good	Good	Fair	Poor	Good	---
406A: Dorset	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
406B: Dorset	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
413: Osakis	Fair	Fair	Fair	Poor	Poor	---	Poor	Poor	Fair	Poor	Poor	---
418: Lamoure	Good	Good	Fair	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.

WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
422B: Bygland	Good	Good	Good	Fair	---	Fair	Poor	Poor	Good	Poor	Poor	---
422C: Bygland	Good	Good	Good	Fair	---	Fair	Poor	Poor	Good	Poor	Poor	---
503B: Balmlake	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
503C: Balmlake	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
503E: Balmlake	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
508: Wyndmere	Fair	Good	Good	Good	Good	Fair	Fair	Poor	Good	Good	Poor	Fair.
540: Seelyeville	Very poor.	Fair	Good	Poor	Poor	---	Good	Good	Fair	Poor	Good	---
541: Rifle	Fair	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
544: Cathro	Poor	Fair	Fair	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
564: Friendship	Poor	Fair	Good	Fair	Good	---	Poor	Very poor.	Fair	Good	Very poor.	---
567A: Verndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
567B: Verndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
579C2: Formdale	Good	Good	Good	Good	Fair	---	Poor	Fair	Good	Fair	Poor	---
Langhei	Fair	Good	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Sandberg	Poor	Poor	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.	---
624: Rosy	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
701: Runeberg	Very poor.	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
711B: Arvilla	Fair	Good	Fair	Fair	Fair	Poor	Very poor.	Very poor.	Fair	Fair	Very poor.	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
711B:												
Sandberg--------	Poor	Poor	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.	---
711C:												
Arvilla---------	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Very poor.	Fair	Fair	Very poor.	Poor.
Sandberg--------	Poor	Poor	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.	---
718B:												
Naytahwaush-----	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
718C:												
Naytahwaush-----	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
718E:												
Naytahwaush-----	Very poor.	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
721E:												
Corliss---------	Very poor.	Very poor.	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
746:												
Haslie----------	Poor	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
747B:												
Audubon---------	Good	Good	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
753D:												
Abbeylake-------	Poor	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
753E:												
Abbeylake-------	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
765:												
Smiley----------	Good	Good	Fair	Fair	Fair	Fair	Fair	Good	Fair	---	Good	Fair.
767:												
Auganaush-------	Poor	Fair	Fair	Fair	Fair	---	Good	Fair	Fair	Fair	Fair	---
775B:												
Sugarbush-------	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Two Inlets------	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
775C:												
Sugarbush-------	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Two Inlets------	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
776B:												
Snellman	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
776C:												
Snellman	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
776E:												
Snellman	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Sugarbush	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
778B:												
Dorset	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Corliss	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
778C:												
Dorset	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Corliss	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
780B:												
Audubon	Good	Good	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
Boyerlake	Fair	Good	Fair	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
780C2:												
Audubon	Good	Good	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
Boyerlake	Fair	Good	Fair	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
780D2:												
Audubon	Fair	Good	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Poor	Very poor.	---
Boyerlake	Fair	Fair	Fair	Poor	Poor	---	Very poor.	Very poor.	Fair	Poor	Very poor.	---
785:												
Hamerly	Good	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
Winger	Good	Good	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.

WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
786:												
Winger	Good	Good	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
Hamerly	Good	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
Colvin	Fair	Fair	Fair	Poor	Poor	Poor	Good	Good	Fair	Poor	Good	Fair.
797:												
Mooselake	Very poor.	Poor	Poor	Poor	Fair	---	Good	Good	Poor	Poor	Good	---
Lupton	Fair	Poor	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
867B:												
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Menahga	Poor	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
867C:												
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Menahga	Poor	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
867E:												
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Menahga	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
903B:												
Barnes	Good	Good	Good	Good	Good	Fair	Poor	Very poor.	Good	Good	Very poor.	Fair.
Langhei	Good	Good	Fair	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.	Fair.
903C2:												
Barnes	Fair	Good	Good	Good	Good	Fair	Very poor.	Very poor.	Good	Good	Very poor.	Fair.
Langhei	Fair	Good	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
931C2:												
Formdale	Good	Good	Good	Good	Fair	---	Poor	Fair	Good	Fair	Poor	---
Langhei	Fair	Good	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
942D2:												
Langhei	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Barnes	Poor	Fair	Good	Good	Good	Fair	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.

WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
943D2:												
Langhei	Fair	Fair	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.	Fair.
Formdale	Fair	Good	Good	Good	Fair	---	Poor	Poor	Good	Fair	Poor	---
943E:												
Langhei	Poor	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Formdale	Poor	Fair	Good	Good	Fair	---	Very poor.	Very poor.	Good	Fair	Very poor.	---
951B:												
Nebish	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
951C:												
Nebish	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
951E:												
Nebish	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Sugarbush	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1015:												
Udipsamments.												
1016:												
Udorthents	Poor	Poor	Fair	Good	Good	Fair	Poor	Very poor.	Poor	Fair	Very poor.	Fair.
1027:												
Udorthents.												
1030:												
Pits.												
Udipsamments.												
1104B:												
Waukon	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
Dorset	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1104C:												
Waukon	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Dorset	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1111:												
Nidaros	Very poor.	Very poor.	Poor	Poor	Poor	---	Good	Good	Very poor.	Poor	Good	---
1113:												
Haslie	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---	Good	Good	Poor	Very poor.	Good	---
Seelyeville	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good	---
Cathro	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good	---
1125B:												
Sverdrup	Fair	Fair	Fair	Fair	Fair	---	Poor	Very poor.	Fair	Fair	Poor	---
Abbeylake	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1125C:												
Sverdrup	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Abbeylake	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1126B:												
Verndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
Nymore	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
1127A:												
Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
1127B:												
Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
1128:												
Cathro	Poor	Fair	Fair	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
1129:												
Lindaas	Good	Good	Good	Good	Good	Good	Good	Good	Fair	Fair	Good	---
1130:												
Wolverton	Good	Good	Good	Fair	Poor	Poor	Poor	Poor	Good	Fair	Poor	---
1131B:												
Verndale	Good	Good	Good	Good	Good	---	Poor	Very 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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1131B:												
Abbeylake	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1132B:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Balmlake	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1132C:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Balmlake	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1132E:												
Eagleview	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Balmlake	Fair	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1135:												
Foxlake	Good	Good	Good	Poor	Poor	---	Good	Good	Good	Poor	Good	---
1136:												
Nidaros	Very poor.	Very poor.	Poor	Poor	Poor	---	Good	Good	Poor	Poor	Good	---
1137B:												
Birchlake	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1137C:												
Birchlake	Good	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
1137D:												
Birchlake	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
1137E:												
Birchlake	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
1138:												
Rushlake	Poor	Good	Good	Good	Good	---	Fair	Poor	Good	Good	Fair	---
Hangaard	Poor	Fair	Fair	Fair	Poor	---	Good	Good	Fair	Fair	Good	---
1140B:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Snellman	Good	Good	Good	Good	Good	---	Poor	Very 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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1140C:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Snellman	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
1149:												
Hamerly	Good	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
1195B:												
Sybil	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1195C:												
Sybil	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1195E:												
Sybil	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Eagleview	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
1196B:												
Lida	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Two Inlets	Fair	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1196C:												
Lida	Fair	Good	Good	Good	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
Two Inlets	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
1196E:												
Lida	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Two Inlets	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
1200:												
Egglake	Good	Good	Good	Good	Good	Good	Good	Good	Fair	Fair	Good	---
1201C:												
Sugarbush	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Snellman	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1201E:												
Sugarbush	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Snellman	Very poor.	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1210:												
Paddock	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
Epoufette	Fair	Fair	Poor	Poor	Poor	---	Good	Good	Fair	Poor	Good	---
1211:												
Egglake	Good	Good	Good	Good	Good	Good	Good	Good	Fair	Fair	Good	---
Cathro	Poor	Fair	Fair	Fair	Fair	---	Good	Good	Poor	Fair	Good	---
1225:												
Wykeham	Good	Good	Good	Good	Fair	Good	Poor	Poor	Good	Good	Poor	---
Karlstad	Poor	Fair	Fair	Fair	Fair	---	Poor	Very poor.	Poor	Fair	Very poor.	---
1227:												
Quam	Very poor.	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good	Very poor.
Cathro	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good	---
Urness	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good	---
1230:												
Haslie	Very poor.	Very poor.	Poor	Very poor.	Very poor.	---	Good	Good	Poor	Very poor.	Good	---
Nidaros	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	---	Good	Good	Very poor.	Very poor.	Good	---
1234B:												
Formdale	Good	Good	Good	Good	Fair	---	Poor	Fair	Good	Fair	Poor	---
Buse	Good	Good	Fair	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.	Fair.
1235B:												
Formdale	Good	Good	Good	Good	Fair	---	Poor	Fair	Good	Fair	Poor	---
Buse	Good	Good	Fair	Fair	Fair	Fair	Poor	Very poor.	Good	Fair	Very poor.	Fair.
Sandberg	Poor	Poor	Good	Poor	Poor	---	Very poor.	Very poor.	Good	Good	Very poor.	---
1236B:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1236C:												
Eagleview	Poor	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1236E:												
Eagleview	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
1238E:												
Two Inlets	Very poor.	Poor	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Sugarbush	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1242D:												
Sandberg	Very poor.	Fair	Good	Poor	Poor	---	Very poor.	Very poor.	Fair	Poor	Very poor.	---
Arvilla	Poor	Fair	Fair	Fair	Fair	Poor	Very poor.	Very poor.	Fair	Fair	Very poor.	Poor.
1243B:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1243C:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1243E:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1244B:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Sugarbush	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
1244C:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Sugarbush	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
1244E:												
Sol	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Sugarbush	Very poor.	Poor	Good	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
1246:												
Winger	Good	Good	Fair	Fair	Fair	Good	Good	Good	Good	Fair	Good	Good.
1247D:												
Corliss	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Dorset	Poor	Poor	Fair	Fair	Fair	---	Very poor.	Very poor.	Poor	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1248C:												
Nymore	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Poor	Fair	Very poor.	---
Verndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
1249C:												
Graycalm	Poor	Poor	Fair	Good	Good	---	Very poor.	Very poor.	Poor	Good	Very poor.	---
Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1250C:												
Abbeylake	Poor	Fair	Fair	Poor	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Verndale	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Poor	---
1251:												
Lamoure	Very poor.	Poor	Fair	Good	Good	Fair	Fair	Fair	Poor	Good	Fair	Fair.
1252B:												
Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
1263C:												
Eagleview	Poor	Fair	Fair	Fair	Fair	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
Bootlake	Fair	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1291:												
Sedgeville	Very poor.	Poor	Poor	Fair	Fair	---	Good	Good	Poor	Fair	Good	---
1306:												
Karlstad	Poor	Fair	Fair	Fair	Fair	---	Poor	Very poor.	Poor	Fair	Very poor.	---
1317:												
Vallers	Fair	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good	Fair.
1318:												
Darnen	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good.
1319B:												
Rockwood	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1319C:												
Rockwood	Fair	Good	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 herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
1319D:												
Rockwood--------	Poor	Fair	Good	Good	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
1320B:												
Blowers---------	Good	Good	Good	Good	Good	---	Poor	Very poor.	Good	Good	Very poor.	---
1321:												
Paddock---------	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
1365:												
Hillview--------	Fair	Good	Good	Good	Good	---	Fair	Fair	Fair	Good	Fair	---
1825B:												
Seelyeville-----	Poor	Poor	Poor	Poor	Poor	---	Good	Fair	Poor	Poor	Fair	---
1878:												
Hamre-----------	Fair	Fair	Poor	Poor	Poor	Poor	Good	Good	Fair	Poor	Good	Poor.
1938:												
Lakepark--------	Good	Good	Good	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Fair.
1942:												
Forada----------	Poor	Poor	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good	Poor.
1967:												
Hamerly---------	Good	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
Vallers---------	Fair	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good	Fair.
1975:												
Oylen-----------	Good	Good	Good	Good	Good	---	Fair	Fair	Good	Good	Fair	---
1997:												
Vallers---------	Fair	Fair	Fair	Fair	Poor	Fair	Good	Good	Fair	Fair	Good	Fair.
Hamerly---------	Good	Good	Good	Good	Good	Fair	Fair	Fair	Good	Good	Fair	Fair.
Winger----------	Fair	Fair	Fair	Poor	Poor	Fair	Good	Good	Fair	Poor	Good	---

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 this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil 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 kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind 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 "Sanitary Facilities" 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 "Sanitary Facilities" 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 type 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 "Construction Materials," 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 "Construction Materials," 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 "Water Management," 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)

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
20B: Chapett	Slight	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
20C2: Chapett	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
20E: Chapett	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
26: Aazdahl	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
33B: Barnes	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
36: Flom	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness, frost action.	Severe: wetness.
38B: Waukon	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
38C: Waukon	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
38E: Waukon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
40B: Nebish	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
40C: Nebish	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
40E: Nebish	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	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
47: Colvin	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, frost action.	Moderate: wetness.
63: Rockwell	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
108: McIntosh	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: low strength, frost action.	Slight.
111: Hangaard	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
121: Wykeham	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Slight.
125: Beltrami	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
133A: Dalbo	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
133B: Dalbo	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
133C: Dalbo	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
133E: Dalbo	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
137: Dovray	Severe: ponding.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: ponding, shrink-swell.	Severe: shrink-swell, low strength, ponding.	Severe: ponding, too clayey.
141B: Egeland	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.

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
141C: Egeland	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
168B: Forman	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
168C2: Forman	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, low strength, slope.	Moderate: slope.
168D2: Forman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
168E: Forman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
171B: Formdale	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.	Severe: low strength.	Slight.
180: Gonvick	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
184: Hamerly	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Slight.
191: Epoufette	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
202: Meehan	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness, frost action.	Severe: too acid.
207D: Nymore	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
267B: Snellman	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
267C: Snellman	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, 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
267E: Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
315A: Bootlake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
315B: Bootlake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
332B: Sugarbush	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
335: Urness	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: low strength, ponding, frost action.	Severe: ponding.
339: Fordville	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Slight.
344: Quam	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
351: Colvin	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
375: Forada	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
398: Winger	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
406A: Dorset	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
406B: Dorset	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
413: Osakis	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Moderate: droughty.

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
418: Lamoure	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness.
422B: Bygland	Moderate: too clayey, wetness.	Severe: shrink-swell.	Moderate: wetness, shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
422C: Bygland	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Moderate: wetness, slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
503B: Balmlake	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
503C: Balmlake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
503E: Balmlake	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
508: Wyndmere	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
540: 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.
541: Rifle	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, excess humus.
544: Cathro	Severe: excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
564: Friendship	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
567A: Verndale	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.

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
567B:						
Verndale	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
579C2:						
Formdale	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Langhei	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Sandberg	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty.
624:						
Rosy	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Slight.
701:						
Runeberg	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
711B:						
Arvilla	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Sandberg	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones, droughty.
711C:						
Arvilla	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Sandberg	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty.
718B:						
Naytahwaush	Moderate: too clayey.	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
718C:						
Naytahwaush	Moderate: too clayey, slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
718E:						
Naytahwaush	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
721E:						
Corliss	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
746:						
Haslie----------	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action.	Severe: ponding, excess humus.
747B:						
Audubon---------	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
753D:						
Abbeylake-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
753E:						
Abbeylake-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
765:						
Smiley----------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
767:						
Auganaush-------	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
775B:						
Sugarbush-------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
Two Inlets------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: small stones, droughty.
775C:						
Sugarbush-------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Two Inlets------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty, slope.
776B:						
Snellman--------	Slight---------	Moderate: shrink-swell.	Slight---------	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
Sugarbush-------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
776C:						
Snellman--------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, 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
776C:						
Sugarbush	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
776E:						
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sugarbush	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
778B:						
Dorset	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Corliss	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
778C:						
Dorset	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Corliss	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
780B:						
Audubon	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
Boyerlake	Moderate: too clayey, wetness.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.	Slight.
780C2:						
Audubon	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
Boyerlake	Moderate: too clayey, wetness, slope.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.	Moderate: slope.
780D2:						
Audubon	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	Severe: slope.
Boyerlake	Severe: slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength, slope.	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
785:						
Hamerly	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
Winger	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
786:						
Winger	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
Hamerly	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
Colvin	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
797:						
Mooselake	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action.	Severe: ponding, excess humus.
Lupton	Severe: excess humus, wetness.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness, frost action.	Severe: wetness, excess humus.
867B:						
Graycalm	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
Menahga	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
867C:						
Graycalm	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
Menahga	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
867E:						
Graycalm	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Menahga	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
903B:						
Barnes	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
Langhei	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	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
903C2:						
Barnes	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Langhei	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
931C2:						
Formdale	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Severe: low strength.	Moderate: slope.
Langhei	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
942D2:						
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Barnes	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
943D2:						
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Formdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
943E:						
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Formdale	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
951B:						
Nebish	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Sugarbush	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
951C:						
Nebish	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
Sugarbush	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: 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
951E:						
Nebish	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Sugarbush	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1015:						
Udipsamments	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty, too sandy.
1016:						
Udorthents	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1027:						
Udorthents.						
1030:						
Pits.						
Udipsamments	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1104B:						
Waukon	Slight	Slight	Slight	Moderate: slope.	Moderate: low strength, frost action.	Slight.
Dorset	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
1104C:						
Waukon	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: low strength, slope, frost action.	Moderate: slope.
Dorset	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1111:						
Nidaros	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.
1113:						
Haslie	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.
Seelyeville	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, low strength.	Severe: ponding, frost action.	Severe: ponding, excess humus.

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
1113:						
Cathro	Severe: excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
1125B:						
Sverdrup	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Abbeylake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
1125C:						
Sverdrup	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Abbeylake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
1126B:						
Verndale	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Nymore	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
1127A:						
Bootlake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.
Graycalm	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
1127B:						
Bootlake	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Graycalm	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Severe: droughty.
1128:						
Cathro	Severe: cutbanks cave, excess humus, ponding.				Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
1129:						
Lindaas	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, frost action.	Moderate: wetness.
1130:						
Wolverton	Severe: cutbanks cave.	Slight	Moderate: wetness, shrink-swell.	Slight	Moderate: frost action.	Slight.
1131B:						
Verndale	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: droughty.

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
1131B:						
Abbeylake	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
1132B:						
Eagleview	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Balmlake	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
1132C:						
Eagleview	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Balmlake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
1132E:						
Eagleview	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Balmlake	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1135:						
Foxlake	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: shrink-swell, low strength, wetness.	Severe: wetness.
1136:						
Nidaros	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.
1137B:						
Birchlake	Moderate: too clayey, wetness.	Moderate: shrink-swell.	Moderate: wetness, shrink-swell.	Moderate: shrink-swell.	Severe: low strength, frost action.	Slight.
1137C:						
Birchlake	Moderate: too clayey, wetness, slope.	Moderate: shrink-swell, slope.	Moderate: wetness, slope, shrink-swell.	Severe: slope.	Severe: low strength, frost action.	Moderate: slope.
1137D:						
Birchlake	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope, frost action.	Severe: slope.
1137E:						
Birchlake	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
1138:						
Rushlake	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Severe: droughty.
Hangaard	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
1140B:						
Eagleview	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Snellman	Slight	Moderate: shrink-swell.	Slight	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
1140C:						
Eagleview	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Snellman	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, slope.
1149:						
Hamerly	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
1195B:						
Sybil	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Eagleview	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
1195C:						
Sybil	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Eagleview	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1195E:						
Sybil	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Eagleview	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1196B:						
Lida	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: large stones, droughty.

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
1196B:						
Two Inlets	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones, droughty.
1196C:						
Lida	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: large stones, droughty, slope.
Two Inlets	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: small stones, droughty, slope.
1196E:						
Lida	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Two Inlets	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1200:						
Egglake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1201C:						
Sugarbush	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Snellman	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, slope.
1201E:						
Sugarbush	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1210:						
Paddock	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: large stones, wetness.
Epoufette	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1211:						
Egglake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: 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
1211:						
Cathro	Severe: excess humus, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding.	Severe: subsides, ponding, frost action.	Severe: ponding, excess humus.
1225:						
Wykeham	Moderate: wetness.	Moderate: shrink-swell.	Moderate: wetness.	Moderate: shrink-swell.	Moderate: shrink-swell, frost action.	Slight.
Karlstad	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Moderate: droughty.
1227:						
Quam	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: low strength, ponding, frost action.	Severe: ponding.
Cathro	Severe: excess humus, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
Urness	Severe: excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: low strength, ponding, frost action.	Severe: ponding.
1230:						
Haslie	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.
Nidaros	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.
1234B:						
Formdale	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Buse	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
1235B:						
Formdale	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Severe: low strength.	Slight.
Buse	Slight	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, low strength.	Slight.
Sandberg	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: small stones, droughty.

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
1236B:						
Eagleview-------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
1236C:						
Eagleview-------	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1236E:						
Eagleview-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1238E:						
Two Inlets------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sugarbush-------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1242D:						
Sandberg--------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Arvilla---------	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1243B:						
Sol-------------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
1243C:						
Sol-------------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, slope.
1243E:						
Sol-------------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1244B:						
Sol-------------	Slight---------	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell, frost action.	Moderate: large stones.
Sugarbush-------	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: droughty.
1244C:						
Sol-------------	Moderate: slope.	Moderate: shrink-swell, slope.	Moderate: slope, shrink-swell.	Severe: slope.	Moderate: shrink-swell, slope, frost action.	Moderate: large stones, 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
1244C:						
Sugarbush	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1244E:						
Sol	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sugarbush	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1246:						
Winger	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: wetness.
1247D:						
Corliss	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: droughty, slope.
Dorset	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1248C:						
Nymore	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
Verndale	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1249C:						
Graycalm	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
Bootlake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1250C:						
Abbeylake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Severe: droughty.
Verndale	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1251:						
Lamoure	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
1252B:						
Bootlake	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.
Eagleview	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: droughty.

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
1263C:						
Eagleview	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
Bootlake	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: droughty, slope.
1291:						
Sedgeville	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding, frost action.	Severe: ponding, flooding.
1306:						
Karlstad	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Moderate: frost action.	Moderate: droughty.
1317:						
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1318:						
Darnen	Slight	Slight	Moderate: shrink-swell.	Slight	Moderate: frost action.	Slight.
1319B:						
Rockwood	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Moderate: large stones.
1319C:						
Rockwood	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: large stones, slope.
1319D:						
Rockwood	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
1320B:						
Blowers	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: large stones.
1321:						
Paddock	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: frost action.	Moderate: large stones, wetness.
1365:						
Hillview	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1825B:						
Seelyeville	Severe: excess humus, wetness.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness, low strength.	Severe: subsides, wetness.	Severe: subsides, wetness, frost action.	Severe: wetness, excess humus.

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
1878:						
Hamre	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding, excess humus.
1938:						
Lakepark	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1942:						
Forada	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.
1967:						
Hamerly	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
1975:						
Oylen	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Moderate: droughty.
1997:						
Vallers	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Hamerly	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: wetness.	Moderate: wetness, shrink-swell.	Severe: frost action.	Slight.
Winger	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding, frost action.	Severe: ponding.

SANITARY FACILITIES

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
20B:					
Chapett	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
20C2:					
Chapett	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
20E:					
Chapett	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
26:					
Aazdahl	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
33B:					
Barnes	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
36:					
Flom	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
38B:					
Waukon	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
38C:					
Waukon	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
38E:					
Waukon	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
40B:					
Nebish	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
40C:					
Nebish	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
40E:					
Nebish	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
47: Colvin	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
63: Rockwell	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Poor: wetness.
108: McIntosh	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
111: Hangaard	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
121: Wykeham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
125: Beltrami	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
133A: Dalbo	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
133B: Dalbo	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
133C: Dalbo	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
133E: Dalbo	Severe: wetness, percs slowly, slope.	Severe: slope, wetness.	Severe: wetness, slope, too clayey.	Severe: wetness, slope.	Poor: too clayey, hard to pack, slope.
137: Dovray	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding, too clayey.	Severe: ponding.	Poor: too clayey, hard to pack, ponding.
141B: Egeland	Slight	Severe: seepage.	Moderate: too sandy.	Severe: seepage.	Poor: seepage.

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
141C:					
Egeland	Moderate: slope.	Severe: seepage, slope.	Moderate: slope, too sandy.	Severe: seepage.	Poor: seepage.
168B:					
Forman	Severe: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
168C2:					
Forman	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
168D2:					
Forman	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
168E:					
Forman	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
171B:					
Formdale	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
180:					
Gonvick	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
184:					
Hamerly	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
191:					
Epoufette	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
202:					
Meehan	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
207D:					
Nymore	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
267B:					
Snellman	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.

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
267C: Snellman	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
267E: Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
315A: Bootlake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
315B: Bootlake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
332B: Sugarbush	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
335: Urness	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
339: Fordville	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
344: Quam	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
351: Colvin	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
375: Forada	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
398: Winger	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
406A: Dorset	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

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
406B:					
Dorset	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
413:					
Osakis	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
418:					
Lamoure	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: hard to pack, wetness.
422B:					
Bygland	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.
422C:					
Bygland	Severe: wetness, percs slowly.	Severe: slope, wetness.	Severe: wetness.	Severe: wetness.	Poor: hard to pack.
503B:					
Balmlake	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too sandy.	Slight	Poor: too sandy.
503C:					
Balmlake	Moderate: percs slowly, slope.	Severe: slope.	Severe: too sandy.	Moderate: slope.	Poor: too sandy.
503E:					
Balmlake	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
508:					
Wyndmere	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy.
540:					
Seelyeville	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
541:					
Rifle	Severe: ponding.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.

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
544:					
Cathro	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
564:					
Friendship	Severe: wetness, poor filter.	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
567A:					
Verndale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
567B:					
Verndale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
579C2:					
Formdale	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Langhei	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Sandberg	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
624:					
Rosy	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.	Severe: wetness.	Poor: too sandy.
701:					
Runeberg	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
711B:					
Arvilla	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Sandberg	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
711C:					
Arvilla	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

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
711C:					
Sandberg	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
718B:					
Naytahwaush	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
718C:					
Naytahwaush	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
718E:					
Naytahwaush	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
721E:					
Corliss	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
746:					
Haslie	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, excess humus.	Severe: seepage, ponding.	Poor: hard to pack, ponding.
747B:					
Audubon	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
753D:					
Abbeylake	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
753E:					
Abbeylake	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
765:					
Smiley	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
767:					
Auganaush	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, 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
775B:					
Sugarbush	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Two Inlets	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
775C:					
Sugarbush	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Two Inlets	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
776B:					
Snellman	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
Sugarbush	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
776C:					
Snellman	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
Sugarbush	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
776E:					
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Sugarbush	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
778B:					
Dorset	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Corliss	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.

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
778C:					
Dorset	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Corliss	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
780B:					
Audubon	Severe: wetness, percs slowly.	Moderate: slope.	Severe: too clayey.	Slight	Poor: too clayey, hard to pack.
Boyerlake	Severe: wetness, percs slowly.	Moderate: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
780C2:					
Audubon	Severe: wetness, percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
Boyerlake	Severe: wetness, percs slowly.	Severe: slope.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack.
780D2:					
Audubon	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
Boyerlake	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: wetness, slope, too clayey.	Severe: wetness, slope.	Poor: too clayey, hard to pack, slope.
785:					
Hamerly	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Winger	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
786:					
Winger	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Hamerly	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Colvin	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: 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
797:					
Mooselake	Severe: ponding.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Lupton	Severe: subsides, wetness, percs slowly.	Severe: seepage, excess humus, wetness.	Severe: seepage, wetness, excess humus.	Severe: seepage, wetness.	Poor: wetness, excess humus.
867B:					
Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Menahga	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
867C:					
Graycalm	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Menahga	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
867E:					
Graycalm	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Menahga	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
903B:					
Barnes	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Langhei	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight	Fair: too clayey.
903C2:					
Barnes	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Langhei	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
931C2:					
Formdale	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, 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
931C2:					
Langhei	Severe: percs slowly.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
942D2:					
Langhei	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Barnes	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
943D2:					
Langhei	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Formdale	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
943E:					
Langhei	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Formdale	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
951B:					
Nebish	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
Sugarbush	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
951C:					
Nebish	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
Sugarbush	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
951E:					
Nebish	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
Sugarbush	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.

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
1015:					
Udipsamments----	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1016:					
Udorthents------	Slight----------	Slight----------	Severe: slope.	Severe: slope.	Poor: slope, thin layer.
1027:					
Udorthents.					
1030:					
Pits.					
Udipsamments----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
1104B:					
Waukon----------	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight----------	Fair: too clayey.
Dorset----------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1104C:					
Waukon----------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope, too clayey.	Moderate: slope.	Fair: too clayey, slope.
Dorset----------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1111:					
Nidaros---------	Severe: subsides, flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
1113:					
Haslie----------	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, too clayey, excess humus.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
Seelyeville-----	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.
Cathro----------	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: 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
1125B:					
Sverdrup	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Abbeylake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1125C:					
Sverdrup	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Abbeylake	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1126B:					
Verndale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Nymore	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1127A:					
Bootlake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1127B:					
Bootlake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Graycalm	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1128:					
Cathro	Severe: ponding, percs slowly, poor filter.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.
1129:					
Lindaas	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1130:					
Wolverton	Severe: wetness, percs slowly, poor filter.	Severe: seepage, wetness.	Severe: wetness.	Severe: seepage, wetness.	Fair: too clayey, 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
1131B:					
Verndale	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Abbeylake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1132B:					
Eagleview	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Balmlake	Moderate: percs slowly.	Moderate: seepage, slope.	Severe: too sandy.	Slight	Poor: too sandy.
1132C:					
Eagleview	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Balmlake	Moderate: percs slowly, slope.	Severe: slope.	Severe: too sandy.	Moderate: slope.	Poor: too sandy.
1132E:					
Eagleview	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Balmlake	Severe: slope.	Severe: slope.	Severe: slope, too sandy.	Severe: slope.	Poor: too sandy, slope.
1135:					
Foxlake	Severe: wetness, percs slowly.	Slight	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, wetness.
1136:					
Nidaros	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
1137B:					
Birchlake	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness, too clayey.	Moderate: wetness.	Poor: hard to pack.
1137C:					
Birchlake	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope, too clayey.	Moderate: wetness, slope.	Poor: hard to pack.

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
1137D:					
Birchlake	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: hard to pack, slope.
1137E:					
Birchlake	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: hard to pack, slope.
1138:					
Rushlake	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
Hangaard	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
1140B:					
Eagleview	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Snellman	Moderate: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Fair: small stones.
1140C:					
Eagleview	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Snellman	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
1149:					
Hamerly	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
1195B:					
Sybil	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Eagleview	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1195C:					
Sybil	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, 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
1195C:					
Eagleview-------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1195E:					
Sybil-----------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
Eagleview-------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
1196B:					
Lida------------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Two Inlets------	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1196C:					
Lida------------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Two Inlets------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1196E:					
Lida------------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Two Inlets------	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1200:					
Egglake---------	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1201C:					
Sugarbush-------	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Snellman--------	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, 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
1201E:					
Sugarbush	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Snellman	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
1210:					
Paddock	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Epoufette	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
1211:					
Egglake	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cathro	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
1225:					
Wykeham	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
Karlstad	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
1227:					
Quam	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
Cathro	Severe: ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding.	Severe: seepage, ponding.	Poor: ponding.
Urness	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
1230:					
Haslie	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: ponding, too clayey, excess humus.	Severe: seepage, ponding.	Poor: too clayey, hard to pack, ponding.
Nidaros	Severe: subsides, ponding, percs slowly.	Severe: seepage, excess humus, ponding.	Severe: seepage, ponding, excess humus.	Severe: seepage, ponding.	Poor: ponding, excess humus.

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
1234B:					
Formdale	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Buse	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
1235B:					
Formdale	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Buse	Severe: percs slowly.	Moderate: slope.	Moderate: too clayey.	Slight	Fair: too clayey.
Sandberg	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1236B:					
Eagleview	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1236C:					
Eagleview	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1236E:					
Eagleview	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
1238E:					
Two Inlets	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Sugarbush	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1242D:					
Sandberg	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Arvilla	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1243B:					
Sol	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Fair: small stones.

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
1243C:					
Sol	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
1243E:					
Sol	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
1244B:					
Sol	Moderate: percs slowly.	Severe: seepage.	Slight	Slight	Fair: small stones.
Sugarbush	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1244C:					
Sol	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
Sugarbush	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
1244E:					
Sol	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: slope.	Poor: slope.
Sugarbush	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1246:					
Winger	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1247D:					
Corliss	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Dorset	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
1248C:					
Nymore	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, 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
1248C:					
Verndale	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1249C:					
Graycalm	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bootlake	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1250C:					
Abbeylake	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Verndale	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1251:					
Lamoure	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
1252B:					
Bootlake	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Eagleview	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1263C:					
Eagleview	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Bootlake	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
1291:					
Sedgeville	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, small stones.
1306:					
Karlstad	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.

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
1317:					
Vallers	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1318:					
Darnen	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight	Fair: too clayey.
1319B:					
Rockwood	Severe: percs slowly.	Moderate: seepage, slope.	Slight	Slight	Good.
1319C:					
Rockwood	Severe: percs slowly.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
1319D:					
Rockwood	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
1320B:					
Blowers	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Moderate: wetness, too sandy.	Moderate: wetness.	Fair: too sandy, small stones, wetness.
1321:					
Paddock	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1365:					
Hillview	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
1825B:					
Seelyeville	Severe: subsides, wetness, percs slowly.	Severe: seepage, excess humus.	Severe: seepage, wetness, excess humus.	Severe: seepage, wetness.	Poor: wetness, excess humus.
1878:					
Hamre	Severe: ponding, percs slowly.	Severe: excess humus, ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.
1938:					
Lakepark	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1942:					
Forada	Severe: ponding, poor filter.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, 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
1967:					
Hamerly	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Vallers	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
1975:					
Oylen	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
1997:					
Vallers	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Hamerly	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
Winger	Severe: ponding, percs slowly.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Poor: ponding.

CONSTRUCTION MATERIALS

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
20B: Chapett	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
20C2: Chapett	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
20E: Chapett	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
26: Aazdahl	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
33B: Barnes	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
36: Flom	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
38B: Waukon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
38C: Waukon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
38E: Waukon	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
40B: Nebish	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
40C: Nebish	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
40E: Nebish	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
47: Colvin	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
63: Rockwell	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
108: McIntosh	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
111: Hangaard	Poor: wetness.	Probable	Improbable: excess fines.	Poor: too sandy, small stones, wetness.
121: Wykeham	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
125: Beltrami	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
133A: Dalbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
133B: Dalbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
133C: Dalbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
133E: Dalbo	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
137: Dovray	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
141B: Egeland	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: small stones.
141C: Egeland	Good	Improbable: thin layer.	Improbable: too sandy.	Fair: small stones, slope.
168B: Forman	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
168C2: Forman	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
168D2: Forman	Fair: shrink-swell, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
168E: Forman	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
171B: Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
180: Gonvick	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
184: Hamerly	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
191: Epoufette	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
202: Meehan	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, too acid.
207D: Nymore	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
267B: Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
267C: Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
267E: Snellman	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
315A: Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
315B: Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
332B: Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
335: Urness	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
339: Fordville	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
344: Quam	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
351: Colvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
375: Forada	Fair: wetness.	Probable	Probable	Poor: small stones.
398: Winger	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
406A: Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
406B: Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
413: Osakis	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
418: Lamoure	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
422B:				
Bygland	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
422C:				
Bygland	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
503B:				
Balmlake	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
503C:				
Balmlake	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
503E:				
Balmlake	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
508:				
Wyndmere	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
540:				
Seelyeville	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
541:				
Rifle	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
544:				
Cathro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
564:				
Friendship	Good	Probable	Improbable: too sandy.	Poor: too sandy.
567A:				
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
567B:				
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
579C2:				
Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Langhei	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
579C2:				
Sandberg	Good	Probable	Probable	Poor: small stones, area reclaim.
624:				
Rosy	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
701:				
Runeberg	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, wetness.
711B:				
Arvilla	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Sandberg	Good	Probable	Probable	Poor: small stones, area reclaim.
711C:				
Arvilla	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Sandberg	Good	Probable	Probable	Poor: small stones, area reclaim.
718B:				
Naytahwaush	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
718C:				
Naytahwaush	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
718E:				
Naytahwaush	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
721E:				
Corliss	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
746:				
Haslie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
747B:				
Audubon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
753D:				
Abbeylake	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
753E:				
Abbeylake	Poor: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
765:				
Smiley	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
767:				
Auganaush	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
775B:				
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Two Inlets	Good	Probable	Probable	Poor: small stones, area reclaim.
775C:				
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Two Inlets	Good	Probable	Probable	Poor: small stones, area reclaim.
776B:				
Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
776C:				
Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
776E:				
Snellman	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
776E:				
Sugarbush	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
778B:				
Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Corliss	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
778C:				
Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Corliss	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
780B:				
Audubon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Boyerlake	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
780C2:				
Audubon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
Boyerlake	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
780D2:				
Audubon	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
Boyerlake	Poor: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, slope.
785:				
Hamerly	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Winger	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
786:				
Winger	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Hamerly	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Colvin	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
797:				
Mooselake	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
Lupton	Poor: wetness, low strength.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
867B:				
Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
Menahga	Good	Probable	Improbable: too sandy.	Poor: too sandy.
867C:				
Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
Menahga	Good	Probable	Improbable: too sandy.	Poor: too sandy.
867E:				
Graycalm	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, small stones, slope.
Menahga	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
903B:				
Barnes	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Langhei	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
903C2:				
Barnes	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
903C2:				
Langhei	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
931C2:				
Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Langhei	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
942D2:				
Langhei	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Barnes	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
943D2:				
Langhei	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
943E:				
Langhei	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Formdale	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
951B:				
Nebish	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
951C:				
Nebish	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
951E:				
Nebish	Fair: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Sugarbush	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1015:				
Udipsamments	Good	Probable	Probable	Poor: too sandy.
1016:				
Udorthents	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
1027:				
Udorthents.				
1030:				
Pits.				
Udipsamments	Poor: slope.	Probable	Probable	Poor: too sandy, slope.
1104B:				
Waukon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1104C:				
Waukon	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones, slope.
Dorset	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1111:				
Nidaros	Poor: wetness.	Probable	Probable	Poor: excess humus, wetness.
1113:				
Haslie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Seelyeville	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1113:				
Cathro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
1125B:				
Sverdrup	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Abbeylake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1125C:				
Sverdrup	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Abbeylake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1126B:				
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Nymore	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1127A:				
Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
1127B:				
Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
1128:				
Cathro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
1129:				
Lindaas	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
1130:				
Wolverton	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.
1131B:				
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Abbeylake	Good	Probable	Improbable: too sandy.	Poor: too sandy.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1132B:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Balmlake	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
1132C:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Balmlake	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
1132E:				
Eagleview	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Balmlake	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, slope.
1135:				
Foxlake	Poor: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1136:				
Nidaros	Poor: wetness.	Probable	Probable	Poor: excess humus, wetness.
1137B:				
Birchlake	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
1137C:				
Birchlake	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer.
1137D:				
Birchlake	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
1137E:				
Birchlake	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, slope.
1138:				
Rushlake	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Hangaard	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, wetness.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1140B:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1140C:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1149:				
Hamerly	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
1195B:				
Sybil	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1195C:				
Sybil	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1195E:				
Sybil	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
Eagleview	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
1196B:				
Lida	Good	Probable	Probable	Poor: small stones, area reclaim.
Two Inlets	Good	Probable	Probable	Poor: small stones, area reclaim.
1196C:				
Lida	Good	Probable	Probable	Poor: small stones, area reclaim.
Two Inlets	Good	Probable	Probable	Poor: small stones, area reclaim.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1196E:				
Lida	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Two Inlets	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
1200:				
Egglake	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1201C:				
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Snellman	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1201E:				
Sugarbush	Poor: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
Snellman	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
1210:				
Paddock	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Epoufette	Poor: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1211:				
Egglake	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cathro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
1225:				
Wykeham	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Karlstad	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1227:				
Quam	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1227:				
Cathro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
Urness	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1230:				
Haslie	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
Nidaros	Poor: wetness.	Probable	Probable	Poor: excess humus, wetness.
1234B:				
Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Buse	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
1235B:				
Formdale	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Buse	Fair: shrink-swell, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey, small stones.
Sandberg	Good	Probable	Probable	Poor: small stones, area reclaim.
1236B:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1236C:				
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1236E:				
Eagleview	Fair: slope.	Probable	Improbable: too sandy.	Poor: too sandy, slope.
1238E:				
Two Inlets	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Sugarbush	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1242D:				
Sandberg	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim, slope.
Arvilla	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1243B:				
Sol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1243C:				
Sol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1243E:				
Sol	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
1244B:				
Sol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1244C:				
Sol	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Sugarbush	Good	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1244E:				
Sol	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Sugarbush	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1246:				
Winger	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
1247D:				
Corliss	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1247D: Dorset	Fair: slope.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1248C: Nymore	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1249C: Graycalm	Good	Probable	Improbable: too sandy.	Poor: too sandy, small stones.
Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1250C: Abbeylake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Verndale	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1251: Lamoure	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1252B: Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1263C: Eagleview	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Bootlake	Good	Probable	Improbable: too sandy.	Poor: too sandy.
1291: Sedgeville	Poor: wetness.	Probable	Probable	Poor: small stones, area reclaim, wetness.
1306: Karlstad	Fair: wetness.	Probable	Probable	Poor: too sandy, small stones, area reclaim.
1317: Vallers	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1318:				
Darnen	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
1319B:				
Rockwood	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
1319C:				
Rockwood	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
1319D:				
Rockwood	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
1320B:				
Blowers	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1321:				
Paddock	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
1365:				
Hillview	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1825B:				
Seelyeville	Poor: wetness.	Improbable: excess humus.	Improbable: excess humus.	Poor: excess humus, wetness.
1878:				
Hamre	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1938:				
Lakepark	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1942:				
Forada	Poor: wetness.	Probable	Probable	Poor: small stones, wetness.
1967:				
Hamerly	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Vallers	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
1975:				
Oylen	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.

CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
1997:				
Vallers	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Hamerly	Fair: shrink-swell, low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
Winger	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.

WATER MANAGEMENT

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

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
20B: Chapett	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Soil blowing	Rooting depth.
20C2: Chapett	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
20E: Chapett	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
26: Aazdahl	Slight	Moderate: wetness.	Severe: slow refill.	Deep to water	Favorable	Erodes easily	Erodes easily.
33B: Barnes	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
36: Flom	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
38B: Waukon	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
38C: Waukon	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
38E: Waukon	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
40B: Nebish	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	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
40C: Nebish	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
40E: Nebish	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
47: Colvin	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Wetness	Wetness	Wetness.
63: Rockwell	Severe: seepage.	Severe: piping, wetness.	Severe: slow refill, cutbanks cave.	Frost action	Wetness	Wetness	Wetness.
108: McIntosh	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
111: Hangaard	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Wetness, droughty.
121: Wykeham	Moderate: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Favorable	Wetness, soil blowing.	Wetness, soil blowing.	Rooting depth.
125: Beltrami	Moderate: seepage.	Severe: piping.	Severe: slow refill, cutbanks cave.	Frost action	Wetness	Wetness	Favorable.
133A: Dalbo	Moderate: seepage.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness	Erodes easily, wetness.	Erodes easily, percs slowly.
133B: Dalbo	Moderate: seepage, slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
133C: Dalbo	Severe: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.

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
133E:							
Dalbo	Severe: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
137:							
Dovray	Slight	Severe: hard to pack, ponding.	Severe: slow refill.	Ponding, percs slowly.	Ponding, slow intake, percs slowly.	Erodes easily, ponding, percs slowly.	Wetness, erodes easily, percs slowly.
141B:							
Egeland	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
141C:							
Egeland	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
168B:							
Forman	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
168C2:							
Forman	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
168D2:							
Forman	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
168E:							
Forman	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
171B:							
Formdale	Moderate: slope.	Slight	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
180:							
Gonvick	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Wetness	Favorable.
184:							
Hamerly	Moderate: seepage.	Severe: piping.	Moderate: deep to water, slow refill.	Frost action	Wetness	Erodes easily, wetness.	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
191: Epoufette	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
202: Meehan	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, too acid.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
207D: Nymore	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
267B: Snellman	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Soil blowing	Rooting depth.
267C: Snellman	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
267E: Snellman	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
315A: Bootlake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty	Too sandy, soil blowing.	Droughty.
315B: Bootlake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
332B: Sugarbush	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
335: Urness	Moderate: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	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
339:							
Fordville-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Rooting depth	Too sandy------	Rooting depth.
344:							
Quam----------	Slight---------	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding--------	Erodes easily, ponding.	Wetness, erodes easily.
351:							
Colvin----------	Moderate: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
375:							
Forada----------	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness--------	Wetness, too sandy.	Wetness.
398:							
Winger----------	Moderate: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding--------	Ponding--------	Wetness.
406A:							
Dorset----------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
406B:							
Dorset----------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
413:							
Osakis----------	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Droughty.
418:							
Lamoure---------	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
422B:							
Bygland---------	Moderate: slope.	Moderate: piping, hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.

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
422C: Bygland	Severe: slope.	Moderate: piping, hard to pack, wetness.	Severe: slow refill.	Percs slowly, frost action, slope.	Slope, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
503B: Balmlake	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Erodes easily, too sandy.	Erodes easily.
503C: Balmlake	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, erodes easily, too sandy.	Slope, erodes easily.
503E: Balmlake	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, erodes easily, too sandy.	Slope, erodes easily.
508: Wyndmere	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, soil blowing.	Wetness, too sandy, soil blowing.	Favorable.
540: Seelyeville	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
541: Rifle	Severe: seepage.	Severe: excess humus, ponding.	Moderate: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
544: Cathro	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
564: Friendship	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	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
567A:							
Verndale	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
567B:							
Verndale	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
579C2:							
Formdale	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Langhei	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Sandberg	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
624:							
Rosy	Moderate: seepage.	Severe: piping.	Severe: cutbanks cave.	Deep to water	Soil blowing	Too sandy, soil blowing.	Favorable.
701:							
Runeberg	Slight	Severe: piping, ponding.	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, rooting depth, percs slowly.
711B:							
Arvilla	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
Sandberg	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
711C:							
Arvilla	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
Sandberg	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	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
718B: Naytahwaush-----	Moderate: slope.	Slight---------	Severe: no water.	Deep to water	Slope, percs slowly.	Erodes easily	Erodes easily, percs slowly.
718C: Naytahwaush-----	Severe: slope.	Slight---------	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, erodes easily.	Slope, erodes easily, percs slowly.
718E: Naytahwaush-----	Severe: slope.	Slight---------	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, erodes easily.	Slope, erodes easily, percs slowly.
721E: Corliss---------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
746: Haslie----------	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, percs slowly, subsides.	Ponding, soil blowing, percs slowly.	Ponding, soil blowing, percs slowly.	Wetness, percs slowly.
747B: Audubon---------	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
753D: Abbeylake-------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
753E: Abbeylake-------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
765: Smiley----------	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action---	Wetness--------	Wetness--------	Wetness.
767: Auganaush-------	Slight---------	Severe: wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.

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
775B:							
Sugarbush-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
Two Inlets------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty, rooting depth.
775C:							
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Two Inlets------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
776B:							
Snellman--------	Moderate: seepage, slope.	Slight---------	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Soil blowing---	Rooting depth.
Sugarbush-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
776C:							
Snellman--------	Severe: slope.	Slight---------	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
776E:							
Snellman--------	Severe: slope.	Slight---------	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
778B:							
Dorset----------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, 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
778B: Corliss	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
778C: Dorset	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
Corliss	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
780B: Audubon	Moderate: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly.	Erodes easily, percs slowly.	Erodes easily, percs slowly.
Boyerlake	Moderate: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Slope, wetness.	Erodes easily, wetness.	Erodes easily, percs slowly.
780C2: Audubon	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Boyerlake	Severe: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Slope, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
780D2: Audubon	Severe: slope.	Moderate: hard to pack.	Severe: no water.	Deep to water	Slope, percs slowly.	Slope, erodes easily, percs slowly.	Slope, erodes easily, percs slowly.
Boyerlake	Severe: slope.	Moderate: hard to pack, wetness.	Severe: slow refill.	Percs slowly, slope.	Slope, wetness.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
785: Hamerly	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
Winger	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Wetness	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
786:							
Winger	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Wetness	Wetness.
Hamerly	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
Colvin	Moderate: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, percs slowly, frost action.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
797:							
Mooselake	Severe: seepage.	Severe: excess humus, ponding.	Moderate: slow refill.	Ponding, subsides.	Ponding	Ponding	Wetness.
Lupton	Severe: seepage.	Severe: excess humus, wetness.	Severe: slow refill.	Subsides, frost action.	Wetness, soil blowing.	Wetness, soil blowing.	Wetness.
867B:							
Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Menahga	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
867C:							
Graycalm	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Menahga	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
867E:							
Graycalm	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Menahga	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	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
903B:							
Barnes	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
Langhei	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	Favorable.
903C2:							
Barnes	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Langhei	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
931C2:							
Formdale	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Langhei	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
942D2:							
Langhei	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Barnes	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
943D2:							
Langhei	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Formdale	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
943E:							
Langhei	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
Formdale	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope	Slope, erodes easily.	Slope, erodes easily.
951B:							
Nebish	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Favorable	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
951B:							
Sugarbush-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
951C:							
Nebish----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Slope----------	Slope.
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
951E:							
Nebish----------	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope----------	Slope----------	Slope.
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1015:							
Udipsamments----	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1016:							
Udorthents------	Slight---------	Slight---------	Severe: no water.	Deep to water	Slope----------	Slope----------	Slope.
1027:							
Udorthents.							
1030:							
Pits.							
Udipsamments----	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1104B:							
Waukon----------	Moderate: seepage, slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope----------	Favorable------	Favorable.
Dorset----------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, 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
1104C:							
Waukon	Severe: slope.	Moderate: piping.	Severe: no water.	Deep to water	Slope	Slope	Slope.
Dorset	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
1111:							
Nidaros	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, subsides.	Ponding, soil blowing, rooting depth.	Ponding, soil blowing.	Wetness, rooting depth.
1113:							
Haslie	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, percs slowly, subsides.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
Seelyeville	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
Cathro	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
1125B:							
Sverdrup	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
Abbeylake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1125C:							
Sverdrup	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
Abbeylake	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1126B:							
Verndale	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, 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
1126B:							
Nymore	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1127A:							
Bootlake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty	Too sandy, soil blowing.	Droughty.
Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1127B:							
Bootlake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
Graycalm	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1128:							
Cathro	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, too sandy, soil blowing.	Wetness.
1129:							
Lindaas	Slight	Severe: piping, wetness.	Severe: slow refill.	Percs slowly, frost action.	Wetness, percs slowly.	Wetness	Wetness, percs slowly.
1130:							
Wolverton	Severe: seepage.	Moderate: piping, wetness.	Severe: slow refill, cutbanks cave.	Favorable	Wetness	Wetness, soil blowing.	Favorable.
1131B:							
Verndale	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
Abbeylake	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	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
1132B:							
Eagleview	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Balmlake	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Erodes easily, too sandy.	Erodes easily.
1132C:							
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Balmlake	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, erodes easily, too sandy.	Slope, erodes easily.
1132E:							
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Balmlake	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing.	Slope, erodes easily, too sandy.	Slope, erodes easily.
1135:							
Foxlake	Slight	Severe: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
1136:							
Nidaros	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, soil blowing, rooting depth.	Ponding, too sandy, soil blowing.	Wetness, rooting depth.
1137B:							
Birchlake	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.
1137C:							
Birchlake	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.

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
1137D:							
Birchlake	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
1137E:							
Birchlake	Severe: slope.	Moderate: hard to pack, wetness.	Severe: no water.	Percs slowly, frost action, slope.	Slope, wetness, percs slowly.	Slope, erodes easily, wetness.	Slope, erodes easily, percs slowly.
1138:							
Rushlake	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Wetness, too sandy, soil blowing.	Droughty.
Hangaard	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Wetness, droughty.
1140B:							
Eagleview	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Snellman	Moderate: seepage, slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Soil blowing	Rooting depth.
1140C:							
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Snellman	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
1149:							
Hamerly	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
1195B:							
Sybil	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Eagleview	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	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
1195C:							
Sybil	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1195E:							
Sybil	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1196B:							
Lida	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
Two Inlets	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
1196C:							
Lida	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Two Inlets	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1196E:							
Lida	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Two Inlets	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1200:							
Egglake	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action	Wetness, rooting depth.	Wetness	Wetness, 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
1201C:							
Sugarbush	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Snellman	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
1201E:							
Sugarbush	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Snellman	Severe: slope.	Slight	Severe: no water.	Deep to water	Slope, soil blowing, rooting depth.	Slope, soil blowing.	Slope, rooting depth.
1210:							
Paddock	Moderate: seepage.	Severe: piping.	Severe: no water.	Frost action	Wetness, soil blowing, percs slowly.	Wetness, soil blowing.	Wetness, rooting depth.
Epoufette	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, droughty.	Wetness, too sandy, soil blowing.	Wetness, droughty.
1211:							
Egglake	Moderate: seepage.	Severe: piping, wetness.	Moderate: slow refill.	Frost action	Wetness, soil blowing, rooting depth.	Wetness, soil blowing.	Wetness, rooting depth.
Cathro	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, subsides, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
1225:							
Wykeham	Moderate: seepage.	Moderate: wetness.	Severe: cutbanks cave.	Favorable	Wetness, soil blowing.	Wetness, soil blowing.	Rooting depth.
Karlstad	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Large stones, wetness, too sandy.	Large stones, 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
1227:							
Quam	Slight	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Erodes easily, ponding.	Wetness, erodes easily.
Cathro	Severe: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
Urness	Moderate: seepage.	Severe: ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.
1230:							
Haslie	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill.	Ponding, percs slowly, subsides.	Ponding, percs slowly.	Ponding, percs slowly.	Wetness, percs slowly.
Nidaros	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill, cutbanks cave.	Ponding, subsides, frost action.	Ponding, rooting depth.	Ponding	Wetness, rooting depth.
1234B:							
Formdale	Moderate: slope.	Slight	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
Buse	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
1235B:							
Formdale	Moderate: slope.	Slight	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
Buse	Moderate: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope	Erodes easily	Erodes easily.
Sandberg	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
1236B:							
Eagleview	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1236C:							
Eagleview	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	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
1236E:							
Eagleview-------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
1238E:							
Two Inlets------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
Sugarbush-------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1242D:							
Sandberg--------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
Arvilla---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
1243B:							
Sol-------------	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Favorable------	Rooting depth.
1243C:							
Sol-------------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope----------	Slope, rooting depth.
1243E:							
Sol-------------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope----------	Slope, rooting depth.
1244B:							
Sol-------------	Moderate: seepage, slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Favorable------	Rooting depth.
Sugarbush-------	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty, rooting depth.
1244C:							
Sol-------------	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope----------	Slope, 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
1244C:							
Sugarbush	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1244E:							
Sol	Severe: slope.	Severe: thin layer.	Severe: no water.	Deep to water	Slope, rooting depth.	Slope	Slope, rooting depth.
Sugarbush	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty, rooting depth.
1246:							
Winger	Moderate: seepage.	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Wetness	Wetness.
1247D:							
Corliss	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Dorset	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
1248C:							
Nymore	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Verndale	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
1249C:							
Graycalm	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Bootlake	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	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
1250C:							
Abbeylake-------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Verndale---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, soil blowing.	Slope, too sandy, soil blowing.	Slope, droughty.
1251:							
Lamoure----------	Moderate: seepage.	Severe: wetness.	Severe: slow refill.	Flooding, frost action.	Wetness, flooding.	Erodes easily, wetness.	Wetness, erodes easily.
1252B:							
Bootlake---------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Too sandy, soil blowing.	Droughty.
Eagleview--------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
1263C:							
Eagleview--------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Slope, too sandy, soil blowing.	Slope, droughty.
Bootlake---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty.	Slope, too sandy, soil blowing.	Slope, droughty.
1291:							
Sedgeville-------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, frost action.	Ponding, flooding.	Ponding, too sandy.	Wetness.
1306:							
Karlstad---------	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Large stones, wetness, too sandy.	Large stones, droughty.
1317:							
Vallers----------	Slight----------	Severe: piping, wetness.	Severe: slow refill.	Frost action---	Wetness--------	Erodes easily, wetness.	Wetness, 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
1318: Darnen	Moderate: seepage.	Severe: piping.	Severe: no water.	Deep to water	Favorable	Favorable	Favorable.
1319B: Rockwood	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Soil blowing	Rooting depth.
1319C: Rockwood	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, soil blowing.	Slope, rooting depth.
1319D: Rockwood	Severe: slope.	Severe: piping.	Severe: no water.	Deep to water	Slope, soil blowing, percs slowly.	Slope, soil blowing.	Slope, rooting depth.
1320B: Blowers	Moderate: seepage, slope.	Severe: piping.	Severe: no water.	Frost action, slope, cutbanks cave.	Slope, wetness, soil blowing.	Wetness, too sandy, soil blowing.	Rooting depth.
1321: Paddock	Moderate: seepage.	Severe: piping.	Severe: no water.	Frost action	Wetness, soil blowing, percs slowly.	Wetness, soil blowing.	Wetness, rooting depth.
1365: Hillview	Severe: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness, soil blowing.	Wetness, too sandy, soil blowing.	Wetness.
1825B: Seelyeville	Severe: seepage.	Severe: excess humus, wetness.	Severe: slow refill.	Subsides, frost action, slope.	Slope, wetness.	Wetness	Wetness.
1878: Hamre	Moderate: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding, soil blowing.	Ponding, soil blowing.	Wetness.
1938: Lakepark	Slight	Severe: wetness.	Severe: slow refill.	Frost action	Wetness	Wetness	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
1942:							
Forada	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, frost action, cutbanks cave.	Ponding	Ponding, too sandy.	Wetness.
1967:							
Hamerly	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
Vallers	Slight	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
1975:							
Oylen	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, soil blowing.	Wetness, too sandy, soil blowing.	Droughty.
1997:							
Vallers	Slight	Severe: piping, wetness.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Wetness, erodes easily.
Hamerly	Moderate: seepage.	Severe: piping.	Severe: slow refill.	Frost action	Wetness	Erodes easily, wetness.	Erodes easily.
Winger	Moderate: seepage.	Severe: piping, ponding.	Severe: slow refill.	Ponding, frost action.	Ponding	Ponding	Wetness.

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 soil classification system (ASTM, 1993) and system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1986).

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 ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

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.

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.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓-bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In the table "Physical Properties of the Soils," 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; and *high*, more than 6 percent. *Very high*, more than 9 percent, is sometimes used.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In the table "Physical Properties of the Soils," 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 Kf indicates the erodibility of the fine-earth fraction, or the material less than 2 millimeters in size.

Erosion factor T is an estimate of the maximum average 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. These soils 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. These soils 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. These soils 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.

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. It is a measurement of the nutrient-holding capacity of the soil.

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 is expressed as a weighted percentage of the fraction of the soil less than 2 millimeters in size. The availability of plant nutrients, such as phosphorus, is affected by the amount of carbonates in the soil.

Salinity is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of the soil if used as construction material, and the potential of the soil to corrode metal and concrete.

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 intake 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 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* that it occurs often under normal weather conditions (the chance of flooding is more than 50 percent 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, 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 "Soil Features" 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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
20B:												
Chapett---------	0-8	Fine sandy loam	SM, SC	A-4, A-2-4	0-1	0-5	95-100	85-95	50-80	30-50	15-20	2-10
	8-23	Sandy clay loam, sandy loam, loam.	ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	55-85	55-70	20-40	8-20
	23-33	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
	33-60	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
20C2:												
Chapett---------	0-9	Fine sandy loam	SM, SC	A-4, A-2-4	0-1	0-5	95-100	85-95	50-80	30-50	15-20	2-10
	9-26	Sandy clay loam, sandy loam, loam.	ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	55-85	55-70	20-40	8-20
	26-43	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
	43-60	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
20E:												
Chapett---------	0-7	Fine sandy loam	SM, SC	A-4, A-2-4	0-1	0-5	95-100	85-95	50-80	30-50	15-20	2-10
	7-20	Sandy clay loam, sandy loam, loam.	ML, CL	A-4, A-6	0-1	0-5	95-100	85-95	55-85	55-70	20-40	8-20
	20-33	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
	33-60	Fine sandy loam, loam, sandy loam.	SC, ML, CL, SM	A-4, A-6	0-1	0-5	95-100	85-95	50-85	35-65	15-30	3-12
26:												
Aazdahl---------	0-13	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	13-19	Clay loam, silty clay loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	19-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
33B:												
Barnes----------	0-7	Loam----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	50-90	20-40	5-20
	7-13	Loam, sandy clay loam.	CL, CL-ML, SC, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	35-80	25-40	5-20
	13-60	Loam----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-40	5-20

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
36:												
Flom	0-16	Silty clay loam	CL	A-7, A-6	0	0	95-100	95-100	90-100	80-95	35-50	15-30
	16-24	Clay loam, silty clay loam, loam.	CL	A-6, A-7	0	0	95-100	95-100	90-100	70-95	30-50	10-30
	24-60	Loam, clay loam	CL	A-6, A-7	0	0	95-100	90-100	80-95	60-90	20-50	10-30
38B:												
Waukon	0-9	Loam	ML, CL, CL-ML	A-6, A-4	0-1	0-3	95-100	90-100	80-95	60-90	20-40	5-20
	9-20	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-3	95-100	90-100	75-95	50-85	30-45	10-20
	20-60	Loam, clay loam	ML, CL	A-6	0-1	0-3	95-100	90-100	70-95	50-80	30-40	10-20
38C:												
Waukon	0-8	Loam	ML, CL, CL-ML	A-6, A-4	0-1	0-3	95-100	90-100	80-95	60-90	20-40	5-20
	8-20	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-3	95-100	90-100	75-95	50-85	30-45	10-20
	20-60	Loam, clay loam	ML, CL	A-6	0-1	0-3	95-100	90-100	70-95	50-80	30-40	10-20
38E:												
Waukon	0-7	Loam	ML, CL, CL-ML	A-6, A-4	0-1	0-3	95-100	90-100	80-95	60-90	20-40	5-20
	7-26	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-3	95-100	90-100	75-95	50-85	30-45	10-20
	26-60	Loam, clay loam	ML, CL	A-6	0-1	0-3	95-100	90-100	70-95	50-80	30-40	10-20
40B:												
Nebish	0-7	Loam	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	7-26	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	26-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20
40C:												
Nebish	0-8	Loam	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	8-26	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	26-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20
40E:												
Nebish	0-9	Loam	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	9-22	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	22-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
47:												
Colvin----------	0-10	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	35-50	15-30
	10-26	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
	26-60	Loam, silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	70-95	25-50	10-25
63:												
Rockwell--------	0-18	Loam----------	OL, ML	A-4	0	0	100	95-100	85-95	50-75	20-40	NP-10
	18-25	Fine sandy loam, sandy loam, loam.	SM, ML, SC-SM, CL-ML	A-4	0	0	100	95-100	60-85	35-55	15-25	1-7
	25-32	Fine sand, sand, loamy fine sand.	SM	A-2	0	0	100	95-100	65-80	20-35	0-14	NP
	32-60	Silt loam, loam, clay loam.	CL, CL-ML, SC, SC-SM	A-6, A-4	0	0-1	95-100	90-100	70-90	40-85	15-40	5-20
108:												
McIntosh--------	0-9	Silt loam------	CL, ML	A-4, A-6	0	0	100	100	85-100	70-95	28-36	9-15
	9-30	Silt loam, silty clay loam, loam.	ML, CL	A-4, A-6	0	0	100	100	90-100	70-90	28-43	9-21
	30-60	Loam, clay loam	CL, ML	A-6, A-4	0	0-5	95-100	90-100	80-95	60-80	28-43	9-21
111:												
Hangaard--------	0-10	Sandy loam-----	SM, SM-SC	A-2	0	0	95-100	92-100	50-75	15-35	---	NP
	10-18	Loamy sand, coarse sandy loam, loamy coarse sand.	SP-SM, SM	A-2	0	0	95-100	92-100	50-75	10-30	---	NP
	18-60	Gravelly coarse sand, gravelly sand, coarse sand.	SM, SP	A-3, A-1, A-2	0	0	85-100	80-100	35-70	2-15	15-20	NP
121:												
Wykeham---------	0-8	Fine sandy loam	SM, SC-SM	A-4	0	0-5	90-100	85-100	65-80	40-50	25-30	2-5
	8-11	Fine sandy loam, loamy sand, sandy loam.	SM, SC-SM	A-4, A-2	0	0-5	85-100	70-95	65-80	25-50	15-20	1-5
	11-21	Loam, sandy clay loam, sandy loam.	SC, CL	A-6	0	0-5	90-100	85-95	70-80	35-60	30-35	10-15
	21-60	Fine sandy loam, sandy loam.	SC-SM, SC	A-4	0	0-5	85-95	85-95	65-80	35-50	20-25	5-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
125:												
Beltrami	0-4	Loam	ML, CL, CL-ML	A-4	0-1	0-3	95-100	85-95	75-95	50-65	20-30	3-10
	4-8	Fine sandy loam, loam, loamy sand.	SM, SC-SM, ML, CL-ML	A-4, A-2	0-1	0-3	95-100	85-95	60-90	25-60	15-25	NP-7
	8-22	Loam, sandy clay loam, clay loam.	CL	A-6, A-7	0-1	0-3	95-100	85-98	75-95	50-85	20-45	10-30
	22-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0-1	1-3	95-100	85-95	70-95	50-80	20-40	5-20
133A:												
Dalbo	0-6	Silt loam	CL, ML, CL-ML	A-4	0	0	100	100	95-100	60-100	20-35	2-10
	6-41	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	95-100	95-100	85-100	40-65	20-40
	41-60	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	95-100	95-100	85-100	30-60	10-35
133B:												
Dalbo	0-7	Silt loam	CL, ML, CL-ML	A-4	0	0	100	100	95-100	60-100	20-35	2-10
	7-21	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	95-100	95-100	85-100	40-65	20-40
	21-60	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	95-100	95-100	85-100	30-60	10-35
133C:												
Dalbo	0-7	Silt loam	CL, ML, CL-ML	A-4	0	0	100	100	95-100	60-100	20-35	2-10
	7-25	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	95-100	95-100	85-100	40-65	20-40
	25-60	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	95-100	95-100	85-100	30-60	10-35
133E:												
Dalbo	0-7	Silt loam	CL, ML, CL-ML	A-4	0	0	100	100	95-100	60-100	20-35	2-10
	7-29	Silty clay, silty clay loam.	CL, CH	A-7	0	0	100	95-100	95-100	85-100	40-65	20-40
	29-60	Silty clay loam, silt loam.	CL, ML	A-6, A-7	0	0	100	95-100	95-100	85-100	30-60	10-35
137:												
Dovray	0-10	Silty clay	CH, MH, OH	A-7	0	0	100	100	95-100	85-95	56-76	33-49
	10-43	Clay, silty clay.	CH, MH	A-7	0	0	100	100	95-100	85-95	56-76	33-49
	43-54	Clay, silty clay.	CH, MH	A-7	0	0	100	100	90-100	85-95	56-76	33-49
	54-60	Clay, silty clay loam, clay loam.	CH, MH, CL	A-7	0	0	100	100	80-100	70-95	41-76	21-49

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
141B:												
Egeland---------	0-9	Fine sandy loam	SM, SC-SM	A-2, A-4	0	0	100	95-100	75-100	30-50	15-25	NP-7
	9-16	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	95-100	85-100	70-100	15-50	15-25	NP-7
	16-60	Stratified fine sand to silt loam.	SM, ML, SC-SM	A-2, A-4	0	0	95-100	85-100	65-90	30-80	15-25	NP-5
141C:												
Egeland---------	0-13	Fine sandy loam	SM, SC-SM	A-2, A-4	0	0	100	95-100	75-100	30-50	15-25	NP-7
	13-22	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0	95-100	85-100	70-100	15-50	15-25	NP-7
	22-60	Stratified fine sand to silt loam.	SM, ML, SC-SM	A-2, A-4	0	0	95-100	85-100	65-90	30-80	15-25	NP-5
168B:												
Forman----------	0-8	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-80	30-45	10-25
	8-15	Clay loam------	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
168C2:												
Forman----------	0-7	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-80	30-45	10-25
	7-16	Clay loam------	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	16-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
168D2:												
Forman----------	0-8	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-80	30-45	10-25
	8-15	Clay loam------	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
168E:												
Forman----------	0-7	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	85-100	70-80	30-45	10-25
	7-15	Clay loam------	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20
	15-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-80	25-45	5-20

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
171B:												
Formdale	0-8	Clay loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	8-14	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	14-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
180:												
Gonvick	0-12	Loam	ML, CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	85-95	50-75	20-40	3-20
	12-34	Loam, clay loam	CL	A-6, A-7	0	0-3	95-100	90-100	75-95	50-85	20-50	10-30
	34-60	Loam, clay loam	CL-ML, CL	A-4, A-6	0	0-3	95-100	90-100	70-95	50-80	15-40	5-20
184:												
Hamerly	0-10	Loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	90-100	80-95	60-90	20-40	5-20
	10-24	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	85-95	80-95	60-75	20-40	5-20
	24-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	85-95	80-95	60-75	20-40	5-20
191:												
Epoufette	0-6	Sandy loam	SM, SC-SM	A-2, A-4	0	0-5	95-100	65-95	60-75	25-40	15-25	NP-7
	6-12	Loamy sand, sand, gravelly loamy sand.	SM, SP, SP-SM	A-2, A-3	0	0-5	95-100	65-95	50-75	0-30	---	NP
	12-20	Gravelly sandy loam, sandy loam, gravelly loamy sand.	SM, SC, SC-SM	A-2, A-4	0	0-5	95-100	70-95	60-80	25-40	15-25	2-10
	20-60	Gravelly sand, coarse sand, sand.	SP, SP-SM, GP, GP-GM	A-1, A-3, A-2-4	0	0-10	50-90	45-85	30-60	0-10	---	NP
202:												
Meehan	0-13	Loamy sand	SM	A-2, A-1	0	0	90-100	75-100	40-90	15-30	0-14	NP
	13-25	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	90-100	75-100	40-90	3-30	0-14	NP
	25-60	Sand, coarse sand.	SP, SP-SM	A-1, A-3, A-2	0	0	90-100	75-100	40-90	0-5	0-14	NP
207D:												
Nymore	0-6	Loamy sand	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	50-75	5-30	15-20	NP
	6-46	Sand, coarse sand, loamy coarse sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-75	2-15	15-20	NP
	46-60	Sand, coarse sand.	SP, SM, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	45-75	2-15	15-20	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
267B:												
Snellman--------	0-2	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	2-16	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	16-31	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	31-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
267C:												
Snellman--------	0-3	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	3-16	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	16-28	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	28-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
267E:												
Snellman--------	0-2	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	2-14	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	14-28	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	28-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
315A:												
Bootlake--------	0-6	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	6-13	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	13-28	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	28-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
315B:												
Bootlake--------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	3-9	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	9-21	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	21-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
332B:												
Sugarbush-------	0-4	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	4-13	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	13-18	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	18-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
335:												
Urness----------	0-7	Mucky silt loam	OL, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-50	3-20
	7-60	Mucky silt loam, mucky silty clay loam, silty clay loam.	ML, CL, CL-ML, OL	A-4, A-6, A-7	0	0	95-100	90-100	85-100	70-95	20-50	3-30
339:												
Fordville-------	0-10	Loam----------	ML, CL	A-4, A-6, A-7	0	0	100	100	70-85	55-75	30-45	5-20
	10-17	Loam, silt loam, clay loam.	CL, ML	A-4, A-6, A-7	0	0	100	95-100	70-95	55-80	30-45	5-20
	17-28	Loam, clay loam, fine sandy loam.	CL, ML, SM, SC	A-4, A-6	0	0	95-100	90-100	65-90	40-55	25-40	3-15
	28-60	Gravelly loamy sand, gravelly sand, very gravelly sand.	SW, SM, SW-SM	A-1	0	0	55-85	50-75	30-55	2-10	15-25	NP-5

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
344:												
Quam----------	0-10	Silty clay loam	CL, ML, OL	A-7	0	0	100	100	90-100	85-95	40-50	15-25
	10-42	Silty clay loam, silt loam, loam.	CL, ML	A-7, A-6, A-4	0	0	100	100	80-100	70-95	30-50	5-25
	42-60	Clay loam, silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	90-100	85-95	70-90	20-50	5-20
351:												
Colvin----------	0-12	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	35-50	15-30
	12-45	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
	45-60	Loam, silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	70-95	25-50	10-25
375:												
Forada----------	0-14	Loam----------	ML	A-4	0	0	95-100	85-100	70-90	50-70	25-35	5-20
	14-22	Sandy loam, loam, fine sandy loam.	ML, SM	A-4, A-2	0	0	95-100	85-100	55-85	30-60	15-30	NP-10
	22-60	Sand, gravelly coarse sand, loamy sand.	SP, SM, SP-SM, GP-GM	A-1, A-2, A-3	0	0	50-100	50-100	40-70	5-30	---	NP
398:												
Winger----------	0-13	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	10-15
	13-37	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-40	2-15
	37-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-10	90-100	85-100	75-95	50-75	20-45	3-25
406A:												
Dorset----------	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	9-21	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	21-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
406B:												
Dorset----------	0-10	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	10-17	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	17-29	Gravelly loamy sand, gravelly loamy coarse sand, gravelly coarse sand.	SP-SM, SM, SC-SM, GM	A-1, A-2	0	0-5	50-90	35-75	20-50	10-25	0-20	NP-7
	29-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM, GP, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
413:												
Osakis----------	0-8	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	95-100	85-100	50-70	25-40	15-25	NP-7
	8-18	Loam, sandy loam.	SM, ML, CL-ML, SC-SM	A-4, A-2	0	0	95-100	85-100	55-90	25-70	20-35	1-8
	18-60	Coarse sand, gravelly coarse sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	55-85	50-75	30-55	2-10	15-20	NP
418:												
Lamoure----------	0-39	Silty clay loam	CL, CH, MH, ML	A-7	0	0	100	100	95-100	85-100	40-70	15-35
	39-60	Stratified sandy loam to silty clay loam.	CL, SC	A-6, A-7	0	0	95-100	95-100	70-95	35-90	30-70	10-35
422B:												
Bygland----------	0-8	Silty clay loam	CL, ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	15-25
	8-22	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0	0	100	100	95-100	85-100	45-70	20-45
	22-38	Silty clay loam, silt loam, silty clay.	CL, CH	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
	38-60	Stratified silty clay loam to silt loam.	CL, CH	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
422C:												
Bygland---------	0-8	Silty clay loam	CL, ML	A-7, A-6	0	0	100	100	95-100	95-100	35-50	15-25
	8-16	Silty clay, clay, silty clay loam.	CH, CL, MH	A-7	0	0	100	100	95-100	85-100	45-70	20-45
	16-25	Silty clay loam, silt loam, silty clay.	CL, CH	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
	25-60	Stratified silty clay loam to silt loam.	CL, CH	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
503B:												
Balmlake---------	0-3	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	3-20	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	20-28	Fine sandy loam, sandy loam, loam.	SM, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	28-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5
503C:												
Balmlake---------	0-2	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	2-17	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	17-29	Fine sandy loam, sandy loam, loam.	SM, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	29-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5
503E:												
Balmlake---------	0-2	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	2-15	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	15-28	Fine sandy loam, sandy loam, loam.	SM, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	28-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
508:												
Wyndmere--------	0-14	Fine sandy loam	SM, ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-80	30-55	10-30	NP-10
	14-24	Sandy loam, fine sandy loam.	SM, ML, SC, SC-SM	A-2, A-4	0	0	100	100	60-90	30-55	10-30	NP-10
	24-60	Fine sand, loamy fine sand, fine sandy loam.	SM, ML	A-2, A-4	0	0	100	100	60-100	20-55	---	NP
540:												
Seelyeville-----	0-24	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	24-60	Muck, mucky peat.	PT	A-8	0	0	0	0	0	0	---	NP
541:												
Rifle----------	0-14	Mucky peat-----	PT	A-8	0	0	0	0	0	0	---	NP
	14-60	Mucky peat-----	PT	A-8	0	0	0	0	0	0	---	NP
544:												
Cathro----------	0-8	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	8-22	Sapric material	PT	A-8	0	0	0	0	0	0	---	NP
	22-60	Sandy loam, loam, clay loam.	CL-ML, SC-SM, SC, CL	A-4, A-6	0	0-5	85-100	75-100	60-100	35-90	20-40	5-20
564:												
Friendship------	0-3	Loamy sand-----	SM, SP-SM	A-1, A-2	0	0	75-100	75-100	40-75	12-30	0-14	NP
	3-31	Sand, coarse sand.	SP-SM, SM, SP	A-1, A-3, A-2	0	0	75-100	75-100	40-70	3-15	0-14	NP
	31-60	Sand, coarse sand.	SP-SM, SM, SP	A-1, A-3, A-2	0	0	75-100	75-100	40-70	3-15	0-14	NP
567A:												
Verndale--------	0-8	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	8-15	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	15-33	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	33-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1-b, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP
567B:												
Verndale--------	0-7	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	7-13	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	13-31	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	31-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1-b, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
579C2:												
Formdale	0-7	Clay loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	7-11	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	11-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
Langhei	0-7	Clay loam	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	7-13	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	13-60	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
Sandberg	0-8	Coarse sandy loam.	SM	A-2	0-3	0-5	85-100	50-95	50-65	25-35	15-20	NP-7
	8-18	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
	18-60	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
624:												
Rosy	0-20	Sandy loam	ML, SM, CL-ML, SC-SM	A-4	0	0	100	95-100	70-95	40-65	15-25	NP-6
	20-26	Loam, very fine sandy loam, fine sandy loam.	ML, SM, SC, CL	A-4, A-6	0	0	100	95-100	70-95	40-75	20-40	3-15
	26-60	Stratified sand to silty clay loam.	SM, SC, ML, CL	A-4, A-2-4	0	0	95-100	95-100	60-95	30-75	15-30	2-8
701:												
Runeberg	0-10	Mucky loam	ML, CL	A-4, A-6	0-1	2-5	95-100	90-95	80-90	50-80	30-40	5-15
	10-36	Sandy loam	SM, SC, SC-SM	A-2, A-4	0-1	5-10	85-95	80-95	60-75	30-45	15-25	3-10
	36-60	Sandy loam	SM, SC, SC-SM	A-2, A-4	0-1	5-10	85-95	80-95	60-75	30-45	15-25	3-8
711B:												
Arvilla	0-8	Sandy loam	SM, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	90-100	50-80	20-45	15-30	NP-15
	8-15	Sandy loam, loam, coarse sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	0	90-100	85-100	50-80	20-45	15-40	NP-15
	15-60	Gravelly coarse sand, coarse sand, very gravelly coarse sand.	SP-SM, GP, SM, GP-GM	A-1, A-2, A-3	0	0	35-100	25-100	10-60	0-15	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
711B:												
Sandberg--------	0-8	Coarse sandy loam.	SM	A-2	0-3	0-5	85-100	50-95	50-65	25-35	15-20	NP-7
	8-15	Gravelly loamy coarse sand, gravelly coarse sand, loamy sand.	SP-SM, SM	A-1, A-2, A-3	0-3	0-5	75-95	50-95	35-70	5-25	---	NP-4
	15-36	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
	36-60	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
711C:												
Arvilla---------	0-8	Sandy loam-----	SM, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	90-100	50-80	20-45	15-30	NP-15
	8-15	Sandy loam, loam, coarse sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	0	90-100	85-100	50-80	20-45	15-40	NP-15
	15-60	Gravelly coarse sand, coarse sand, very gravelly coarse sand.	SP-SM, GP, SM, GP-GM	A-1, A-2, A-3	0	0	35-100	25-100	10-60	0-15	---	NP
Sandberg--------	0-8	Coarse sandy loam.	SM	A-2	0-3	0-5	85-100	50-95	50-65	25-35	15-20	NP-7
	8-15	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
	15-60	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
718B:												
Naytahwaush-----	0-4	Loam-----------	CL, ML	A-6	0	0-5	95-100	90-100	75-90	60-90	30-40	10-15
	4-7	Loam, silt loam, fine sandy loam.	CL, ML	A-4, A-6	0	0-5	95-100	90-100	65-90	50-80	25-40	5-20
	7-30	Clay, silty clay, clay loam.	CL, CH	A-7	0	0-5	95-100	90-100	75-95	70-90	45-65	25-40
	30-60	Clay loam, silty clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	60-90	35-50	15-25

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
718C:												
Naytahwaush-----	0-4	Loam----------	CL, ML	A-6	0	0-5	95-100	90-100	75-90	60-90	30-40	10-15
	4-6	Loam, silt loam, fine sandy loam.	CL, ML	A-4, A-6	0	0-5	95-100	90-100	65-90	50-80	25-40	5-20
	6-23	Clay, silty clay, clay loam.	CL, CH	A-7	0	0-5	95-100	90-100	75-95	70-90	45-65	25-40
	23-60	Clay loam, silty clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	60-90	35-50	15-25
718E:												
Naytahwaush-----	0-3	Loam----------	CL, ML	A-6	0	0-5	95-100	90-100	75-90	60-90	30-40	10-15
	3-7	Loam, silt loam, fine sandy loam.	CL, ML	A-4, A-6	0	0-5	95-100	90-100	65-90	50-80	25-40	5-20
	7-23	Clay, silty clay, clay loam.	CL, CH	A-7	0	0-5	95-100	90-100	75-95	70-90	45-65	25-40
	23-60	Clay loam, silty clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	90-100	75-95	60-90	35-50	15-25
721E:												
Corliss---------	0-7	Loamy sand-----	SM, SP-SM	A-1-b, A-2-4	0	0-5	85-100	80-100	40-70	10-25	15-21	NP-4
	7-60	Coarse sand, sand, gravelly coarse sand.	SP, SP-SM	A-1-b, A-3	0	0-5	60-95	50-85	30-65	2-10	---	NP
746:												
Haslie----------	0-8	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	8-43	Sapric material, muck.	PT	A-8	0	0	0	0	0	0	---	NP
	43-60	Coprogenous earth, mucky silt loam.	OL	A-5	0	0	100	95-100	85-100	75-96	41-50	2-10
747B:												
Audubon---------	0-9	Silty clay loam	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	9-29	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	29-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
753D:												
Abbeylake-------	0-8	Loamy sand-----	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	8-24	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	24-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
753E:												
Abbeylake-------	0-3	Loamy sand-----	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	3-21	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	21-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP
765:												
Smiley----------	0-13	Loam-----------	ML, CL, CL-ML	A-4, A-6	0-1	0-2	95-100	85-100	75-95	50-80	15-35	2-12
	13-26	Clay loam, loam, silty clay loam.	CL, ML	A-6, A-7	0-1	0-2	95-100	85-100	70-95	50-80	25-50	10-25
	26-47	Loam, fine sandy loam, clay loam.	CL, SC, CL-ML, SC-SM	A-4, A-6	0-1	0-2	95-100	85-100	70-95	40-80	25-40	6-18
	47-60	Loam, fine sandy loam, clay loam.	CL, SC, CL-ML, SC-SM	A-4, A-6	0-1	0-2	95-100	85-100	70-95	40-80	25-40	6-18
767:												
Auganaush-------	0-5	Loam-----------	CL, ML, CL-ML	A-4, A-6	0	0-5	95-100	85-95	85-95	60-90	20-40	5-15
	5-8	Loam, fine sandy loam, silt loam.	SM, CL-ML, SC-SM	A-4	0	0-5	95-100	85-95	75-90	40-70	15-30	NP-10
	8-22	Clay, clay loam, silty clay loam.	CL, CH, MH	A-7	0	0-5	95-100	85-95	85-95	70-90	45-70	25-45
	22-60	Clay loam, silty clay loam, silty clay.	CL, ML, CH	A-6, A-7	0	0-5	95-100	85-95	80-95	60-90	35-55	15-30
775B:												
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-13	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	13-25	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	25-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
Two Inlets------	0-4	Loamy sand-----	SM	A-2-4	0	0-2	80-100	50-90	35-70	15-30	---	NP
	4-13	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	13-27	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	27-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
775C:												
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-10	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	10-22	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	22-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
Two Inlets------	0-2	Loamy sand-----	SM	A-2-4	0	0-2	80-100	50-90	35-70	15-30	---	NP
	2-10	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	10-27	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	27-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP
776B:												
Snellman--------	0-3	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	3-12	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	12-32	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	32-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-17	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	17-28	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	28-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
776C:												
Snellman--------	0-2	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	2-16	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	16-32	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	32-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
Sugarbush-------	0-2	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-14	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	14-21	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	21-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
776E:												
Snellman--------	0-3	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	3-14	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	14-26	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	26-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
Sugarbush-------	0-2	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-10	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	10-19	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	19-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
778B:												
Dorset----------	0-10	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	10-20	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	20-24	Gravelly loamy sand, gravelly loamy coarse sand, gravelly coarse sand.	SP-SM, SM, SC-SM, GM	A-1, A-2	0	0-5	50-90	35-75	20-50	10-25	0-20	NP-7
	24-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
Corliss---------	0-5	Loamy coarse sand.	SM, SP-SM	A-1-b, A-2-4	0	0-5	85-100	80-100	40-70	10-25	15-21	NP-4
	5-13	Loamy sand, gravelly sand, coarse sand.	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0-5	75-95	50-85	35-70	2-25	15-21	NP-4
	13-60	Coarse sand, sand, gravelly coarse sand.	SP, SP-SM	A-1-b, A-3	0	0-5	60-95	50-85	30-65	2-10	---	NP
778C:												
Dorset----------	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	9-15	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	15-18	Gravelly loamy sand, gravelly loamy coarse sand, gravelly coarse sand.	SP-SM, SM, SC-SM, GM	A-1, A-2	0	0-5	50-90	35-75	20-50	10-25	0-20	NP-7
	18-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
Corliss---------	0-5	Loamy coarse sand.	SM, SP-SM	A-1-b, A-2-4	0	0-5	85-100	80-100	40-70	10-25	15-21	NP-4
	5-60	Coarse sand, sand, gravelly coarse sand.	SP, SP-SM	A-1-b, A-3	0	0-5	60-95	50-85	30-65	2-10	---	NP
780B:												
Audubon---------	0-9	Silty clay loam	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	9-27	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	27-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
780B:												
Boyerlake-------	0-9	Clay loam------	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	70-80	51-66	29-39
	9-17	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
	17-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
780C2:												
Audubon---------	0-10	Silty clay loam	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	10-20	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	20-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
Boyerlake-------	0-9	Clay loam------	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	70-80	51-66	29-39
	9-19	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
	19-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
780D2:												
Audubon---------	0-10	Silty clay loam	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	10-22	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
	22-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	95-100	94-99	90-99	70-94	43-66	21-39
Boyerlake-------	0-7	Clay loam------	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	70-80	51-66	29-39
	7-37	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
	37-60	Silty clay loam, silty clay, clay loam.	CL, CH	A-7	0-1	0-2	96-100	93-99	85-97	80-90	51-66	29-39
785:												
Hamerly---------	0-8	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	75-95	30-45	10-25
	8-33	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	33-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
785:												
Winger----------	0-15	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	10-15
	15-22	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-90	20-40	2-15
	22-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-10	90-100	85-97	75-95	50-75	20-45	3-25
786:												
Winger----------	0-14	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	10-15
	14-33	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-90	20-40	2-15
	33-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-10	90-100	85-97	75-95	50-75	20-45	3-25
Hamerly---------	0-9	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	75-95	30-45	10-25
	9-18	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	18-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Colvin----------	0-15	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	80-95	35-50	15-30
	15-38	Silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	80-95	25-50	10-30
	38-60	Loam, silt loam, silty clay loam.	CL	A-6, A-7	0	0	100	100	90-100	70-95	25-50	10-25
797:												
Mooselake-------	0-15	Mucky peat-----	PT	A-8	0	0	0	0	0	0	---	NP
	15-60	Mucky peat-----	PT	A-8	0	0	0	0	0	0	---	NP
Lupton----------	0-15	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	15-60	Sapric material	PT	A-8	0	0	0	0	0	0	---	NP
867B:												
Graycalm--------	0-6	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	6-21	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	21-46	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
	46-60	Sand, coarse sand.	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	35-55	0-15	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
867B:												
Menahga---------	0-3	Loamy sand-----	SM, SP-SM	A-2	0	0	100	85-100	60-80	10-30	---	NP
	3-42	Coarse sand, sand, loamy coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
	42-60	Coarse sand, sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
867C:												
Graycalm--------	0-6	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	6-26	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	26-55	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
	55-60	Sand, coarse sand.	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	35-55	0-15	---	NP
Menahga---------	0-2	Loamy sand-----	SM, SP-SM	A-2	0	0	100	85-100	60-80	10-30	---	NP
	2-40	Coarse sand, sand, loamy coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
	40-60	Coarse sand, sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
867E:												
Graycalm--------	0-3	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	3-37	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	37-60	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
Menahga---------	0-12	Loamy sand-----	SM, SP-SM	A-2	0	0	100	85-100	60-80	10-30	---	NP
	12-52	Coarse sand, sand, loamy coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
	52-60	Coarse sand, sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	80-100	30-75	0-10	---	NP
903B:												
Barnes----------	0-9	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	50-90	20-40	5-20
	9-19	Loam, sandy clay loam.	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	35-80	25-40	5-20
	19-60	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-40	5-20

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
903B:												
Langhei---------	0-6	Loam-----------	CL-ML, CL	A-4, A-6	0	0-3	95-100	90-100	75-90	55-80	20-40	5-20
	6-17	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
	17-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
903C2:												
Barnes----------	0-8	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	50-90	20-40	5-20
	8-19	Loam, sandy clay loam.	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	35-80	25-40	5-20
	19-60	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-40	5-20
Langhei---------	0-7	Loam-----------	CL-ML, CL	A-4, A-6	0	0-3	95-100	90-100	75-90	55-80	20-40	5-20
	7-16	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
	16-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
931C2:												
Formdale--------	0-7	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	7-15	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	15-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
Langhei---------	0-8	Clay loam------	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	8-19	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	19-60	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
942D2:												
Langhei---------	0-7	Loam-----------	CL-ML, CL	A-4, A-6	0	0-3	95-100	90-100	75-90	55-80	20-40	5-20
	7-11	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
	11-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0-3	95-100	90-100	75-90	60-80	20-40	5-25
Barnes----------	0-7	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	80-100	50-90	20-40	5-20
	7-15	Loam, sandy clay loam.	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-5	90-100	85-100	75-95	35-80	25-40	5-20
	15-60	Loam-----------	CL, CL-ML	A-4, A-6	0	0-5	90-100	85-100	75-95	55-80	25-40	5-20

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
943D2:												
Langhei---------	0-6	Clay loam------	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	6-13	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	13-60	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
Formdale--------	0-7	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	7-14	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	14-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
943E:												
Langhei---------	0-8	Clay loam------	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
	8-60	Clay loam, silty clay loam.	CL, ML	A-7, A-6	0	0	95-100	90-100	75-95	70-80	35-45	10-20
Formdale--------	0-8	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	8-16	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	16-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
951B:												
Nebish----------	0-2	Loam----------	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	2-7	Clay loam, loam	SM, SC-SM	A-4, A-2-4	0	0-3	95-100	85-100	50-85	30-50	15-25	NP-6
	7-26	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	26-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-9	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	9-17	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	17-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
951C:												
Nebish----------	0-3	Loam----------	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	3-11	Clay loam, loam	SM, SC-SM	A-4, A-2-4	0	0-3	95-100	85-100	50-85	30-50	15-25	NP-6
	11-26	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	26-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-9	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	9-15	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	15-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
951E:												
Nebish----------	0-3	Loam----------	ML, CL-ML	A-4	0	0-3	95-100	85-100	85-95	50-70	20-40	1-10
	3-11	Clay loam, loam	SM, SC-SM	A-4, A-2-4	0	0-3	95-100	85-100	50-85	30-50	15-25	NP-6
	11-27	Loam, clay loam, sandy clay loam.	CL, ML	A-6, A-7	0	0-3	95-100	85-100	70-95	55-80	30-50	10-20
	27-60	Loam, clay loam, sandy clay loam.	CL, ML, CL-ML	A-4, A-6	0	0-3	95-100	85-100	70-95	50-80	20-40	5-20
Sugarbush-------	0-2	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-8	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	8-16	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	16-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
1015:												
Udipsamments----	0-14	Sand----------	SM, SP-SM	A-2	0	0	95-100	85-100	75-90	10-35	---	NP
	14-60	Sand, fine sand	SP-SM, SP	A-2, A-3	0	0	95-100	85-100	50-75	5-25	---	NP
	60-80	Coarse sand, gravelly coarse sand.	SP, SP-SM, GP-GM	A-1, A-2	0	0	75-100	65-85	40-65	1-10	---	NP
1016:												
Udorthents------	0-60	Variable-------	---	---	---	---	---	---	---	---	---	---
	60-80	Variable-------	---	---	0	0	0	0	0	0	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1027: Udorthents.												
1030: Pits.												
Udipsamments----	0-14	Sand----------	SM, SP-SM	A-2	0	0	95-100	85-100	75-90	10-35	---	NP
	14-60	Sand, fine sand	SP-SM, SP	A-2, A-3	0	0	95-100	85-100	50-75	5-25	---	NP
	60-80	Coarse sand, gravelly coarse sand.	SP, SP-SM, GP-GM	A-1, A-2	0	0	75-100	65-85	40-65	1-10	---	NP
1104B: Waukon----------	0-9	Loam----------	ML, CL, CL-ML	A-6, A-4	0-1	0-3	95-100	90-100	80-95	60-90	20-40	5-20
	9-17	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-3	95-100	90-100	75-95	50-85	30-45	10-20
	17-60	Loam, clay loam	ML, CL	A-6	0-1	0-3	95-100	90-100	70-95	50-80	30-40	10-20
Dorset----------	0-8	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	8-14	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	14-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
1104C: Waukon----------	0-8	Loam----------	ML, CL, CL-ML	A-6, A-4	0-1	0-3	95-100	90-100	80-95	60-90	20-40	5-20
	8-21	Clay loam, loam	CL, ML	A-6, A-7	0-1	0-3	95-100	90-100	75-95	50-85	30-45	10-20
	21-60	Loam, clay loam	ML, CL	A-6	0-1	0-3	95-100	90-100	70-95	50-80	30-40	10-20
Dorset----------	0-7	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	7-16	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	16-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
1111: Nidaros----------	0-24	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	24-38	Sandy clay loam, sandy loam, loam.	SC, CL, CL-ML, SC-SM	A-6, A-2-6, A-4	0	0	95-100	85-100	50-95	30-75	21-40	NP-20
	38-60	Coarse sand, loamy sand, gravelly sand.	SP, SM, SP-SM, SW	A-1-b, A-3, A-2-4	0	0	60-100	50-100	30-70	3-30	---	NP
1113: Haslie----------	0-20	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	20-60	Coprogenous earth, mucky silty clay.	OL	A-5	0	0	100	95-100	85-100	75-96	41-50	2-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1113:												
Seelyeville-----	0-18	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	18-60	Mucky peat, muck.	PT	A-8	0	0	0	0	0	0	---	NP
Cathro----------	0-23	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	23-60	Sandy loam, silt loam, clay loam.	SC-SM, CL-ML, SC, CL	A-4, A-6	0	0-5	80-100	65-100	60-100	35-90	20-40	4-20
1125B:												
Sverdrup--------	0-10	Sandy loam-----	SM	A-4	0	0	100	95-100	60-70	35-50	20-30	NP-10
	10-25	Loam, sandy loam, loamy sand.	ML, SM	A-2, A-4	0	0	100	95-100	50-75	30-70	15-30	NP-5
	25-60	Sand, fine sand	SP, SP-SM	A-3, A-2	0	0	100	93-100	50-90	2-10	15-20	NP-5
Abbeylake-------	0-9	Loamy sand-----	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	9-28	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	28-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP
1125C:												
Sverdrup--------	0-10	Sandy loam-----	SM	A-4	0	0	100	95-100	60-70	35-50	20-30	NP-10
	10-41	Loam, sandy loam, loamy sand.	ML, SM	A-2, A-4	0	0	100	95-100	50-75	30-70	15-30	NP-5
	41-60	Sand, fine sand	SP, SP-SM	A-3, A-2	0	0	100	93-100	50-90	2-10	15-20	NP-5
Abbeylake-------	0-9	Loamy sand-----	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	9-26	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	26-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP
1126B:												
Verndale--------	0-8	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	8-15	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	15-47	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	47-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1-b, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP
Nymore----------	0-7	Loamy sand-----	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	50-75	5-30	15-20	NP
	7-41	Sand, coarse sand, loamy coarse sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-75	2-15	15-20	NP
	41-60	Sand, coarse sand.	SP, SM, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	45-75	2-15	15-20	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1127A:												
Bootlake--------	0-7	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	7-13	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	13-18	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	18-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
Graycalm--------	0-7	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	7-22	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	22-56	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
	56-60	Sand, coarse sand.	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	35-55	0-15	---	NP
1127B:												
Bootlake--------	0-6	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	6-10	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	10-16	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	16-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
Graycalm--------	0-6	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	6-37	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	37-60	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
1128:												
Cathro----------	0-8	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	8-22	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	22-60	Stratified silty clay loam to sand.	ML, CL, CL-ML	A-4, A-6	0	0-1	95-100	90-100	75-95	50-90	15-40	2-20
1129:												
Lindaas---------	0-14	Silty clay loam	CL	A-7	0	0	100	100	95-100	85-95	41-48	21-25
	14-29	Clay, silty clay.	CL, CH	A-7	0	0	100	100	95-100	85-95	51-76	29-49
	29-60	Silt loam, silty clay loam.	CL-ML	A-6	0	0	100	100	95-100	85-95	41-48	21-25

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1130:												
Wolverton-------	0-8	Fine sandy loam	CL-ML, SC-SM, CL	A-4, A-6	0	0	100	100	90-100	40-90	15-30	4-11
	8-12	Loamy very fine sand, loamy fine sand, loamy sand.	SM, SC-SM	A-2-4, A-4	0	0	100	100	85-100	30-50	15-25	NP-7
	12-41	Loamy very fine sand, loamy fine sand, fine sand.	SM, SC-SM, SP-SM	A-2-4, A-4	0	0-3	100	90-100	75-90	10-50	15-21	NP-4
	41-60	Clay loam, silty clay loam, loam.	CL	A-4, A-6, A-7	0	1-10	95-100	90-100	50-90	50-80	28-43	9-21
1131B:												
Verndale--------	0-12	Sandy loam-----	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	12-16	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	16-35	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	35-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1-b, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP
Abbeylake-------	0-7	Loamy sand-----	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	7-22	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	22-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP
1132B:												
Eagleview-------	0-9	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	9-28	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	28-48	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	48-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1132B:												
Balmlake--------	0-7	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	7-17	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	17-24	Fine sandy loam, sandy loam, loam.	SM, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	24-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5
1132C:												
Eagleview-------	0-7	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	7-23	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	23-37	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	37-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
Balmlake--------	0-3	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	3-22	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	22-29	Fine sandy loam, sandy loam, loam.	SM, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	29-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5
1132E:												
Eagleview-------	0-3	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	3-15	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	15-46	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	46-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1132E:												
Balmlake---------	0-3	Fine sandy loam	SM, SC, SC-SM	A-2, A-4	0	0	100	95-100	60-85	30-50	15-25	2-10
	3-17	Very fine sand, loamy fine sand, fine sandy loam.	SM	A-2, A-4	0	0	100	95-100	60-85	25-50	15-25	NP-4
	17-27	Fine sandy loam, sandy loam, loam.	SM, CL, CL, SC, ML	A-4	0	0	100	95-100	60-90	35-65	20-30	2-10
	27-60	Stratified fine sand to silt loam.	SM, ML, SC-SM, CL-ML	A-2, A-4	0	0	100	95-100	65-90	30-80	15-25	NP-5
1135:												
Foxlake---------	0-19	Silty clay loam	CL, MH	A-7	0-1	0-2	95-100	95-99	85-95	70-90	43-66	21-39
	19-38	Silty clay loam, silty clay, clay loam.	CL, MH	A-7	0-1	0-2	95-100	95-99	85-95	70-90	43-66	21-39
	38-49	Silty clay loam, silty clay, clay loam.	CL, MH	A-7	0-1	0-2	95-100	95-99	85-95	70-90	43-66	21-39
	49-60	Silty clay loam, silty clay, clay loam.	CL, MH	A-7	0-1	0-2	95-100	95-99	85-95	70-90	43-66	21-39
1136:												
Nidaros---------	0-31	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	31-49	Sandy clay loam, sandy loam, loam.	SC, CL, CL-ML, SC-SM	A-6, A-2-6, A-4	0	0	95-100	85-100	50-95	30-75	21-40	NP-20
	49-60	Coarse sand, loamy sand, gravelly sand.	SP, SM, SP-SM, SW	A-1-b, A-3, A-2-4	0	0	60-100	50-100	30-70	3-30	---	NP
1137B:												
Birchlake-------	0-8	Silty clay loam	CL, MH	A-7	0-1	0-2	96-100	94-99	85-95	70-90	39-48	18-25
	8-27	Clay, silty clay, silty clay loam.	CL, CH	A-7	0-1	0-2	96-100	94-99	85-95	75-90	43-66	21-39
	27-60	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
	40-80	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
1137C:												
Birchlake-------	0-8	Silty clay loam	CL, MH	A-7	0-1	0-2	96-100	94-99	85-95	70-90	39-48	18-25
	8-17	Clay, silty clay, silty clay loam.	CL, CH	A-7	0-1	0-2	96-100	94-99	85-95	75-90	43-66	21-39
	17-60	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
	40-80	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1137D:												
Birchlake-------	0-7	Silty clay loam	CL, MH	A-7	0-1	0-2	96-100	94-99	85-95	70-90	39-48	18-25
	7-15	Clay, silty clay, silty clay loam.	CL, CH	A-7	0-1	0-2	96-100	94-99	85-95	75-90	43-66	21-39
	15-60	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
	40-80	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
1137E:												
Birchlake-------	0-7	Silty clay loam	CL, MH	A-7	0-1	0-2	96-100	94-99	85-95	70-90	39-48	18-25
	7-16	Clay, silty clay, silty clay loam.	CL, CH	A-7	0-1	0-2	96-100	94-99	85-95	75-90	43-66	21-39
	16-60	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
	40-80	Silty clay loam, clay loam.	CL, CH	A-7, A-6	0-1	0-2	96-100	94-99	85-95	70-90	35-57	18-32
1138:												
Rushlake--------	0-7	Loamy sand-----	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	75-100	15-60	10-35	---	NP
	7-60	Gravelly sand, gravelly loamy sand, sand.	SP, SP-SM	A-1-b, A-3	0	0-3	55-95	50-90	15-60	2-10	---	NP
Hangaard--------	0-13	Sandy loam-----	SM	A-2, A-4	0	0-3	95-100	80-100	50-75	20-45	---	NP
	13-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP-SM, SP	A-3, A-1, A-2	0	2-5	70-95	55-90	30-60	0-10	---	NP
1140B:												
Eagleview-------	0-9	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	9-22	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	22-40	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	40-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1140B:												
Snellman--------	0-7	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	7-18	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	18-34	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	34-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
1140C:												
Eagleview-------	0-10	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	10-30	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	30-49	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	49-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
Snellman--------	0-3	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	3-11	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	11-21	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	21-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
1149:												
Hamerly---------	0-10	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	75-95	30-45	10-25
	10-26	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	26-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1195B:												
Sybil	0-5	Loamy sand	SM, SP-SM	A-1-b, A-4, A-2-4	0	0	95-100	90-100	35-100	5-45	15-20	NP-4
	5-10	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM, SC-SM	A-1-b, A-3, A-2-4	0	0	95-100	90-100	35-90	10-55	15-25	NP-7
	10-15	Sandy loam, fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	50-90	15-70	20-30	3-9
	15-32	Sand, loamy coarse sand, loamy sand.	SP-SM, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	35-100	5-45	15-20	NP-4
	32-60	Sand, coarse sand.	SP, SP-SM	A-1-b, A-3	0	0	90-100	85-100	35-80	2-10	---	NP
Eagleview	0-7	Loamy sand	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	7-19	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	19-33	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	33-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
1195C:												
Sybil	0-8	Loamy sand	SM, SP-SM	A-1-b, A-4, A-2-4	0	0	95-100	90-100	35-100	5-45	15-20	NP-4
	8-17	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM, SC-SM	A-1-b, A-3, A-2-4	0	0	95-100	90-100	35-90	10-55	15-25	NP-7
	17-26	Sandy loam, fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	50-90	15-70	20-30	3-9
	26-37	Sand, loamy coarse sand, loamy sand.	SP-SM, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	35-100	5-45	15-20	NP-4
	37-60	Sand, coarse sand.	SP, SP-SM	A-1-b, A-3	0	0	90-100	85-100	35-80	2-10	---	NP
Eagleview	0-4	Loamy sand	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	4-15	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	15-28	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	28-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1195E:												
Sybil	0-4	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0	95-100	90-100	50-90	15-55	15-30	NP-9
	4-15	Loamy sand, loamy fine sand, sandy loam.	SM, SP-SM, SC-SM	A-1-b, A-3, A-2-4	0	0	95-100	90-100	35-90	10-55	15-25	NP-7
	15-19	Sandy loam, fine sandy loam.	SM, SC, SC-SM	A-4, A-2-4	0	0	95-100	90-100	50-90	15-70	20-30	3-9
	19-25	Sand, loamy coarse sand, loamy sand.	SP-SM, SM	A-1-b, A-3, A-2-4	0	0	90-100	85-100	35-100	5-45	15-20	NP-4
	25-60	Sand, coarse sand.	SP, SP-SM	A-1-b, A-3	0	0	90-100	85-100	35-80	2-10	---	NP
Eagleview	0-5	Loamy sand	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	5-22	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	22-39	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	39-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
1196B:												
Lida	0-9	Sandy loam	SC-SM, SM, SC, ML	A-4, A-2-4	0	0-10	85-100	85-100	30-85	15-55	0-28	NP-9
	9-13	Loamy sand, loamy coarse sand, sandy loam.	SM, SP-SM	A-4, A-3, A-2-4	0	0-10	85-100	85-100	30-85	10-55	0-25	NP-7
	13-25	Sandy loam, gravelly sandy loam, gravelly coarse sandy loam.	SM, SC, SC-SM, ML	A-4, A-2-4	0	0-5	85-100	50-85	30-75	15-55	20-28	NP-9
	25-45	Loamy sand, gravelly loamy coarse sand, gravelly loamy sand.	GM, SM, GP-GM, SP-SM	A-1-b, A-4, A-2-4	0	0-5	50-85	50-85	20-65	5-25	---	NP
	45-60	Gravelly coarse sand, sand, gravelly sand.	GP, GW, GP-GM, SP	A-1-b, A-3, A-2-4	0	0-5	50-85	50-85	20-60	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1196B:												
Two Inlets------	0-7	Sandy loam-----	SM	A-2, A-2-4	0	0-2	80-100	50-90	40-65	20-35	15-21	NP-4
	7-14	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	14-29	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	29-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP
1196C:												
Lida----------	0-8	Sandy loam-----	SC-SM, SM, SC, ML	A-4, A-2-4	0	0-10	85-100	85-100	30-85	15-55	0-28	NP-9
	8-17	Loamy sand, loamy coarse sand, sandy loam.	SM, SP-SM	A-4, A-3, A-2-4	0	0-10	85-100	85-100	30-85	10-55	0-25	NP-7
	17-25	Sandy loam, gravelly sandy loam, gravelly coarse sandy loam.	SM, SC, SC-SM, ML	A-4, A-2-4	0	0-5	85-100	50-85	30-75	15-55	20-28	NP-9
	25-41	Loamy sand, gravelly loamy coarse sand, gravelly loamy sand.	GM, SM, GP-GM, SP-SM	A-1-b, A-4, A-2-4	0	0-5	50-85	50-85	20-65	5-25	---	NP
	41-60	Gravelly coarse sand, sand, gravelly sand.	GP, GW, GP-GM, SP	A-1-b, A-3, A-2-4	0	0-5	50-85	50-85	20-60	2-10	---	NP
Two Inlets------	0-4	Sandy loam-----	SM	A-2, A-2-4	0	0-2	80-100	50-90	40-65	20-35	15-21	NP-4
	4-9	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	9-38	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	38-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1196E:												
Lida----------	0-3	Sandy loam-----	SC-SM, SM, SC, ML	A-4, A-2-4	0	0-10	85-100	85-100	30-85	15-55	0-28	NP-9
	3-14	Loamy sand, loamy coarse sand, sandy loam.	SM, SP-SM	A-4, A-3, A-2-4	0	0-10	85-100	85-100	30-85	10-55	0-25	NP-7
	14-20	Sandy loam, gravelly sandy loam, gravelly coarse sandy loam.	SM, SC, SC-SM, ML	A-4, A-2-4	0	0-5	85-100	50-85	30-75	15-55	20-28	NP-9
	20-27	Loamy sand, gravelly loamy coarse sand, gravelly loamy sand.	GM, SM, GP-GM, SP-SM	A-1-b, A-4, A-2-4	0	0-5	50-85	50-85	20-65	5-25	---	NP
	27-60	Gravelly coarse sand, sand, gravelly sand.	GP, GW, GP-GM, SP	A-1-b, A-3, A-2-4	0	0-5	50-85	50-85	20-60	2-10	---	NP
Two Inlets------	0-3	Sandy loam-----	SM	A-2, A-2-4	0	0-2	80-100	50-90	40-65	20-35	15-21	NP-4
	3-7	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	7-21	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	21-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP
1200:												
Egglake---------	0-4	Loam-----------	ML, CL-ML	A-4	0-1	0-5	95-100	85-98	50-97	50-90	15-25	3-7
	4-9	Fine sandy loam, sandy loam, loam.	SM	A-2-4	0-1	0-5	95-100	85-98	40-50	25-35	15-21	2-4
	9-20	Sandy clay loam, sandy loam, loam.	SC, CL	A-6, A-4	0-1	0-5	95-100	85-98	55-75	40-60	28-36	9-15
	20-60	Sandy loam, coarse sandy loam, fine sandy loam.	SC-SM, SC, CL-ML, CL	A-4	0-1	0-5	95-100	85-98	50-70	35-55	21-28	4-9

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1201C:												
Sugarbush-------	0-2	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-14	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	14-24	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	24-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
Snellman--------	0-2	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	2-14	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	14-29	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	29-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
1201E:												
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-11	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	11-15	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	15-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
Snellman--------	0-2	Sandy loam-----	SM, SC-SM	A-4	0	0-10	90-100	80-95	65-80	40-50	25-30	2-5
	2-15	Loamy sand, sandy loam, fine sandy loam.	SM, SC-SM	A-4, A-2	0	0-10	88-100	80-95	65-80	30-50	15-20	NP-5
	15-28	Sandy clay loam, sandy loam, clay loam.	SC, CL	A-6	0	0-10	90-100	80-95	70-80	35-50	25-40	10-20
	28-60	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10
	41-80	Sandy loam, fine sandy loam.	SC-SM, SC	A-4	0	0-10	85-95	80-95	65-80	35-50	15-25	5-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1210:												
Paddock	0-9	Sandy loam	SM, SC-SM	A-2, A-4	0	2-10	85-100	80-100	60-80	25-40	0-25	1-7
	9-16	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0-10	85-95	85-90	60-75	25-40	0-20	1-5
	16-29	Sandy loam	SM, SC, SC-SM	A-2, A-4	0	0-10	85-95	80-95	60-75	25-45	0-25	2-10
	29-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	0-10	85-90	80-90	60-75	25-40	0-20	2-8
Epoufette	0-8	Sandy loam	SM, SC-SM	A-2, A-4	0	0-5	95-100	65-95	60-75	25-40	15-25	NP-7
	8-17	Loamy sand, sand, gravelly loamy sand.	SM, SP, SP-SM	A-2, A-3	0	0-5	95-100	65-95	50-75	0-30	---	NP
	17-25	Gravelly sandy loam, sandy loam, gravelly loamy sand.	SM, SC, SC-SM	A-2, A-4	0	0-5	95-100	70-95	60-80	25-40	15-25	2-10
	25-60	Gravelly sand, coarse sand, sand.	SP, GP, SP-SM, GP-GM	A-1, A-3, A-2-4	0	0-10	50-90	45-85	30-60	0-10	---	NP
1211:												
Egglake	0-4	Sandy loam	SM, SC-SM	A-4, A-2-4	0-1	0-5	95-100	85-98	45-55	30-40	15-25	3-7
	4-9	Fine sandy loam, sandy loam, loam.	SM	A-2-4	0-1	0-5	95-100	85-98	40-50	25-35	15-21	2-4
	9-25	Sandy clay loam, sandy loam, loam.	SC, CL	A-6, A-4	0-1	0-5	95-100	85-98	55-75	40-60	28-36	9-15
	25-60	Sandy loam, coarse sandy loam, fine sandy loam.	SC-SM, SC, CL-ML, CL	A-4	0-1	0-5	95-100	85-98	50-70	35-55	21-28	4-9
Cathro	0-17	Muck	PT	A-8	0	0	0	0	0	0	---	NP
	17-60	Sandy loam, loam, clay loam.	CL-ML, SC-SM, SC, CL	A-4, A-6	0	0-5	85-100	75-100	60-100	35-90	20-40	5-20
1225:												
Wykeham	0-8	Sandy loam	SM, SC-SM	A-4	0	0-5	90-100	85-100	65-80	40-50	25-30	2-5
	8-16	Fine sandy loam, loamy sand, sandy loam.	SM, SC-SM	A-4, A-2	0	0-5	85-100	70-95	65-80	25-50	15-20	1-5
	16-37	Loam, sandy clay loam, sandy loam.	SC, CL	A-6	0	0-5	90-100	85-95	70-80	35-60	30-35	10-15
	37-60	Fine sandy loam, sandy loam.	SC-SM, SC	A-4	0	0-5	85-95	85-95	65-80	35-50	20-25	5-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1225:												
Karlstad--------	0-12	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0-5	0-5	95-100	95-100	75-95	12-50	15-25	NP-10
	12-18	Coarse sandy loam, sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4	0-5	0-5	95-100	95-100	75-95	12-50	15-25	NP-10
	18-29	Gravelly coarse sandy loam, gravelly sandy loam, gravelly fine sandy loam.	SC, SM, SC-SM, SP-SM	A-2, A-1, A-3	0-5	0-25	65-95	50-75	25-50	10-30	15-25	NP-10
	29-60	Stratified gravelly coarse sand to loamy fine sand.	SP, SP-SM	A-1, A-2, A-3	0-5	0-25	60-100	35-100	20-80	10-55	---	NP
1227:												
Quam----------	0-33	Silt loam------	OL, ML	A-7, A-4, A-6, A-5	0	0	100	100	80-100	70-95	30-50	5-20
	33-50	Silty clay loam, silt loam, loam.	CL, ML	A-7, A-6, A-4	0	0	100	100	80-100	70-95	30-50	5-25
	50-60	Clay loam, silty clay loam, silt loam.	CL, ML, CL-ML	A-4, A-6, A-7	0	0	100	90-100	85-95	70-90	20-50	5-20
Cathro----------	0-24	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	24-60	Sandy loam, silt loam, clay loam.	SC-SM, CL-ML, SC, CL	A-4, A-6	0	0-5	80-100	65-100	60-100	35-90	20-40	4-20
Urness----------	0-20	Mucky silt loam	OL, CL, CL-ML	A-4, A-6, A-7	0	0	100	100	90-100	70-95	20-50	3-20
	20-45	Mucky silt loam, mucky silty clay loam, silty clay loam.	ML, CL, CL-ML, OL	A-4, A-6, A-7	0	0	95-100	90-100	85-100	70-95	20-50	3-30
	45-60	Silty clay loam, silt loam, loam.	CL, ML	A-6, A-7	0	0-2	95-100	85-100	75-100	65-95	35-50	11-20
1230:												
Haslie----------	0-18	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	18-60	Coprogenous earth, mucky silty clay.	OL	A-5	0	0	100	95-100	85-100	75-96	41-50	2-10
Nidaros---------	0-38	Muck-----------	PT	A-8	0	0	0	0	0	0	---	NP
	38-54	Coarse sandy loam, sandy clay loam, loam.	SC-SM, SC, CL, CL-ML	A-6, A-4, A-2-6	0	0	95-100	85-100	45-95	25-70	21-40	NP-20
	54-60	Coarse sand, sand, gravelly coarse sand.	SP, SM, SP-SM, SW	A-1-b, A-3, A-2-4	0	0	60-100	50-100	30-70	3-15	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1234B:												
Formdale--------	0-8	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	8-15	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	15-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
Buse------------	0-7	Clay loam------	CL, ML	A-6, A-7	0	0-5	90-100	85-95	70-95	55-90	35-45	10-20
	7-60	Loam, clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0-5	90-100	85-100	70-90	55-85	25-45	5-20
1235B:												
Formdale--------	0-8	Clay loam------	CL	A-7, A-6	0	0-3	95-100	90-100	85-100	75-90	35-50	15-30
	8-11	Clay loam, loam	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
	11-60	Clay loam, silty clay loam, loam.	CL	A-7, A-6	0	0-3	95-100	90-100	85-95	70-80	35-50	15-30
Buse------------	0-8	Loam-----------	ML, CL, CL-ML	A-4, A-6	0	0-5	90-100	85-95	70-95	55-90	20-35	3-15
	8-60	Loam, clay loam	CL, ML, CL-ML	A-4, A-6, A-7	0	0-5	90-100	85-100	70-90	55-85	25-45	5-20
Sandberg--------	0-8	Coarse sandy loam.	SM	A-2	0-3	0-5	85-100	50-95	50-65	25-35	15-20	NP-7
	8-12	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
	12-60	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
1236B:												
Eagleview-------	0-2	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	2-11	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	11-48	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	48-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1236C:												
Eagleview-------	0-7	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	7-23	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	23-37	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	37-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
1236E:												
Eagleview-------	0-3	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	3-16	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	16-40	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	40-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
1238E:												
Two Inlets------	0-2	Loamy sand-----	SM	A-2-4	0	0-2	80-100	50-90	35-70	15-30	---	NP
	2-10	Loamy coarse sand, gravelly loamy coarse sand, coarse sandy loam.	SM	A-2-4	0	0-2	80-100	50-90	30-65	15-30	15-21	NP-4
	10-33	Loamy coarse sand, gravelly loamy coarse sand, loamy sand.	SM	A-2-4, A-2, A-3	0	0-5	80-100	50-90	30-65	5-30	15-25	NP-7
	33-60	Gravelly coarse sand, gravelly sand.	SP, SP-SM	A-1, A-3	0	0-5	60-95	50-75	30-55	2-10	---	NP
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-12	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	12-18	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	18-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1242D:												
Sandberg--------	0-7	Coarse sandy loam.	SM	A-2	0-3	0-5	85-100	50-95	50-65	25-35	15-20	NP-7
	7-19	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
	19-60	Gravelly coarse sand, coarse sand, sand.	SP, SP-SM	A-1, A-3, A-2	0-3	0-5	60-95	50-95	30-65	2-10	---	NP
Arvilla---------	0-7	Sandy loam-----	SM, SC, SC-SM	A-2, A-4, A-6	0	0	95-100	90-100	50-80	20-45	15-30	NP-15
	7-17	Sandy loam, loam, coarse sandy loam.	SM, SC, SC-SM	A-2, A-4, A-6	0	0	90-100	85-100	50-80	20-45	15-40	NP-15
	17-60	Gravelly coarse sand, coarse sand, very gravelly coarse sand.	SP-SM, GP, SM, GP-GM	A-1, A-2, A-3	0	0	35-100	25-100	10-60	0-15	---	NP
1243B:												
Sol----------	0-3	Sandy loam-----	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	3-17	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	17-30	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	30-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10
1243C:												
Sol----------	0-2	Sandy loam-----	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	2-18	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	18-30	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	30-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10
1243E:												
Sol----------	0-3	Sandy loam-----	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	3-18	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	18-36	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	36-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1244B:												
Sol	0-2	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	2-21	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	21-30	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	30-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10
Sugarbush	0-2	Sandy loam	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-13	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	13-21	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	21-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
1244C:												
Sol	0-2	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	2-22	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	22-31	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	31-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10
Sugarbush	0-2	Sandy loam	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	2-18	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	18-38	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	38-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
1244E:												
Sol	0-3	Sandy loam	SM, SC, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	50-80	25-40	15-25	2-8
	3-23	Loamy sand, loamy fine sand, fine sandy loam.	SM, SC-SM	A-2-4, A-4	0	0-15	95-100	75-95	45-80	20-40	15-20	NP-7
	23-30	Loam, sandy clay loam.	SC, CL	A-4, A-6	0	0-1	95-100	75-95	70-90	40-70	25-40	8-18
	30-60	Fine sandy loam, sandy loam.	SM, SC, CL, ML	A-2-4, A-4	0	0-1	95-100	75-95	60-85	35-55	15-25	2-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1244E:												
Sugarbush-------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	80-100	55-70	25-35	15-20	NP-4
	3-17	Loamy sand, loamy coarse sand, sand.	SM, SP-SM	A-1-b, A-2-4	0	0	95-100	80-100	40-70	10-25	---	NP
	17-47	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	80-100	50-70	25-35	15-20	NP-4
	47-60	Gravelly coarse sand, gravelly sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0-5	0-5	55-85	50-85	30-55	2-10	---	NP
1246:												
Winger----------	0-15	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	10-15
	15-37	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	80-90	20-40	2-15
	37-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-10	90-100	85-97	75-95	50-75	20-45	3-25
1247D:												
Corliss---------	0-9	Loamy coarse sand.	SM, SP-SM	A-1-b, A-2-4	0	0-5	85-100	80-100	40-70	10-25	15-21	NP-4
	9-16	Loamy sand, gravelly sand, coarse sand.	SP-SM, SM, SP	A-1-b, A-3, A-2-4	0	0-5	75-95	50-85	35-70	2-25	15-21	NP-4
	16-60	Coarse sand, sand, gravelly coarse sand.	SP, SP-SM	A-1-b, A-3	0	0-5	60-95	50-85	30-65	2-10	---	NP
Dorset----------	0-9	Sandy loam-----	SM, SC-SM	A-4, A-2	0	0	90-100	85-100	50-70	25-50	0-25	NP-5
	9-17	Loam, sandy loam, coarse sandy loam.	SC-SM, SC, CL-ML, CL	A-4, A-6	0	0	90-100	85-100	50-90	35-75	15-30	4-14
	17-25	Gravelly loamy sand, gravelly loamy coarse sand, gravelly coarse sand.	SP-SM, SM, SC-SM, GM	A-1, A-2	0	0-5	50-90	35-75	20-50	10-25	0-20	NP-7
	25-60	Gravelly coarse sand, gravelly sand.	SP, GP, SP-SM, GP-GM	A-1	0	0-5	50-90	35-75	15-40	0-10	0-20	NP
1248C:												
Nymore----------	0-7	Loamy sand-----	SM, SP-SM	A-2, A-3	0	0	95-100	90-100	50-75	5-30	15-20	NP
	7-55	Sand, coarse sand, loamy coarse sand.	SM, SP, SP-SM	A-1, A-2, A-3	0	0	95-100	85-100	45-75	2-15	15-20	NP
	55-60	Sand, coarse sand.	SP, SM, SP-SM	A-1, A-3, A-2	0	0	95-100	85-100	45-75	2-15	15-20	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1248C:												
Verndale--------	0-6	Coarse sandy loam.	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	6-27	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	27-48	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	48-60	Sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP
1249C:												
Graycalm--------	0-8	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0-5	95-100	75-100	35-75	10-30	---	NP
	8-18	Sand, loamy sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0-5	95-100	75-100	30-75	0-30	---	NP
	18-37	Sand, loamy sand, loamy coarse sand.	SM, SP, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	30-75	0-30	---	NP
	37-60	Sand, coarse sand.	SP, SM, SP-SM	A-2, A-1, A-3	0	0-5	95-100	75-100	35-55	0-15	---	NP
Bootlake--------	0-8	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	8-17	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	17-27	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	27-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
1250C:												
Abbeylake-------	0-9	Loamy coarse sand.	SM, SP-SM	A-2-4	0	0	100	85-100	55-70	10-25	---	NP-4
	9-16	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2-4	0	0	100	85-100	55-75	2-15	---	NP-4
	16-60	Sand, coarse sand.	SP, SP-SM	A-3, A-1	0	0	100	85-100	40-75	2-10	---	NP
Verndale--------	0-8	Coarse sandy loam.	SM, SC-SM	A-4, A-2-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	8-14	Sandy loam, fine sandy loam, loam.	SC, SC-SM	A-4, A-2-4	0	0	98-100	85-100	60-85	25-45	20-26	5-10
	14-28	Sand, coarse sand, loamy coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP-2
	28-60	Sand, coarse sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0	0	96-100	75-100	45-60	3-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1251:												
Lamoure---------	0-41	Silt loam------	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-50	10-25
	41-53	Silty clay loam, silt loam.	CL, CH, MH, ML	A-7	0	0	100	100	90-100	60-100	40-70	15-35
	53-60	Stratified sandy loam to silty clay loam.	CL, SC	A-6, A-7	0	0	95-100	95-100	70-95	35-90	30-70	10-35
1252B:												
Bootlake--------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	3-14	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	14-41	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	41-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP
Eagleview-------	0-2	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	2-12	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	12-42	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	42-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
1263C:												
Eagleview-------	0-3	Loamy sand-----	SP-SM, SM	A-2, A-1	0	0	100	85-100	60-80	10-25	---	NP
	3-17	Loamy sand, loamy coarse sand, sand.	SP-SM, SM, SP	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	17-32	Sand, coarse sand, loamy sand.	SP, SM, SP-SM	A-3, A-2, A-1	0	0	100	85-100	50-75	2-15	---	NP
	32-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2, A-1	0	0	100	85-100	40-75	2-10	---	NP
Bootlake--------	0-3	Sandy loam-----	SM	A-2-4	0	0	95-100	90-100	55-70	25-35	0-20	NP-4
	3-15	Coarse sand, loamy coarse sand, loamy sand.	SM, SP-SM	A-2-4, A-1-b	0	0	95-100	90-100	40-70	10-25	0-14	NP
	15-24	Sandy loam, coarse sandy loam.	SM	A-2-4	0	0	95-100	90-100	50-65	25-35	0-20	NP-4
	24-60	Sand, coarse sand.	SP, SP-SM	A-3, A-2-4	0	0	95-100	75-100	50-80	2-10	0-14	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1291:												
Sedgeville------	0-8	Loam----------	CL, SC, CL-ML, SC-SM	A-4, A-6	0	0-5	80-100	75-100	65-100	45-85	20-35	4-15
	8-34	Silt loam, sandy loam, coarse sandy loam.	SM, SC, CL, SC-SM	A-2-4, A-4, A-1	0	0-5	80-100	75-100	35-100	20-90	15-30	3-10
	34-60	Sand, coarse sand, gravelly loamy coarse sand.	SP, SM, GP, SP-SM	A-1	0	0-5	80-100	50-100	15-25	1-20	---	NP
1306:												
Karlstad--------	0-15	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0-5	0-5	95-100	95-100	75-95	12-50	15-25	NP-10
	15-27	Coarse sandy loam, sandy loam, fine sandy loam.	SM, SC, SC-SM	A-2, A-4	0-5	0-5	95-100	95-100	75-95	12-50	15-25	NP-10
	27-60	Stratified gravelly coarse sand to loamy fine sand.	SP, SP-SM	A-1, A-2, A-3	0-5	0-25	60-100	35-100	20-80	10-55	---	NP
1317:												
Vallers---------	0-15	Silty clay loam	OL, CL, ML	A-6, A-7	0	0	95-100	95-100	95-100	85-95	30-50	11-20
	15-23	Clay loam, silty clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-95	50-80	30-40	11-20
	23-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-95	60-85	20-40	5-20
1318:												
Darnen----------	0-56	Loam----------	ML, CL, CL-ML	A-4	0	0	100	100	85-100	60-90	20-35	2-10
	56-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	60-90	20-45	5-25
1319B:												
Rockwood--------	0-4	Sandy loam-----	SM	A-2, A-4	0	5-10	85-100	85-100	60-80	30-40	15-25	NP-4
	4-14	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-90	60-75	30-40	15-20	1-8
	14-19	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	19-30	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	30-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	80-90	60-75	25-40	15-25	2-10

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1319C:												
Rockwood--------	0-7	Sandy loam-----	SM	A-2, A-4	0	5-10	85-100	85-100	60-80	30-40	15-25	NP-4
	7-16	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-90	60-75	30-40	15-20	1-8
	16-23	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	23-31	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	31-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	80-90	60-75	25-40	15-25	2-10
1319D:												
Rockwood--------	0-2	Sandy loam-----	SM	A-2, A-4	0	5-10	85-100	85-100	60-80	30-40	15-25	NP-4
	2-15	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-90	60-75	30-40	15-20	1-8
	15-21	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	21-32	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	85-95	60-75	30-40	15-25	2-10
	32-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	5-10	85-95	80-90	60-75	25-40	15-25	2-10
1320B:												
Blowers---------	0-3	Sandy loam-----	SM, SC-SM	A-2, A-4	0	0-10	85-100	85-100	60-80	30-40	20-30	1-7
	3-14	Sandy loam-----	SM, SC-SM	A-2, A-4	0	0-10	85-95	85-90	60-75	30-40	0-20	1-5
	14-22	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	0-10	85-95	85-95	60-75	30-40	0-25	2-10
	22-32	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	0-10	85-95	80-95	60-75	30-40	0-25	2-10
	32-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	0-10	85-95	80-90	60-75	25-40	0-25	2-10
1321:												
Paddock---------	0-4	Fine sandy loam	SM, SC-SM	A-2, A-4	0	2-10	85-100	80-100	60-80	25-40	0-25	1-7
	4-16	Sandy loam, fine sandy loam.	SM, SC-SM	A-2, A-4	0	0-10	85-95	85-90	60-75	25-40	0-20	1-5
	16-43	Sandy loam-----	SM, SC, SC-SM	A-2, A-4	0	0-10	85-95	80-95	60-75	25-45	0-25	2-10
	43-60	Sandy loam, loamy sand.	SM, SC, SC-SM	A-2, A-4	0	0-10	85-90	80-90	60-75	25-40	0-20	2-8
1365:												
Hillview--------	0-8	Fine sandy loam	SM, SC, SC-SM	A-2, A-4, A-2-4	0	0	98-100	93-100	60-85	30-50	15-25	2-10
	8-19	Sandy loam, loamy fine sand, loamy sand.	SM, SC-SM, ML, CL-ML	A-2, A-4, A-2-4	0	0	98-100	93-100	45-85	20-60	10-20	NP-7
	19-28	Sandy loam, fine sandy loam, loam.	SM, SC, CL, ML	A-2, A-4, A-2-4	0	0	98-100	93-100	60-90	35-65	15-30	2-12
	28-60	Stratified very fine sandy loam to fine sand.	SM, ML, SC-SM, CL-ML	A-2, A-4, A-2-4	0	0	98-100	93-100	60-90	20-70	10-20	NP-7

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1825B:												
Seelyeville-----	0-60	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
1878:												
Hamre----------	0-14	Muck----------	PT	A-8	0	0	0	0	0	0	---	NP
	14-19	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	90-100	80-100	70-100	50-90	25-45	6-20
	19-60	Loam, clay loam, silt loam.	CL, CL-ML	A-4, A-6, A-7	0-1	0-3	80-100	75-100	65-95	50-85	25-45	6-20
1938:												
Lakepark--------	0-8	Clay loam------	CL	A-6	0	0	100	92-100	90-100	65-90	30-40	10-15
	8-28	Clay loam, silty clay loam, silt loam.	ML, CL	A-4, A-6	0	0	100	92-100	90-100	65-90	30-40	2-12
	28-34	Silty clay loam, clay loam, loam.	CL	A-6, A-7	0	0-5	95-100	90-98	85-100	65-90	30-45	15-30
	34-60	Clay loam, loam	CL	A-6	0	0-5	95-100	90-98	75-85	55-75	30-40	10-20
1942:												
Forada----------	0-10	Mucky loam-----	ML	A-4	0	0	95-100	85-100	70-90	50-70	25-35	NP-10
	10-21	Sandy loam, loam, fine sandy loam.	ML, SM	A-4, A-2	0	0	95-100	85-100	55-85	30-60	20-40	NP-10
	21-60	Sand, coarse sand, gravelly coarse sand.	SP, SM, SP-SM, GP-GM	A-1, A-2, A-3	0	0	50-90	50-80	40-70	2-30	0-14	NP
1967:												
Hamerly---------	0-9	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	75-95	30-45	10-25
	9-20	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	20-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Vallers---------	0-15	Silty clay loam	OL, CL, ML	A-6, A-7	0	0	95-100	95-100	95-100	85-95	30-50	11-20
	15-25	Clay loam, silty clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-95	50-80	30-40	11-20
	25-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-95	60-85	20-40	5-20
1975:												
Oylen-----------	0-13	Sandy loam-----	SM, SC-SM	A-2-4, A-4	0	0	100	85-100	60-85	25-45	15-20	3-6
	13-22	Loam, sandy loam.	SC, CL, SC-SM, CL-ML	A-4	0	0	100	85-100	60-85	35-60	20-30	5-10
	22-52	Loamy sand, sand, coarse sand.	SM, SP-SM	A-3, A-2-4	0	0	98-100	85-100	50-65	5-20	---	NP
	52-60	Sand, coarse sand, gravelly sand.	SP, SP-SM	A-1-b, A-3, A-2-4	0	0	90-100	60-100	35-55	3-10	---	NP

ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				Pct	Pct					Pct	
1997:												
Vallers---------	0-15	Silty clay loam	OL, CL, ML	A-6, A-7	0	0	95-100	95-100	95-100	85-95	30-50	11-20
	15-27	Clay loam, silty clay loam, sandy clay loam.	CL	A-6	0	0	95-100	90-100	80-95	50-80	30-40	11-20
	27-60	Loam, clay loam	CL, CL-ML	A-4, A-6	0	0	95-100	90-100	85-95	60-85	20-40	5-20
Hamerly---------	0-9	Clay loam------	CL	A-6, A-7	0	0-5	95-100	90-100	80-95	75-95	30-45	10-25
	9-21	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	80-95	60-75	20-45	5-25
	21-60	Loam, clay loam	CL, CL-ML	A-4, A-6, A-7	0	0-5	95-100	90-100	75-95	55-75	20-45	5-25
Winger----------	0-22	Silty clay loam	CL	A-6	0	0	100	100	90-100	70-90	30-40	10-15
	22-35	Silt loam, silty clay loam.	ML, CL, CL-ML	A-4, A-6	0	0	100	100	90-100	70-90	20-40	2-15
	35-60	Loam, clay loam	ML, CL, CL-ML	A-4, A-6, A-7	0	0-10	90-100	85-100	75-95	50-75	20-45	3-25

PHYSICAL PROPERTIES OF THE SOILS

(Entries under "Erosion factors—T" apply to the entire profile. Entries under "Wind erodibility group" apply only to the surface layer)

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
20B:											
Chapett	0-8	10-20	1.35-1.65	0.60-2.00	0.13-0.19	Low	2.0-4.0	0.20	0.20	5	3
	8-23	18-28	1.30-1.65	0.60-2.00	0.15-0.19	Low	0.5-1.0	0.32	0.32		
	23-33	10-18	1.40-1.65	0.60-2.00	0.11-0.19	Low	0.0-0.5	0.28	0.28		
	33-60	10-18	1.65-1.80	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.28	0.28		
20C2:											
Chapett	0-9	10-20	1.35-1.65	0.60-2.00	0.13-0.19	Low	2.0-4.0	0.20	0.20	5	3
	9-26	18-28	1.30-1.65	0.60-2.00	0.15-0.19	Low	0.5-1.0	0.32	0.32		
	26-43	10-18	1.40-1.65	0.60-2.00	0.11-0.19	Low	0.0-0.5	0.28	0.28		
	43-60	10-18	1.65-1.80	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.28	0.28		
20E:											
Chapett	0-7	10-20	1.35-1.65	0.60-2.00	0.13-0.19	Low	2.0-4.0	0.20	0.20	5	3
	7-20	18-28	1.30-1.65	0.60-2.00	0.15-0.19	Low	0.5-1.0	0.32	0.32		
	20-33	10-18	1.40-1.65	0.60-2.00	0.11-0.19	Low	0.0-0.5	0.28	0.28		
	33-60	10-18	1.65-1.80	0.60-2.00	0.10-0.16	Low	0.0-0.5	0.28	0.28		
26:											
Aazdahl	0-13	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	4.0-6.0	0.24	0.24	5	6
	13-19	27-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	1.0-3.0	0.37	0.37		
	19-60	24-35	1.50-1.65	0.20-0.60	0.14-0.17	Moderate	0.0-0.5	0.37	0.37		
33B:											
Barnes	0-7	18-27	1.40-1.50	0.60-2.00	0.18-0.24	Low	2.0-5.0	0.28	0.32	5	6
	7-13	18-27	1.50-1.60	0.60-2.00	0.15-0.19	Low	0.5-1.0	0.28	0.32		
	13-60	18-27	1.50-1.60	0.60-2.00	0.14-0.19	Low	0.0-0.5	0.37	0.43		
36:											
Flom	0-16	27-35	1.25-1.45	0.20-0.60	0.18-0.22	Moderate	5.0-8.0	0.28	0.28	5	7
	16-24	24-35	1.45-1.60	0.20-0.60	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	24-60	24-35	1.55-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
38B:											
Waukon	0-9	12-27	1.40-1.60	0.60-2.00	0.20-0.24	Moderate	2.0-6.0	0.24	0.24	5	6
	9-20	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.32		
	20-60	18-30	1.45-1.65	0.60-2.00	0.15-0.19	Low	0.0-0.5	0.32	0.32		
38C:											
Waukon	0-8	12-27	1.40-1.60	0.60-2.00	0.20-0.24	Moderate	2.0-6.0	0.24	0.24	5	6
	8-20	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.32		
	20-60	18-30	1.45-1.65	0.60-2.00	0.15-0.19	Low	0.0-0.5	0.32	0.32		
38E:											
Waukon	0-7	12-27	1.40-1.60	0.60-2.00	0.20-0.24	Moderate	2.0-6.0	0.24	0.24	5	6
	7-26	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.32		
	26-60	18-30	1.45-1.65	0.60-2.00	0.15-0.19	Low	0.0-0.5	0.32	0.32		
40B:											
Nebish	0-7	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low	1.0-2.0	0.32	0.32	5	5
	7-26	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	26-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low	0.0-0.5	0.32	0.32		
40C:											
Nebish	0-8	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low	1.0-2.0	0.32	0.32	5	5
	8-26	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	26-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low	0.0-0.5	0.32	0.32		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
40E:											
Nebish----------	0-9	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low------	1.0-2.0	0.32	0.32	5	5
	9-22	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	22-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low------	0.0-0.5	0.32	0.32		
47:											
Colvin----------	0-10	27-34	1.20-1.50	0.20-0.60	0.20-0.22	Moderate	4.0-7.0	0.32	0.32	5	4L
	10-26	18-34	1.20-1.50	0.20-0.60	0.16-0.20	Moderate	0.0-5.0	0.32	0.32		
	26-60	18-34	1.30-1.50	0.20-0.60	0.15-0.20	Moderate	0.0-1.0	0.32	0.32		
63:											
Rockwell--------	0-18	20-30	1.20-1.45	0.60-2.00	0.18-0.22	Low------	4.0-8.0	0.24	0.24	5	4L
	18-25	5-30	1.35-1.50	2.00-6.00	0.15-0.17	Low------	0.5-1.0	0.24	0.24		
	25-32	3-10	1.40-1.60	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.24	0.24		
	32-60	15-30	1.40-1.60	0.20-2.00	0.18-0.22	Low------	0.0-0.5	0.24	0.24		
108:											
McIntosh--------	0-9	18-27	1.35-1.50	0.60-2.00	0.20-0.24	Low------	4.0-7.0	0.28	0.28	5	4L
	9-30	18-35	1.40-1.50	0.60-2.00	0.16-0.22	Moderate	0.5-1.0	0.43	0.43		
	30-60	18-35	1.30-1.60	0.20-2.00	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
111:											
Hangaard--------	0-10	8-18	1.25-1.45	2.00-6.00	0.10-0.14	Low------	3.0-8.0	0.20	0.20	5	3
	10-18	5-15	1.50-1.70	6.00-20.00	0.07-0.11	Low------	1.0-3.0	0.20	0.20		
	18-60	2-10	1.50-1.70	6.00-40.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
121:											
Wykeham---------	0-8	5-18	1.30-1.55	0.60-6.00	0.13-0.18	Low------	2.0-6.0	0.17	0.20	5	3
	8-11	5-15	1.50-1.70	0.60-2.00	0.10-0.17	Low------	1.0-2.0	0.24	0.28		
	11-21	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.5-1.0	0.24	0.28		
	21-60	10-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.24	0.28		
125:											
Beltrami--------	0-4	6-18	1.30-1.40	0.60-2.00	0.20-0.22	Low------	3.0-6.0	0.32	0.32	5	5
	4-8	5-15	1.40-1.65	0.60-6.00	0.11-0.19	Low------	1.0-3.0	0.32	0.32		
	8-22	18-35	1.50-1.65	0.20-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	22-60	18-30	1.50-1.70	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
133A:											
Dalbo-----------	0-6	20-27	1.25-1.45	0.60-2.00	0.22-0.24	Low------	2.0-4.0	0.43	---	5	6
	6-41	35-60	1.25-1.45	0.06-0.60	0.10-0.18	High-----	0.5-2.0	0.32	---		
	41-60	24-35	1.30-1.60	0.20-2.00	0.20-0.22	Moderate	0.0-0.5	0.32	---		
133B:											
Dalbo-----------	0-7	20-27	1.25-1.45	0.60-2.00	0.22-0.24	Low------	2.0-4.0	0.43	---	5	6
	7-21	35-60	1.25-1.45	0.06-0.60	0.10-0.18	High-----	0.5-2.0	0.32	---		
	21-60	24-35	1.30-1.60	0.20-2.00	0.20-0.22	Moderate	0.0-0.5	0.32	---		
133C:											
Dalbo-----------	0-7	20-27	1.25-1.45	0.60-2.00	0.22-0.24	Low------	2.0-4.0	0.43	---	5	6
	7-25	35-60	1.25-1.45	0.06-0.60	0.10-0.18	High-----	0.5-2.0	0.32	---		
	25-60	24-35	1.30-1.60	0.20-2.00	0.20-0.22	Moderate	0.0-0.5	0.32	---		
133E:											
Dalbo-----------	0-7	20-27	1.25-1.45	0.60-2.00	0.22-0.24	Low------	2.0-4.0	0.43	---	5	6
	7-29	35-60	1.25-1.45	0.06-0.60	0.10-0.18	High-----	0.5-2.0	0.32	---		
	29-60	24-35	1.30-1.60	0.20-2.00	0.20-0.22	Moderate	0.0-0.5	0.32	---		
137:											
Dovray----------	0-10	40-60	1.20-1.30	0.06-0.60	0.14-0.18	High-----	5.0-10	0.28	0.28	5	4
	10-43	40-60	1.20-1.30	0.06-0.60	0.13-0.16	High-----	1.0-3.0	0.37	0.37		
	43-54	40-60	1.20-1.30	0.06-0.60	0.13-0.16	High-----	0.0-1.0	0.37	0.37		
	54-60	25-60	1.20-1.40	0.06-0.20	0.13-0.19	High-----	0.0-0.5	0.37	0.37		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
141B:											
Egeland---------	0-9	10-18	1.25-1.35	2.00-6.00	0.11-0.17	Low------	1.0-3.0	0.20	0.20	5	3
	9-16	10-18	1.30-1.45	2.00-6.00	0.09-0.15	Low------	0.5-2.0	0.20	0.20		
	16-60	6-14	1.40-1.65	0.60-2.00	0.10-0.22	Low------	0.0-0.5	0.17	0.17		
141C:											
Egeland---------	0-13	10-18	1.25-1.35	2.00-6.00	0.11-0.17	Low------	1.0-3.0	0.20	0.20	5	3
	13-22	10-18	1.30-1.45	2.00-6.00	0.09-0.15	Low------	0.5-2.0	0.20	0.20		
	22-60	6-14	1.40-1.65	0.60-2.00	0.10-0.22	Low------	0.0-0.5	0.17	0.17		
168B:											
Forman----------	0-8	27-30	1.20-1.40	0.60-2.00	0.17-0.19	Moderate	4.0-8.0	0.24	0.28	5	6
	8-15	30-35	1.30-1.50	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.28	0.32		
	15-60	18-35	1.30-1.50	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.43		
168C2:											
Forman----------	0-7	27-30	1.20-1.40	0.60-2.00	0.17-0.19	Moderate	4.0-8.0	0.24	0.28	5	6
	7-16	30-35	1.30-1.50	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.28	0.32		
	16-60	18-35	1.30-1.50	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.43		
168D2:											
Forman----------	0-8	27-30	1.20-1.40	0.60-2.00	0.17-0.19	Moderate	4.0-8.0	0.24	0.28	5	6
	8-15	30-35	1.30-1.50	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.28	0.32		
	15-60	18-35	1.30-1.50	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.43		
168E:											
Forman----------	0-7	27-30	1.20-1.40	0.60-2.00	0.17-0.19	Moderate	4.0-8.0	0.24	0.28	5	6
	7-15	30-35	1.30-1.50	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.28	0.32		
	15-60	18-35	1.30-1.50	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.43		
171B:											
Formdale--------	0-8	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	8-14	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	14-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
180:											
Gonvick---------	0-12	10-27	1.30-1.45	0.60-2.00	0.20-0.22	Moderate	2.0-5.0	0.24	0.24	5	6
	12-34	22-35	1.35-1.50	0.20-2.00	0.15-0.19	Moderate	1.0-3.0	0.32	0.32		
	34-60	18-35	1.40-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
184:											
Hamerly---------	0-10	18-27	1.20-1.60	0.60-2.00	0.20-0.24	Low------	4.0-7.0	0.28	0.28	5	4L
	10-24	18-30	1.20-1.60	0.60-2.00	0.15-0.19	Low------	0.5-1.0	0.28	0.32		
	24-60	18-30	1.30-1.60	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.37	0.37		
191:											
Epoufette-------	0-6	5-15	1.35-1.50	2.00-6.00	0.09-0.14	Low------	2.0-6.0	0.20	---	4	3
	6-12	5-15	1.40-1.55	6.00-20.00	0.05-0.07	Low------	1.0-3.0	0.17	0.17		
	12-20	8-18	1.40-1.60	2.00-6.00	0.08-0.14	Low------	0.0-0.5	0.17	0.17		
	20-60	0-8	1.40-1.65	>20.00	0.01-0.03	Low------	0.0-0.5	0.10	0.15		
202:											
Meehan----------	0-13	4-10	1.35-1.65	2.00-6.00	0.10-0.12	Low------	0.5-3.0	0.17	0.17	5	2
	13-25	4-9	1.60-1.70	6.00-20.00	0.06-0.11	Low------	0.0-0.5	0.15	0.15		
	25-60	1-4	1.60-1.70	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
207D:											
Nymore----------	0-6	2-12	1.45-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.17	0.17	5	2
	6-46	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		
	46-60	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
267B:											
Snellman--------	0-2	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	2-16	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	16-31	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	31-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
267C:											
Snellman--------	0-3	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	3-16	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	16-28	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	28-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
267E:											
Snellman--------	0-2	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	2-14	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	14-28	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	28-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
315A:											
Bootlake--------	0-6	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	6-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	13-28	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	28-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
315B:											
Bootlake--------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-9	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	9-21	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	21-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
332B:											
Sugarbush-------	0-4	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	4-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	13-18	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	18-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
335:											
Urness----------	0-7	18-27	0.25-0.50	0.20-2.00	0.18-0.24	Moderate	10-50	0.28	0.28	5	4L
	7-60	18-35	0.30-1.00	0.20-2.00	0.16-0.22	Moderate	10-50	0.28	0.28		
339:											
Fordville-------	0-10	18-25	1.20-1.30	0.60-2.00	0.18-0.20	Low------	3.0-7.0	0.24	0.24	4	6
	10-17	18-30	1.25-1.40	0.60-2.00	0.18-0.21	Moderate	1.0-4.0	0.28	0.28		
	17-28	15-30	1.25-1.45	0.60-6.00	0.12-0.18	Low------	0.0-2.0	0.28	0.28		
	28-60	0-5	1.60-1.80	6.00-60.00	0.03-0.06	Low------	0.0-0.5	0.10	0.17		
344:											
Quam------------	0-10	28-35	1.00-1.35	0.20-0.60	0.18-0.22	Moderate	6.0-15	0.28	0.28	5	7
	10-42	22-35	1.25-1.45	0.20-0.60	0.16-0.22	Moderate	4.0-10	0.28	0.28		
	42-60	20-35	1.40-1.65	0.20-0.60	0.14-0.19	Moderate	1.0-3.0	0.37	0.37		
351:											
Colvin----------	0-12	27-34	1.20-1.50	0.20-0.60	0.20-0.22	Moderate	4.0-10	0.32	0.32	5	4L
	12-45	18-34	1.30-1.50	0.06-2.00	0.16-0.20	Moderate	0.0-5.0	0.32	0.32		
	45-60	18-34	1.30-1.40	0.06-2.00	0.15-0.20	Moderate	0.0-1.0	0.32	0.32		
375:											
Forada----------	0-14	10-22	1.20-1.40	0.60-2.00	0.20-0.22	Low------	5.0-9.0	0.24	0.24	4	5
	14-22	8-18	1.30-1.50	0.60-6.00	0.12-0.19	Low------	0.5-1.0	0.28	0.28		
	22-60	0-5	1.50-1.70	6.00-20.00	0.02-0.10	Low------	0.0-0.5	0.15	0.17		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
398:											
Winger	0-13	27-35	1.20-1.40	0.60-2.00	0.22-0.24	Low	4.0-6.0	0.28	0.28	5	4L
	13-37	18-35	1.30-1.50	0.60-2.00	0.22-0.24	Low	0.0-0.5	0.28	0.28		
	37-60	18-32	1.50-1.70	0.20-2.00	0.14-0.19	Low	---	0.28	0.28		
406A:											
Dorset	0-9	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low	3.0-5.0	0.20	0.20	4	3
	9-21	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low	1.0-2.0	0.28	0.28		
	21-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low	0.0-0.5	0.10	0.15		
406B:											
Dorset	0-10	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low	3.0-5.0	0.20	0.20	4	3
	10-17	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low	1.0-2.0	0.28	0.28		
	17-29	5-10	1.55-1.65	6.00-20.00	0.06-0.10	Low	0.0-0.5	0.10	0.17		
	29-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low	0.0-0.5	0.10	0.15		
413:											
Osakis	0-8	8-18	1.30-1.50	2.00-6.00	0.14-0.18	Low	2.0-4.0	0.28	0.28	3	3
	8-18	8-18	1.30-1.50	0.60-6.00	0.14-0.19	Low	0.5-1.0	0.28	0.28		
	18-60	0-5	1.50-1.70	6.00-20.00	0.02-0.04	Low	0.0-0.5	0.10	0.10		
418:											
Lamoure	0-39	27-34	1.15-1.25	0.20-2.00	0.19-0.22	Moderate	4.0-8.0	0.28	0.28	5	4L
	39-60	20-34	1.25-1.40	0.20-2.00	0.09-0.18	Moderate	0.0-0.5	0.28	0.28		
422B:											
Bygland	0-8	27-40	1.20-1.40	0.20-0.60	0.18-0.22	High	4.0-8.0	0.28	0.28	5	7
	8-22	35-60	1.20-1.40	0.06-0.60	0.10-0.19	High	1.0-3.0	0.32	0.32		
	22-38	18-40	1.30-1.50	0.20-0.60	0.16-0.22	Moderate	0.5-1.0	0.43	0.43		
	38-60	18-40	1.30-1.50	0.20-0.60	0.16-0.22	Moderate	0.0-0.5	0.43	0.43		
422C:											
Bygland	0-8	27-40	1.20-1.40	0.20-0.60	0.18-0.22	High	4.0-8.0	0.28	0.28	5	7
	8-16	35-60	1.20-1.40	0.06-0.60	0.10-0.19	High	1.0-3.0	0.32	0.32		
	16-25	18-40	1.30-1.50	0.20-0.60	0.16-0.22	Moderate	0.5-1.0	0.43	0.43		
	25-60	18-40	1.30-1.50	0.20-0.60	0.16-0.22	Moderate	0.0-0.5	0.43	0.43		
503B:											
Balmlake	0-3	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low	1.0-3.0	0.28	0.28	5	3
	3-20	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low	0.5-1.0	0.28	0.28		
	20-28	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low	0.0-0.5	0.37	0.37		
	28-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low	0.0-0.5	0.28	0.28		
503C:											
Balmlake	0-2	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low	1.0-3.0	0.28	0.28	5	3
	2-17	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low	0.5-1.0	0.28	0.28		
	17-29	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low	0.0-0.5	0.37	0.37		
	29-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low	0.0-0.5	0.28	0.28		
503E:											
Balmlake	0-2	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low	1.0-3.0	0.28	0.28	5	3
	2-15	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low	0.5-1.0	0.28	0.28		
	15-28	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low	0.0-0.5	0.37	0.37		
	28-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low	0.0-0.5	0.28	0.28		
508:											
Wyndmere	0-14	5-15	1.30-1.60	2.00-6.00	0.13-0.18	Low	5.0-13	0.20	0.20	5	3
	14-24	0-10	1.30-1.70	2.00-6.00	0.12-0.17	Low	1.0-8.0	0.20	0.20		
	24-60	0-10	1.30-1.70	2.00-6.00	0.06-0.16	Low	0.0-1.0	0.24	0.24		
540:											
Seelyeville	0-24	---	0.10-0.25	0.20-6.00	0.35-0.45	---	25-99	---	---	3	2
	24-60	---	0.10-0.25	0.20-6.00	0.35-0.45	---	25-99	---	---		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
541:											
Rifle----------	0-14	---	0.20-0.35	0.60-6.00	0.48-0.58	---	75-99	---	---	3	5
	14-60	---	0.08-0.20	0.60-6.00	0.48-0.58	---	25-99	---	---		
544:											
Cathro----------	0-8	---	0.28-0.45	0.20-6.00	0.45-0.55	---	60-85	---	---	2	2
	8-22	---	0.15-0.30	0.20-6.00	0.35-0.45	---	60-85	---	---		
	22-60	10-30	1.50-1.70	0.20-2.00	0.11-0.22	Low------	1.0-5.0	0.20	0.24		
564:											
Friendship------	0-3	3-8	1.50-1.65	6.00-20.00	0.08-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	3-31	0-4	1.50-1.65	6.00-20.00	0.05-0.08	Low------	0.0-0.5	0.15	0.15		
	31-60	0-4	1.50-1.70	6.00-20.00	0.04-0.07	Low------	0.0-0.5	0.15	0.15		
567A:											
Verndale--------	0-8	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	8-15	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	15-33	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	33-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
567B:											
Verndale--------	0-7	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	7-13	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	13-31	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	31-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
579C2:											
Formdale--------	0-7	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	7-11	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	11-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
Langhei---------	0-7	28-35	1.40-1.50	0.20-0.60	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	7-13	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.32	0.32		
	13-60	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.37	0.37		
Sandberg--------	0-8	5-15	1.35-1.55	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.17	0.17	3	3
	8-18	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.5-1.0	0.05	0.10		
	18-60	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.0-0.5	0.05	0.10		
624:											
Rosy------------	0-20	3-12	1.40-1.55	0.60-2.00	0.14-0.19	Low------	0.5-2.0	0.24	0.24	5	3
	20-26	8-18	1.50-1.65	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.28	0.28		
	26-60	6-18	1.55-1.70	0.60-2.00	0.11-0.17	Low------	0.0-0.5	0.28	0.28		
701:											
Runeberg--------	0-10	10-25	1.40-1.55	0.60-2.00	0.18-0.25	Low------	4.0-12	0.24	0.24	5	5
	10-36	10-18	1.60-1.75	0.20-0.60	0.12-0.18	Low------	0.5-2.0	0.24	0.24		
	36-60	6-15	1.65-1.75	0.06-0.60	0.06-0.13	Low------	0.0-0.5	0.24	0.24		
711B:											
Arvilla---------	0-8	6-18	1.40-1.60	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.20	0.20	3	3
	8-15	6-18	1.40-1.60	2.00-6.00	0.11-0.14	Low------	1.0-2.0	0.20	0.20		
	15-60	2-10	1.40-1.60	6.00-20.00	0.02-0.05	Low------	0.0-0.5	0.10	0.20		
Sandberg--------	0-8	5-15	1.35-1.55	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.17	0.17	3	3
	8-15	0-10	1.50-1.65	6.00-20.00	0.03-0.10	Low------	0.5-1.0	0.05	0.10		
	15-36	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.5-1.0	0.05	0.10		
	36-60	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.0-0.5	0.05	0.10		
711C:											
Arvilla---------	0-8	6-18	1.40-1.60	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.20	0.20	3	3
	8-15	6-18	1.40-1.60	2.00-6.00	0.11-0.14	Low------	1.0-2.0	0.20	0.20		
	15-60	2-10	1.40-1.60	6.00-20.00	0.02-0.05	Low------	0.0-0.5	0.10	0.20		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
711C:											
Sandberg--------	0-8	5-15	1.35-1.55	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.17	0.17	3	3
	8-15	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.5-1.0	0.05	0.10		
	15-60	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.0-0.5	0.05	0.10		
718B:											
Naytahwaush-----	0-4	10-20	1.30-1.55	0.60-2.00	0.20-0.24	Moderate	3.0-6.0	0.28	0.28	5	6
	4-7	8-15	1.30-1.50	0.20-2.00	0.16-0.24	Moderate	0.5-1.0	0.28	0.28		
	7-30	35-60	1.25-1.40	0.06-0.20	0.10-0.19	High-----	0.5-1.0	0.32	0.32		
	30-60	22-35	1.30-1.55	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
718C:											
Naytahwaush-----	0-4	10-20	1.30-1.55	0.60-2.00	0.20-0.24	Moderate	3.0-6.0	0.28	0.28	5	6
	4-6	8-15	1.30-1.50	0.20-2.00	0.16-0.24	Moderate	0.5-1.0	0.28	0.28		
	6-23	35-60	1.25-1.40	0.06-0.20	0.10-0.19	High-----	0.5-1.0	0.32	0.32		
	23-60	22-35	1.30-1.55	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
718E:											
Naytahwaush-----	0-3	10-20	1.30-1.55	0.60-2.00	0.20-0.24	Moderate	3.0-6.0	0.28	0.28	5	6
	3-7	8-15	1.30-1.50	0.20-2.00	0.16-0.24	Moderate	0.5-1.0	0.28	0.28		
	7-23	35-60	1.25-1.40	0.06-0.20	0.10-0.19	High-----	0.5-1.0	0.32	0.32		
	23-60	22-35	1.30-1.55	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
721E:											
Corliss---------	0-7	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	7-60	0-5	1.50-1.65	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
746:											
Haslie----------	0-8	---	0.10-0.30	0.60-6.00	0.35-0.48	---	60-90	---	---	1	2
	8-43	---	0.10-0.30	0.60-6.00	0.35-0.48	---	60-90	---	---		
	43-60	18-35	0.10-0.50	0.06-0.60	0.18-0.24	Moderate	6.0-20	0.28	0.28		
747B:											
Audubon---------	0-9	40-60	1.30-1.40	0.06-0.20	0.16-0.22	High-----	3.0-5.0	0.28	0.28	5	4
	9-29	35-60	1.30-1.40	0.06-0.20	0.13-0.19	High-----	0.5-1.0	0.43	0.43		
	29-60	35-60	1.40-1.50	0.06-0.20	0.11-0.16	High-----	0.0-0.5	0.43	0.43		
753D:											
Abbeylake-------	0-8	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	8-24	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	24-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
753E:											
Abbeylake-------	0-3	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	3-21	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	21-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
765:											
Smiley----------	0-13	8-20	1.20-1.50	0.60-2.00	0.20-0.24	Low------	2.0-5.0	0.24	0.24	5	5
	13-26	18-35	1.35-1.60	0.60-2.00	0.15-0.19	Moderate	0.5-2.0	0.24	0.24		
	26-47	16-32	1.40-1.70	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.24	0.24		
	47-60	16-32	1.40-1.70	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.24	0.24		
767:											
Auganaush-------	0-5	12-27	1.35-1.55	0.60-2.00	0.20-0.24	Low------	3.0-8.0	0.32	0.32	5	6
	5-8	5-18	1.40-1.60	0.60-2.00	0.16-0.24	Low------	1.0-3.0	0.24	0.24		
	8-22	35-60	1.25-1.50	0.06-0.60	0.10-0.19	High-----	0.0-0.5	0.28	0.28		
	22-60	30-45	1.30-1.55	0.06-0.60	0.14-0.19	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
775B:											
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	13-25	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	25-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
Two Inlets------	0-4	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-1.0	0.10	0.15	5	2
	4-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	13-27	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	27-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
775C:											
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-10	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	10-22	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	22-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
Two Inlets------	0-2	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-1.0	0.10	0.15	5	2
	2-10	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	10-27	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	27-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
776B:											
Snellman--------	0-3	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	3-12	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	12-32	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	32-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-17	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	17-28	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	28-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
776C:											
Snellman--------	0-2	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	2-16	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	16-32	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	32-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-14	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	14-21	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	21-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
776E:											
Snellman--------	0-3	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	3-14	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	14-26	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	26-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-10	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	10-19	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	19-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
778B:											
Dorset----------	0-10	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low------	3.0-5.0	0.20	0.20	4	3
	10-20	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low------	1.0-2.0	0.28	0.28		
	20-24	5-10	1.55-1.65	6.00-20.00	0.06-0.10	Low------	0.0-0.5	0.10	0.17		
	24-60	0-5	1.55-1.65	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
778B:											
Corliss---------	0-5	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	5-13	0-10	1.50-1.65	6.00-20.00	0.03-0.10	Low------	0.0-0.5	0.10	0.15		
	13-60	0-5	1.50-1.65	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
778C:											
Dorset----------	0-9	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low------	3.0-5.0	0.20	0.20	4	3
	9-15	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low------	1.0-2.0	0.28	0.28		
	15-18	5-10	1.55-1.65	6.00-20.00	0.06-0.10	Low------	0.0-0.5	0.10	0.17		
	18-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
Corliss---------	0-5	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	5-60	0-5	1.50-1.65	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
780B:											
Audubon---------	0-9	40-60	1.30-1.40	0.06-0.20	0.16-0.22	High-----	3.0-5.0	0.28	0.28	5	4
	9-27	35-60	1.30-1.40	0.06-0.20	0.13-0.19	High-----	0.5-1.0	0.43	0.43		
	27-60	35-60	1.40-1.50	0.06-0.20	0.11-0.16	High-----	0.0-0.5	0.43	0.43		
Boyerlake-------	0-9	35-40	1.40-1.50	0.06-0.20	0.16-0.19	Moderate	1.0-3.0	0.24	0.24	5	4
	9-17	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.5-1.0	0.37	0.37		
	17-60	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.0-0.5	0.37	0.37		
780C2:											
Audubon---------	0-10	40-60	1.30-1.40	0.06-0.20	0.16-0.22	High-----	3.0-5.0	0.28	0.28	5	4
	10-20	35-60	1.30-1.40	0.06-0.20	0.13-0.19	High-----	0.5-1.0	0.43	0.43		
	20-60	35-60	1.40-1.50	0.06-0.20	0.11-0.16	High-----	0.0-0.5	0.43	0.43		
Boyerlake-------	0-9	35-40	1.40-1.50	0.06-0.20	0.16-0.19	Moderate	1.0-3.0	0.24	0.24	5	4
	9-19	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.5-1.0	0.37	0.37		
	19-60	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.0-0.5	0.37	0.37		
780D2:											
Audubon---------	0-10	40-60	1.30-1.40	0.06-0.20	0.16-0.22	High-----	3.0-5.0	0.28	0.28	5	4
	10-22	35-60	1.30-1.40	0.06-0.20	0.13-0.19	High-----	0.5-1.0	0.43	0.43		
	22-60	35-60	1.40-1.50	0.06-0.20	0.11-0.16	High-----	0.0-0.5	0.43	0.43		
Boyerlake-------	0-7	35-40	1.40-1.50	0.06-0.20	0.16-0.19	Moderate	1.0-3.0	0.24	0.24	5	4
	7-37	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.5-1.0	0.37	0.37		
	37-60	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.0-0.5	0.37	0.37		
785:											
Hamerly---------	0-8	27-35	1.20-1.50	0.60-2.00	0.17-0.22	Moderate	4.0-7.0	0.28	0.28	5	4L
	8-33	18-35	1.20-1.60	0.60-2.00	0.15-0.19	Moderate	---	0.28	0.32		
	33-60	18-35	1.30-1.60	0.20-0.60	0.14-0.19	Moderate	---	0.37	0.37		
Winger----------	0-15	27-35	1.20-1.40	0.60-2.00	0.22-0.24	Low------	4.0-6.0	0.28	0.28	5	4L
	15-22	18-35	1.30-1.50	0.60-2.00	0.22-0.24	Low------	---	0.28	0.28		
	22-60	18-32	1.50-1.70	0.20-2.00	0.14-0.19	Low------	---	0.28	0.28		
786:											
Winger----------	0-14	27-35	1.20-1.40	0.60-2.00	0.22-0.24	Low------	4.0-6.0	0.28	0.28	5	4L
	14-33	18-35	1.30-1.50	0.60-2.00	0.22-0.24	Low------	---	0.28	0.28		
	33-60	18-32	1.50-1.70	0.20-2.00	0.14-0.19	Low------	---	0.28	0.28		
Hamerly---------	0-9	27-35	1.20-1.50	0.60-2.00	0.17-0.22	Moderate	4.0-7.0	0.28	0.28	5	4L
	9-18	18-35	1.20-1.60	0.60-2.00	0.15-0.19	Moderate	---	0.28	0.32		
	18-60	18-35	1.30-1.60	0.20-0.60	0.14-0.19	Moderate	---	0.37	0.37		
Colvin----------	0-15	27-34	1.20-1.50	0.20-0.60	0.20-0.22	Moderate	4.0-10	0.32	0.32	5	4L
	15-38	18-34	1.30-1.50	0.06-2.00	0.16-0.20	Moderate	0.0-5.0	0.32	0.32		
	38-60	18-34	1.30-1.40	0.06-2.00	0.15-0.20	Moderate	0.0-1.0	0.32	0.32		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
797:											
Mooselake-------	0-15	---	0.05-0.30	0.60-6.00	0.35-0.55	---	25-99	---	---	3	5
	15-60	---	0.10-0.20	0.60-6.00	0.40-0.50	---	25-99	---	---		
Lupton----------	0-15	---	0.10-0.35	0.20-6.00	0.35-0.45	---	70-90	---	---	3	2
	15-60	---	0.10-0.35	0.20-6.00	0.35-0.45	---	50-90	---	---		
867B:											
Graycalm--------	0-6	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	6-21	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	21-46	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
	46-60	0-10	1.50-1.65	6.00-20.00	0.04-0.06	Low------	0.0-0.5	0.10	0.15		
Menahga---------	0-3	2-10	1.20-1.50	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.15	0.15	5	2
	3-42	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.5-1.0	0.15	0.15		
	42-60	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
867C:											
Graycalm--------	0-6	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	6-26	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	26-55	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
	55-60	0-10	1.50-1.65	6.00-20.00	0.04-0.06	Low------	0.0-0.5	0.10	0.15		
Menahga---------	0-2	2-10	1.20-1.50	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.15	0.15	5	2
	2-40	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.5-1.0	0.15	0.15		
	40-60	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
867E:											
Graycalm--------	0-3	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	3-37	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	37-60	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
Menahga---------	0-12	2-10	1.20-1.50	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.15	0.15	5	2
	12-52	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.5-1.0	0.15	0.15		
	52-60	0-5	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
903B:											
Barnes----------	0-9	18-27	1.40-1.50	0.60-2.00	0.18-0.24	Low------	2.0-5.0	0.28	0.32	5	6
	9-19	18-27	1.50-1.60	0.60-2.00	0.15-0.19	Low------	0.5-1.0	0.28	0.32		
	19-60	18-27	1.50-1.60	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.37	0.43		
Langhei---------	0-6	18-27	1.40-1.50	0.60-2.00	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	6-17	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
	17-60	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
903C2:											
Barnes----------	0-8	18-27	1.40-1.50	0.60-2.00	0.18-0.24	Low------	2.0-5.0	0.28	0.32	5	6
	8-19	18-27	1.50-1.60	0.60-2.00	0.15-0.19	Low------	0.5-1.0	0.28	0.32		
	19-60	18-27	1.50-1.60	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.37	0.43		
Langhei---------	0-7	18-27	1.40-1.50	0.60-2.00	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	7-16	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
	16-60	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
931C2:											
Formdale--------	0-7	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	7-15	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	15-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
Langhei---------	0-8	28-35	1.40-1.50	0.20-0.60	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	8-19	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.32	0.32		
	19-60	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.37	0.37		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
942D2:											
Langhei---------	0-7	18-27	1.40-1.50	0.60-2.00	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	7-11	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
	11-60	18-32	1.50-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
Barnes----------	0-7	18-27	1.40-1.50	0.60-2.00	0.18-0.24	Low------	2.0-5.0	0.28	0.32	5	6
	7-15	18-27	1.50-1.60	0.60-2.00	0.15-0.19	Low------	0.5-1.0	0.28	0.32		
	15-60	18-27	1.50-1.60	0.60-2.00	0.14-0.19	Low------	0.0-0.5	0.37	0.43		
943D2:											
Langhei---------	0-6	28-35	1.40-1.50	0.20-0.60	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	6-13	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.32	0.32		
	13-60	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.37	0.37		
Formdale--------	0-7	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	7-14	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	14-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
943E:											
Langhei---------	0-8	28-35	1.40-1.50	0.20-0.60	0.17-0.22	Low------	0.5-3.0	0.32	0.32	5	4L
	8-60	28-35	1.50-1.65	0.20-0.60	0.14-0.19	Low------	0.0-0.5	0.32	0.32		
Formdale--------	0-8	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	8-16	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	16-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
951B:											
Nebish----------	0-2	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low------	1.0-2.0	0.32	0.32	5	5
	2-7	5-12	1.40-1.65	2.00-6.00	0.11-0.19	Low------	0.5-1.0	0.24	0.24		
	7-26	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	26-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low------	0.0-0.5	0.32	0.32		
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-9	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	9-17	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	17-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
951C:											
Nebish----------	0-3	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low------	1.0-2.0	0.32	0.32	5	5
	3-11	5-12	1.40-1.65	2.00-6.00	0.11-0.19	Low------	0.5-1.0	0.24	0.24		
	11-26	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	26-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low------	0.0-0.5	0.32	0.32		
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-9	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	9-15	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	15-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
951E:											
Nebish----------	0-3	5-20	1.30-1.45	0.60-2.00	0.20-0.22	Low------	1.0-2.0	0.32	0.32	5	5
	3-11	5-12	1.40-1.65	2.00-6.00	0.11-0.19	Low------	0.5-1.0	0.24	0.24		
	11-27	22-35	1.50-1.65	0.60-2.00	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	27-60	18-30	1.50-1.70	0.60-2.00	0.11-0.19	Low------	0.0-0.5	0.32	0.32		
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-8	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	8-16	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	16-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
1015:											
Udipsamments-----	0-14	1-15	1.50-1.70	2.00-20.00	0.05-0.10	Low------	---	0.15	0.15	5	2
	14-60	1-10	1.50-1.70	6.00-20.00	0.05-0.08	Low------	---	0.10	0.10		
	60-80	1-10	1.50-1.70	>20.00	0.03-0.05	Low------	---	0.05	0.10		

Low------

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1016:											
Udorthents------	0-60	---	---	---	---	---	---	---	---	---	---
	60-80	---	---	0.06-6.00	---	---	---	---	---		
1027:											
Udorthents.											
1030:											
Pits.											
Udipsamments----	0-14	1-15	1.50-1.70	2.00-20.00	0.05-0.10	Low------	---	0.15	0.15	5	2
	14-60	1-10	1.50-1.70	6.00-20.00	0.05-0.08	Low------	---	0.10	0.10		
	60-80	1-10	1.50-1.70	>20.00	0.03-0.05	Low------	---	0.05	0.10		
1104B:											
Waukon----------	0-9	12-27	1.40-1.60	0.60-2.00	0.20-0.24	Moderate	2.0-6.0	0.24	0.24	5	6
	9-17	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.32		
	17-60	18-30	1.45-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
Dorset----------	0-8	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low------	3.0-5.0	0.20	0.20	4	3
	8-14	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low------	1.0-2.0	0.28	0.28		
	14-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
1104C:											
Waukon----------	0-8	12-27	1.40-1.60	0.60-2.00	0.20-0.24	Moderate	2.0-6.0	0.24	0.24	5	6
	8-21	18-35	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	0.0-0.5	0.32	0.32		
	21-60	18-30	1.45-1.65	0.60-2.00	0.15-0.19	Low------	0.0-0.5	0.32	0.32		
Dorset----------	0-7	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low------	3.0-5.0	0.20	0.20	4	3
	7-16	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low------	1.0-2.0	0.28	0.28		
	16-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
1111:											
Nidaros----------	0-24	---	0.15-0.45	0.20-6.00	0.35-0.45	---	55-85	---	---	2	2
	24-38	8-35	1.50-1.80	0.60-2.00	0.13-0.22	Low------	5.0-15	0.20	0.24		
	38-60	0-4	1.40-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.15		
1113:											
Haslie----------	0-20	---	0.10-0.30	0.60-6.00	0.35-0.48	---	60-90	---	---	1	8
	20-60	18-35	0.10-0.50	0.06-0.60	0.18-0.24	Moderate	6.0-20	0.28	0.28		
Seelyeville-----	0-18	---	0.10-0.25	0.20-6.00	0.35-0.45	---	25-99	---	---	3	8
	18-60	---	0.10-0.25	0.20-6.00	0.35-0.45	---	25-99	---	---		
Cathro----------	0-23	---	0.28-0.45	0.20-6.00	0.45-0.55	---	60-85	---	---	2	8
	23-60	10-30	1.50-1.70	0.20-2.00	0.11-0.22	Low------	1.0-5.0	---	---		
1125B:											
Sverdrup--------	0-10	10-18	1.35-1.50	2.00-6.00	0.13-0.15	Low------	2.0-4.0	0.20	0.20	4	3
	10-25	6-18	1.40-1.55	2.00-6.00	0.08-0.14	Low------	1.0-3.0	0.20	0.20		
	25-60	0-10	1.50-1.65	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.15	0.15		
Abbeylake-------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	9-28	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	28-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
1125C:											
Sverdrup--------	0-10	10-18	1.35-1.50	2.00-6.00	0.13-0.15	Low------	2.0-4.0	0.20	0.20	4	3
	10-41	6-18	1.40-1.55	2.00-6.00	0.08-0.14	Low------	1.0-3.0	0.20	0.20		
	41-60	0-10	1.50-1.65	6.00-20.00	0.02-0.06	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1125C:											
Abbeylake-------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	9-26	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	26-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
1126B:											
Verndale--------	0-8	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	8-15	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	15-47	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	47-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
Nymore----------	0-7	2-12	1.45-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.17	0.17	5	2
	7-41	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		
	41-60	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		
1127A:											
Bootlake--------	0-7	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	7-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	13-18	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	18-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
Graycalm--------	0-7	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	7-22	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	22-56	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
	56-60	0-10	1.50-1.65	6.00-20.00	0.04-0.06	Low------	0.0-0.5	0.10	0.15		
1127B:											
Bootlake--------	0-6	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	6-10	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	10-16	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	16-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
Graycalm--------	0-6	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	6-37	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	37-60	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
1128:											
Cathro----------	0-8	---	0.28-0.45	0.20-6.00	0.45-0.55	---	50-95	---	---	2	2
	8-22	---	0.18-0.35	0.20-6.00	0.35-0.45	---	50-95	---	---		
	22-60	6-30	1.40-1.70	0.60-20.00	0.10-0.20	Low------	---	0.24	0.24		
1129:											
Lindaas---------	0-14	27-35	1.10-1.30	0.60-2.00	0.14-0.17	Moderate	4.0-7.0	0.28	0.28	5	7
	14-29	35-60	1.20-1.40	0.06-0.20	0.10-0.14	High-----	2.0-4.0	0.32	0.32		
	29-60	25-40	1.20-1.50	0.20-0.60	0.11-0.15	Moderate	0.5-1.0	0.32	0.32		
1130:											
Wolverton-------	0-8	10-20	1.20-1.40	2.00-6.00	0.16-0.20	Low------	2.0-4.0	0.28	0.28	5	3
	8-12	5-15	1.30-1.50	2.00-20.00	0.06-0.09	Low------	0.5-1.0	0.20	0.20		
	12-41	2-10	1.30-1.60	2.00-20.00	0.05-0.07	Low------	0.0-0.5	0.20	0.20		
	41-60	18-35	1.40-1.60	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.28	0.32		
1131B:											
Verndale--------	0-12	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	12-16	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	16-35	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	35-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
Abbeylake-------	0-7	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	7-22	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	22-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1132B:											
Eagleview-------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	9-28	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	28-48	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	48-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Balmlake--------	0-7	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.28	0.28	5	3
	7-17	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low------	0.5-1.0	0.28	0.28		
	17-24	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low------	0.0-0.5	0.37	0.37		
	24-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low------	0.0-0.5	0.28	0.28		
1132C:											
Eagleview-------	0-7	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	7-23	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	23-37	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	37-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Balmlake--------	0-3	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.28	0.28	5	3
	3-22	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low------	0.5-1.0	0.28	0.28		
	22-29	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low------	0.0-0.5	0.37	0.37		
	29-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low------	0.0-0.5	0.28	0.28		
1132E:											
Eagleview-------	0-3	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	3-15	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	15-46	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	46-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Balmlake--------	0-3	3-12	1.25-1.40	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.28	0.28	5	3
	3-17	3-12	1.30-1.50	2.00-6.00	0.10-0.17	Low------	0.5-1.0	0.28	0.28		
	17-27	8-18	1.35-1.55	0.60-2.00	0.13-0.20	Low------	0.0-0.5	0.37	0.37		
	27-60	6-14	1.30-1.65	0.60-2.00	0.10-0.22	Low------	0.0-0.5	0.28	0.28		
1135:											
Foxlake---------	0-19	35-60	1.30-1.40	0.06-0.20	0.18-0.22	High-----	3.0-5.0	0.28	0.28	5	4
	19-38	35-60	1.30-1.40	0.06-0.20	0.16-0.19	High-----	1.0-3.0	0.43	0.43		
	38-49	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.5-1.0	0.43	0.43		
	49-60	35-60	1.40-1.50	0.06-0.20	0.16-0.19	High-----	0.0-0.5	0.43	0.43		
1136:											
Nidaros---------	0-31	---	0.15-0.45	0.20-6.00	0.35-0.45	---	55-85	---	---	2	2
	31-49	8-35	1.50-1.80	0.60-2.00	0.13-0.22	Low------	5.0-15	0.20	0.24		
	49-60	0-4	1.40-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.15		
1137B:											
Birchlake-------	0-8	30-40	1.30-1.40	0.20-0.60	0.18-0.22	Moderate	3.0-5.0	0.32	0.32	5	7
	8-27	35-60	1.30-1.40	0.06-0.20	0.13-0.16	High-----	0.5-1.0	0.32	0.32		
	27-60	30-40	1.40-1.60	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
	40-80	30-40	1.45-1.65	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
1137C:											
Birchlake-------	0-8	30-40	1.30-1.40	0.20-0.60	0.18-0.22	Moderate	3.0-5.0	0.32	0.32	5	7
	8-17	35-60	1.30-1.40	0.06-0.20	0.13-0.16	High-----	0.5-1.0	0.32	0.32		
	17-60	30-40	1.40-1.60	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
	40-80	30-40	1.45-1.65	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
1137D:											
Birchlake-------	0-7	30-40	1.30-1.40	0.20-0.60	0.18-0.22	Moderate	3.0-5.0	0.32	0.32	5	7
	7-15	35-60	1.30-1.40	0.06-0.20	0.13-0.16	High-----	0.5-1.0	0.32	0.32		
	15-60	30-40	1.40-1.60	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
	40-80	30-40	1.45-1.65	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1137E:											
Birchlake--------	0-7	30-40	1.30-1.40	0.20-0.60	0.18-0.22	Moderate	3.0-5.0	0.32	0.32	5	7
	7-16	35-60	1.30-1.40	0.06-0.20	0.13-0.16	High-----	0.5-1.0	0.32	0.32		
	16-60	30-40	1.40-1.60	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
	40-80	30-40	1.45-1.65	0.06-0.20	0.16-0.19	Moderate	0.0-0.5	0.43	0.43		
1138:											
Rushlake---------	0-7	3-10	1.50-1.70	6.00-20.00	0.10-0.12	Low------	0.5-4.0	0.17	0.17	5	2
	7-60	1-10	1.50-1.70	6.00-20.00	0.02-0.10	Low------	0.0-0.5	0.05	0.10		
Hangaard---------	0-13	8-18	1.25-1.45	2.00-6.00	0.10-0.14	Low------	3.0-8.0	0.20	0.20	5	3
	13-60	2-10	1.50-1.70	6.00-40.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
1140B:											
Eagleview--------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	9-22	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	22-40	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	40-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Snellman---------	0-7	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	7-18	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	18-34	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	34-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1140C:											
Eagleview--------	0-10	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	10-30	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	30-49	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	49-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Snellman---------	0-3	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	3-11	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	11-21	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	21-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1149:											
Hamerly----------	0-10	27-35	1.20-1.50	0.60-2.00	0.17-0.22	Moderate	4.0-7.0	0.28	0.28	5	4L
	10-26	18-35	1.20-1.60	0.60-2.00	0.15-0.19	Moderate	---	0.28	0.32		
	26-60	18-35	1.30-1.60	0.20-0.60	0.14-0.19	Moderate	---	0.37	0.37		
1195B:											
Sybil------------	0-5	3-10	1.35-1.65	6.00-20.00	0.07-0.12	Low------	1.0-4.0	0.17	0.17	5	2
	5-10	3-15	1.35-1.65	2.00-20.00	0.10-0.18	Low------	0.0-0.5	0.17	0.17		
	10-15	8-18	1.45-1.65	2.00-6.00	0.12-0.17	Low------	0.5-1.0	0.24	0.24		
	15-32	3-10	1.50-1.65	6.00-20.00	0.06-0.11	Low------	0.0-0.5	0.15	0.17		
	32-60	2-5	1.55-1.70	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.10	0.15		
Eagleview--------	0-7	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	7-19	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	19-33	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	33-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1195C:											
Sybil------------	0-8	3-10	1.35-1.65	6.00-20.00	0.07-0.12	Low------	1.0-4.0	0.17	0.17	5	2
	8-17	3-15	1.35-1.65	2.00-20.00	0.10-0.18	Low------	0.0-0.5	0.17	0.17		
	17-26	8-18	1.45-1.65	2.00-6.00	0.12-0.17	Low------	0.5-1.0	0.24	0.24		
	26-37	3-10	1.50-1.65	6.00-20.00	0.06-0.11	Low------	0.0-0.5	0.15	0.17		
	37-60	2-5	1.55-1.70	6.00-20.00	0.05-0.07	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1195C:											
Eagleview-------	0-4	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	4-15	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	15-28	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	28-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1195E:											
Sybil----------	0-4	5-18	1.40-1.60	2.00-6.00	0.13-0.18	Low------	2.0-4.0	0.20	0.20	5	3
	4-15	3-15	1.35-1.65	2.00-20.00	0.10-0.18	Low------	0.0-0.5	0.17	0.17		
	15-19	8-18	1.45-1.65	2.00-6.00	0.12-0.17	Low------	0.5-1.0	0.24	0.24		
	19-25	3-10	1.50-1.65	6.00-20.00	0.06-0.11	Low------	0.0-0.5	0.15	0.17		
	25-60	2-5	1.55-1.70	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.10	0.15		
Eagleview-------	0-5	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	5-22	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	22-39	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	39-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1196B:											
Lida----------	0-9	5-18	1.40-1.60	2.00-6.00	0.13-0.18	Low------	2.0-4.0	0.17	0.20	5	3
	9-13	3-15	1.40-1.60	2.00-20.00	0.08-0.13	Low------	0.0-0.5	0.10	0.17		
	13-25	8-18	1.45-1.65	2.00-6.00	0.08-0.17	Low------	0.5-1.0	0.15	0.24		
	25-45	1-5	1.55-1.70	6.00-20.00	0.02-0.10	Low------	0.0-0.5	0.05	0.15		
	45-60	1-5	1.60-1.70	6.00-20.00	0.01-0.07	Low------	0.0-0.5	0.05	0.10		
Two Inlets------	0-7	5-10	1.40-1.60	2.00-6.00	0.10-0.15	Low------	1.0-2.0	0.10	0.15	5	3
	7-14	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	14-29	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	29-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
1196C:											
Lida----------	0-8	5-18	1.40-1.60	2.00-6.00	0.13-0.18	Low------	2.0-4.0	0.17	0.20	5	3
	8-17	3-15	1.40-1.60	2.00-20.00	0.08-0.13	Low------	0.0-0.5	0.10	0.17		
	17-25	8-18	1.45-1.65	2.00-6.00	0.08-0.17	Low------	0.5-1.0	0.15	0.24		
	25-41	1-5	1.55-1.70	6.00-20.00	0.02-0.10	Low------	0.0-0.5	0.05	0.15		
	41-60	1-5	1.60-1.70	6.00-20.00	0.01-0.07	Low------	0.0-0.5	0.05	0.10		
Two Inlets------	0-4	5-10	1.40-1.60	2.00-6.00	0.10-0.15	Low------	1.0-2.0	0.10	0.15	5	3
	4-9	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	9-38	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	38-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
1196E:											
Lida----------	0-3	5-18	1.40-1.60	2.00-6.00	0.13-0.18	Low------	2.0-4.0	0.17	0.20	5	3
	3-14	3-15	1.40-1.60	2.00-20.00	0.08-0.13	Low------	0.0-0.5	0.10	0.17		
	14-20	8-18	1.45-1.65	2.00-6.00	0.08-0.17	Low------	0.5-1.0	0.15	0.24		
	20-27	1-5	1.55-1.70	6.00-20.00	0.02-0.10	Low------	0.0-0.5	0.05	0.15		
	27-60	1-5	1.60-1.70	6.00-20.00	0.01-0.07	Low------	0.0-0.5	0.05	0.10		
Two Inlets------	0-3	5-10	1.40-1.60	2.00-6.00	0.10-0.15	Low------	1.0-2.0	0.10	0.15	5	3
	3-7	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	7-21	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	21-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
1200:											
Egglake---------	0-4	8-15	1.35-1.60	0.60-6.00	0.10-0.21	Low------	2.0-4.0	0.28	0.28	5	5
	4-9	3-10	1.50-1.70	0.60-6.00	0.12-0.14	Low------	0.5-2.0	0.24	0.24		
	9-20	18-30	1.50-1.70	0.60-2.00	0.16-0.18	Moderate	0.0-0.5	0.32	0.32		
	20-60	10-18	1.60-1.80	0.60-2.00	0.11-0.13	Low------	0.0-0.5	0.24	0.24		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1201C:											
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-14	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	14-24	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	24-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
Snellman--------	0-2	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	2-14	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	14-29	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	29-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1201E:											
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-11	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	11-15	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	15-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
Snellman--------	0-2	5-18	1.35-1.60	0.60-6.00	0.13-0.18	Low------	1.0-3.0	0.20	0.20	5	3
	2-15	5-15	1.50-1.70	0.60-2.00	0.09-0.14	Low------	0.5-2.0	0.28	0.28		
	15-28	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.0-0.5	0.28	0.28		
	28-60	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
	41-80	7-18	1.60-1.80	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1210:											
Paddock---------	0-9	8-15	1.45-1.75	0.60-2.00	0.13-0.18	Low------	2.0-6.0	0.24	0.24	4	3
	9-16	3-10	1.50-1.75	0.60-2.00	0.12-0.16	Low------	---	0.24	0.24		
	16-29	8-18	1.60-1.80	0.20-0.60	0.12-0.16	Low------	---	0.24	0.24		
	29-60	6-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		
Epoufette-------	0-8	5-15	1.35-1.50	2.00-6.00	0.09-0.14	Low------	2.0-6.0	0.20	---	4	3
	8-17	5-15	1.40-1.55	6.00-20.00	0.05-0.07	Low------	1.0-3.0	0.17	0.17		
	17-25	8-18	1.40-1.60	2.00-6.00	0.08-0.14	Low------	0.0-0.5	0.17	0.17		
	25-60	0-8	1.40-1.65	>20.00	0.01-0.03	Low------	0.0-0.5	0.10	0.15		
1211:											
Egglake---------	0-4	5-15	1.35-1.60	0.60-6.00	0.13-0.15	Low------	2.0-4.0	0.20	0.20	5	3
	4-9	3-10	1.50-1.70	0.60-6.00	0.12-0.14	Low------	0.5-2.0	0.24	0.24		
	9-25	18-30	1.50-1.70	0.60-2.00	0.16-0.18	Moderate	0.0-0.5	0.32	0.32		
	25-60	10-18	1.60-1.80	0.60-2.00	0.11-0.13	Low------	0.0-0.5	0.24	0.24		
Cathro----------	0-17	---	0.28-0.45	0.20-6.00	0.45-0.55	---	60-85	---	---	2	2
	17-60	10-30	1.50-1.70	0.20-2.00	0.11-0.22	Low------	1.0-5.0	0.20	0.24		
1225:											
Wykeham---------	0-8	5-18	1.30-1.55	0.60-6.00	0.13-0.18	Low------	2.0-6.0	0.17	0.20	5	3
	8-16	5-15	1.50-1.70	0.60-2.00	0.10-0.17	Low------	1.0-2.0	0.24	0.28		
	16-37	18-30	1.50-1.70	0.60-2.00	0.12-0.18	Moderate	0.5-1.0	0.24	0.28		
	37-60	10-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.24	0.28		
Karlstad--------	0-12	5-15	1.20-1.45	2.00-6.00	0.13-0.18	Low------	1.0-4.0	0.24	0.24	3	3
	12-18	5-18	1.35-1.60	2.00-6.00	0.13-0.18	Low------	0.5-2.0	0.24	0.24		
	18-29	5-18	1.50-1.70	2.00-6.00	0.12-0.16	Low------	0.0-0.5	0.10	0.17		
	29-60	1-5	1.50-1.70	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.17		
1227:											
Quam------------	0-33	22-27	1.00-1.40	0.60-2.00	0.22-0.24	Low------	6.0-15	0.28	0.28	5	6
	33-50	22-35	1.25-1.45	0.20-0.60	0.16-0.22	Moderate	4.0-10	0.28	0.28		
	50-60	20-35	1.40-1.65	0.20-0.60	0.14-0.19	Moderate	1.0-3.0	0.37	0.37		
Cathro----------	0-24	---	0.28-0.45	0.20-6.00	0.45-0.55	---	60-85	---	---	2	8
	24-60	10-30	1.50-1.70	0.20-2.00	0.11-0.22	Low------	1.0-5.0	---	---		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1227:											
Urness----------	0-20	18-27	0.25-0.50	0.20-2.00	0.18-0.24	Moderate	10-50	0.28	0.28	5	4L
	20-45	18-35	0.30-1.00	0.20-2.00	0.16-0.22	Moderate	10-50	0.28	0.28		
	45-60	18-35	1.00-1.65	0.20-2.00	0.14-0.20	Moderate	---	0.28	0.28		
1230:											
Haslie----------	0-18	---	0.10-0.30	0.60-6.00	0.35-0.48	---	60-90	---	---	1	8
	18-60	18-35	0.10-0.50	0.06-0.60	0.18-0.24	Moderate	6.0-20	0.28	0.28		
Nidaros---------	0-38	---	0.15-0.45	0.20-6.00	0.35-0.45	---	55-85	---	---	2	8
	38-54	8-35	1.50-1.80	0.60-2.00	0.13-0.22	Low------	5.0-15	0.20	0.24		
	54-60	0-4	1.40-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.15		
1234B:											
Formdale--------	0-8	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	8-15	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	15-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
Buse------------	0-7	27-35	1.40-1.50	0.20-0.60	0.17-0.22	Moderate	1.0-3.0	0.28	0.28	5	4L
	7-60	18-35	1.55-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-1.0	0.37	0.37		
1235B:											
Formdale--------	0-8	27-35	1.30-1.50	0.60-2.00	0.17-0.19	Moderate	2.0-5.0	0.24	0.24	5	6
	8-11	24-35	1.40-1.60	0.20-0.60	0.17-0.19	Moderate	0.5-2.0	0.37	0.37		
	11-60	18-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.37	0.37		
Buse------------	0-8	18-27	1.40-1.50	0.20-0.60	0.17-0.20	Low------	1.0-3.0	0.28	0.28	5	4L
	8-60	18-35	1.55-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-1.0	0.37	0.37		
Sandberg--------	0-8	5-15	1.35-1.55	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.17	0.17	3	3
	8-12	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.5-1.0	0.05	0.10		
	12-60	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.0-0.5	0.05	0.10		
1236B:											
Eagleview-------	0-2	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	2-11	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	11-48	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	48-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1236C:											
Eagleview-------	0-7	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	7-23	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	23-37	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	37-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1236E:											
Eagleview-------	0-3	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	3-16	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	16-40	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	40-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
1238E:											
Two Inlets------	0-2	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-1.0	0.10	0.15	5	2
	2-10	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	10-33	5-15	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.10	0.15		
	33-60	0-3	1.60-1.80	20.00-40.00	0.02-0.04	Low------	0.0-0.5	0.05	0.10		
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-12	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	12-18	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	18-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1242D:											
Sandberg--------	0-7	5-15	1.35-1.55	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.17	0.17	3	3
	7-19	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.5-1.0	0.05	0.10		
	19-60	0-5	1.50-1.65	>20.00	0.02-0.06	Low------	0.0-0.5	0.05	0.10		
Arvilla---------	0-7	6-18	1.40-1.60	2.00-6.00	0.13-0.15	Low------	1.0-4.0	0.20	0.20	3	3
	7-17	6-18	1.40-1.60	2.00-6.00	0.11-0.14	Low------	1.0-2.0	0.20	0.20		
	17-60	2-10	1.40-1.60	6.00-20.00	0.02-0.05	Low------	0.0-0.5	0.10	0.20		
1243B:											
Sol----------	0-3	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	3-17	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	17-30	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	30-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1243C:											
Sol----------	0-2	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	2-18	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	18-30	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	30-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1243E:											
Sol----------	0-3	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	3-18	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	18-36	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	36-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
1244B:											
Sol----------	0-2	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	2-21	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	21-30	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	30-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-13	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	13-21	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	21-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
1244C:											
Sol----------	0-2	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	2-22	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	22-31	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	31-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-2	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	2-18	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	18-38	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	38-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
1244E:											
Sol----------	0-3	4-16	1.50-1.65	0.60-2.00	0.12-0.20	Low------	1.0-3.0	0.24	0.24	5	8
	3-23	2-12	1.40-1.55	2.00-6.00	0.09-0.13	Low------	0.0-0.5	0.17	0.17		
	23-30	18-27	1.55-1.75	0.60-2.00	0.16-0.20	Moderate	0.0-0.5	0.32	0.32		
	30-60	8-18	1.55-1.75	0.60-2.00	0.11-0.16	Low------	0.0-0.5	0.28	0.28		
Sugarbush-------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-17	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	17-47	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	47-60	1-5	1.60-1.80	20.00-40.00	0.02-0.06	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1246:											
Winger----------	0-15	27-35	1.20-1.40	0.60-2.00	0.22-0.24	Low------	4.0-6.0	0.28	0.28	5	4L
	15-37	18-35	1.30-1.50	0.60-2.00	0.22-0.24	Low------	---	0.28	0.28		
	37-60	18-32	1.50-1.70	0.20-2.00	0.14-0.19	Low------	---	0.28	0.28		
1247D:											
Corliss---------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	9-16	0-10	1.50-1.65	6.00-20.00	0.03-0.10	Low------	0.0-0.5	0.10	0.15		
	16-60	0-5	1.50-1.65	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.15		
Dorset----------	0-9	4-18	1.40-1.55	2.00-6.00	0.13-0.15	Low------	3.0-5.0	0.20	0.20	4	3
	9-17	10-18	1.45-1.65	2.00-6.00	0.12-0.19	Low------	1.0-2.0	0.28	0.28		
	17-25	5-10	1.55-1.65	6.00-20.00	0.06-0.10	Low------	0.0-0.5	0.10	0.17		
	25-60	0-5	1.55-1.65	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.15		
1248C:											
Nymore----------	0-7	2-12	1.45-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.17	0.17	5	2
	7-55	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		
	55-60	0-5	1.55-1.65	6.00-20.00	0.02-0.08	Low------	0.0-0.5	0.17	0.17		
Verndale--------	0-6	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	6-27	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	27-48	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	48-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
1249C:											
Graycalm--------	0-8	0-10	1.30-1.55	6.00-20.00	0.06-0.12	Low------	0.5-2.0	0.15	0.17	5	2
	8-18	0-15	1.25-1.60	6.00-20.00	0.05-0.10	Low------	0.0-0.5	0.10	0.15		
	18-37	0-10	1.50-1.65	6.00-20.00	0.04-0.09	Low------	0.0-0.5	0.10	0.15		
	37-60	0-10	1.50-1.65	6.00-20.00	0.04-0.06	Low------	0.0-0.5	0.10	0.15		
Bootlake--------	0-8	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	8-17	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	17-27	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	27-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
1250C:											
Abbeylake-------	0-9	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	1.0-3.0	0.15	0.15	5	2
	9-16	0-10	1.50-1.65	6.00-20.00	0.03-0.11	Low------	0.0-0.5	0.10	0.10		
	16-60	0-3	1.50-1.65	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
Verndale--------	0-8	7-12	1.50-1.70	2.00-6.00	0.13-0.17	Low------	2.0-4.0	0.20	0.20	3	3
	8-14	7-18	1.60-1.70	0.60-2.00	0.14-0.18	Low------	0.5-1.0	0.24	0.24		
	14-28	2-6	1.45-1.60	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.10	0.10		
	28-60	0-4	1.45-1.60	6.00-20.00	0.02-0.06	Low------	0.0-0.5	0.10	0.10		
1251:											
Lamoure---------	0-41	20-26	1.10-1.25	0.20-2.00	0.19-0.22	Low------	4.0-8.0	0.28	0.28	5	4L
	41-53	20-34	1.20-1.35	0.20-2.00	0.17-0.20	Moderate	1.0-3.0	0.32	0.32		
	53-60	20-34	1.25-1.40	0.20-2.00	0.09-0.18	Moderate	0.0-0.5	0.28	0.28		
1252B:											
Bootlake--------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-14	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	14-41	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	41-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
Eagleview-------	0-2	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	2-12	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	12-42	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	42-60	2-10	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	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1263C:											
Eagleview-------	0-3	2-10	1.40-1.60	6.00-20.00	0.10-0.12	Low------	0.5-2.0	0.17	0.17	5	2
	3-17	2-10	1.50-1.65	6.00-20.00	0.09-0.11	Low------	0.5-1.0	0.17	0.17		
	17-32	2-10	1.50-1.65	6.00-20.00	0.06-0.08	Low------	0.0-0.5	0.15	0.15		
	32-60	2-10	1.50-1.65	6.00-20.00	0.05-0.07	Low------	0.0-0.5	0.15	0.15		
Bootlake--------	0-3	5-15	1.30-1.50	2.00-6.00	0.13-0.15	Low------	1.0-2.0	0.20	0.20	4	3
	3-15	2-10	1.40-1.60	6.00-20.00	0.09-0.11	Low------	0.0-0.5	0.17	0.17		
	15-24	10-18	1.40-1.60	2.00-6.00	0.12-0.15	Low------	0.0-0.5	0.24	0.24		
	24-60	1-5	1.50-1.65	6.00-20.00	0.02-0.07	Low------	0.0-0.5	0.15	0.15		
1291:											
Sedgeville------	0-8	0-23	1.35-1.45	0.60-2.00	0.17-0.24	Low------	4.0-12	0.28	0.28	4	8
	8-34	8-17	1.40-1.50	0.60-2.00	0.10-0.22	Low------	1.0-12	0.32	0.43		
	34-60	2-5	1.55-1.70	6.00-20.00	0.04-0.16	Low------	1.0-12	0.10	0.15		
1306:											
Karlstad--------	0-15	5-15	1.20-1.45	2.00-6.00	0.13-0.18	Low------	1.0-4.0	0.24	0.24	3	3
	15-27	5-18	1.35-1.60	2.00-6.00	0.13-0.18	Low------	0.5-2.0	0.24	0.24		
	27-60	1-5	1.50-1.70	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.10	0.17		
1317:											
Vallers---------	0-15	28-35	1.20-1.35	0.20-0.60	0.18-0.22	Moderate	5.0-8.0	0.28	0.28	5	4L
	15-23	18-35	1.40-1.55	0.20-0.60	0.15-0.19	Moderate	1.0-3.0	0.28	0.28		
	23-60	18-35	1.50-1.70	0.20-0.60	0.17-0.19	Low------	0.0-0.5	0.37	0.37		
1318:											
Darnen----------	0-56	18-27	1.25-1.40	0.60-2.00	0.18-0.20	Low------	4.0-8.0	0.24	0.24	5	6
	56-60	18-30	1.40-1.60	0.60-2.00	0.15-0.19	Moderate	1.0-2.0	0.28	0.28		
1319B:											
Rockwood--------	0-4	5-15	1.55-1.75	0.60-2.00	0.13-0.18	Low------	2.0-4.0	0.24	0.24	4	3
	4-14	5-10	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	14-19	8-18	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	19-30	8-18	1.65-1.80	0.20-0.60	0.12-0.15	Low------	---	0.28	0.28		
	30-60	7-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		
1319C:											
Rockwood--------	0-7	5-15	1.55-1.75	0.60-2.00	0.13-0.18	Low------	2.0-4.0	0.24	0.24	4	3
	7-16	5-10	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	16-23	8-18	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	23-31	8-18	1.65-1.80	0.20-0.60	0.12-0.15	Low------	---	0.28	0.28		
	31-60	7-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		
1319D:											
Rockwood--------	0-2	5-15	1.55-1.75	0.60-2.00	0.13-0.18	Low------	2.0-4.0	0.24	0.24	4	3
	2-15	5-10	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	15-21	8-18	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	21-32	8-18	1.65-1.80	0.20-0.60	0.12-0.15	Low------	---	0.28	0.28		
	32-60	7-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		
1320B:											
Blowers---------	0-3	5-15	1.55-1.80	0.60-2.00	0.13-0.18	Low------	2.0-6.0	0.24	0.24	4	3
	3-14	5-10	1.60-1.80	0.60-2.00	0.12-0.15	Low------	---	0.28	0.28		
	14-22	8-18	1.60-1.75	0.60-2.00	0.12-0.15	Low------	---	0.24	0.24		
	22-32	8-18	1.65-1.80	0.20-0.60	0.12-0.15	Low------	---	0.24	0.24		
	32-60	7-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		
1321:											
Paddock---------	0-4	8-15	1.45-1.75	0.60-2.00	0.13-0.18	Low------	2.0-6.0	0.24	0.24	4	3
	4-16	3-10	1.50-1.75	0.60-2.00	0.12-0.16	Low------	---	0.24	0.24		
	16-43	8-18	1.60-1.80	0.20-0.60	0.12-0.16	Low------	---	0.24	0.24		
	43-60	6-15	1.80-2.00	0.00-0.06	0.00-0.04	Low------	---	0.24	0.24		

PHYSICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Shrink-swell potential	Organic matter	Erosion factors			Wind erodibility group
								K	Kf	T	
	In	Pct	g/cc	In/hr	In/in		Pct				
1365:											
Hillview--------	0-8	5-15	1.25-1.40	2.00-6.00	0.13-0.18	Low------	2.0-4.0	0.20	0.20	5	3
	8-19	3-12	1.35-1.55	2.00-6.00	0.10-0.14	Low------	0.5-1.0	0.17	0.17		
	19-28	8-18	1.35-1.55	2.00-6.00	0.12-0.19	Low------	0.5-1.0	0.24	0.24		
	28-60	3-12	1.35-1.65	2.00-6.00	0.08-0.17	Low------	0.0-0.5	0.28	0.28		
1825B:											
Seelyeville-----	0-60	---	0.10-0.25	0.20-6.00	0.35-0.45	---	25-99	0.10	0.10	3	8
1878:											
Hamre-----------	0-14	---	0.18-0.22	0.20-2.00	0.35-0.48	Low------	85-95	---	---	5	2
	14-19	18-35	1.30-1.70	0.20-2.00	0.17-0.19	Moderate	4.0-10	0.32	0.32		
	19-60	18-35	1.40-1.70	0.20-2.00	0.17-0.19	Moderate	0.5-2.0	0.32	0.32		
1938:											
Lakepark--------	0-8	27-35	1.30-1.45	0.20-0.60	0.19-0.21	Low------	5.0-8.0	0.24	0.24	5	6
	8-28	20-35	1.30-1.45	0.20-0.60	0.19-0.21	Low------	1.0-3.0	0.24	0.24		
	28-34	22-35	1.40-1.50	0.20-0.60	0.15-0.19	Moderate	0.5-1.0	0.32	0.32		
	34-60	22-35	1.50-1.65	0.20-0.60	0.14-0.19	Moderate	0.0-0.5	0.32	0.32		
1942:											
Forada----------	0-10	10-22	1.00-1.40	0.60-2.00	0.20-0.22	Low------	5.0-15	0.28	0.28	4	5
	10-21	8-18	1.30-1.50	2.00-6.00	0.12-0.19	Low------	0.5-1.0	0.28	0.28		
	21-60	0-5	1.50-1.70	6.00-20.00	0.02-0.04	Low------	0.0-0.5	0.15	0.15		
1967:											
Hamerly---------	0-9	27-35	1.20-1.50	0.60-2.00	0.17-0.22	Moderate	4.0-7.0	0.28	0.28	5	4L
	9-20	18-35	1.20-1.60	0.60-2.00	0.15-0.19	Moderate	---	0.28	0.32		
	20-60	18-35	1.30-1.60	0.20-0.60	0.14-0.19	Moderate	---	0.37	0.37		
Vallers---------	0-15	28-35	1.20-1.35	0.20-0.60	0.18-0.22	Moderate	5.0-8.0	0.28	0.28	5	4L
	15-25	18-35	1.40-1.55	0.20-0.60	0.15-0.19	Moderate	1.0-3.0	0.28	0.28		
	25-60	18-35	1.50-1.70	0.20-0.60	0.17-0.19	Low------	0.0-0.5	0.37	0.37		
1975:											
Oylen-----------	0-13	7-12	1.50-1.70	2.00-6.00	0.12-0.16	Low------	2.0-4.0	0.20	0.20	3	3
	13-22	7-18	1.60-1.70	0.60-2.00	0.12-0.18	Low------	0.5-2.0	0.24	0.24		
	22-52	2-6	1.45-1.60	6.00-20.00	0.03-0.08	Low------	0.0-0.5	0.10	0.10		
	52-60	0-4	1.45-1.60	6.00-20.00	0.03-0.07	Low------	0.0-0.5	0.10	0.10		
1997:											
Vallers---------	0-15	28-35	1.20-1.35	0.20-0.60	0.18-0.22	Moderate	5.0-8.0	0.28	0.28	5	4L
	15-27	18-35	1.40-1.55	0.20-0.60	0.15-0.19	Moderate	1.0-3.0	0.28	0.28		
	27-60	18-35	1.50-1.70	0.20-0.60	0.17-0.19	Low------	0.0-0.5	0.37	0.37		
Hamerly---------	0-9	27-35	1.20-1.50	0.60-2.00	0.17-0.22	Moderate	4.0-7.0	0.28	0.28	5	4L
	9-21	18-35	1.20-1.60	0.60-2.00	0.15-0.19	Moderate	---	0.28	0.32		
	21-60	18-35	1.30-1.60	0.20-0.60	0.14-0.19	Moderate	---	0.37	0.37		
Winger----------	0-22	27-35	1.20-1.40	0.60-2.00	0.22-0.24	Low------	4.0-6.0	0.28	0.28	5	4L
	22-35	18-35	1.30-1.50	0.60-2.00	0.22-0.24	Low------	0.0-0.5	0.28	0.28		
	35-60	18-32	1.50-1.70	0.20-2.00	0.14-0.19	Low------	---	0.28	0.28		

CHEMICAL PROPERTIES OF THE SOILS

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
20B:						
Chapett	0-8	10-20	8.0-20.0	6.1-7.3	---	---
	8-23	18-28	8.0-19.0	6.1-7.3	---	---
	23-33	10-18	4.0-12.0	7.4-8.4	15-30	---
	33-60	10-18	4.0-12.0	7.4-8.4	10-12	---
20C2:						
Chapett	0-9	10-20	8.0-20.0	6.1-7.3	---	---
	9-26	18-28	8.0-19.0	6.1-7.3	---	---
	26-43	10-18	4.0-12.0	7.4-8.4	15-30	---
	43-60	10-18	4.0-12.0	7.4-8.4	10-12	---
20E:						
Chapett	0-7	10-20	8.0-20.0	6.1-7.3	---	---
	7-20	18-28	8.0-19.0	6.1-7.3	---	---
	20-33	10-18	4.0-12.0	7.4-8.4	15-30	---
	33-60	10-18	4.0-12.0	7.4-8.4	10-12	---
26:						
Aazdahl	0-13	27-35	20.0-30.0	6.6-7.3	---	---
	13-19	27-35	14.0-24.0	6.6-7.8	15-30	---
	19-60	24-35	12.0-18.0	7.4-8.4	15-30	---
33B:						
Barnes	0-7	18-27	11.0-26.0	6.1-7.8	---	0-2
	7-13	18-27	8.0-18.0	6.1-7.8	0-5	0-2
	13-60	18-27	7.0-17.0	7.4-8.4	10-30	0-4
36:						
Flom	0-16	27-35	20.0-37.0	6.1-7.8	0-15	---
	16-24	24-35	10.0-23.0	6.6-8.4	0-25	---
	24-60	24-35	10.0-21.0	7.4-8.4	5-25	---
38B:						
Waukon	0-9	12-27	9.0-28.0	6.1-7.3	---	---
	9-20	18-35	7.0-21.0	6.1-8.4	0-30	---
	20-60	18-30	7.0-18.0	7.4-8.4	5-30	---
38C:						
Waukon	0-8	12-27	9.0-28.0	6.1-7.3	---	---
	8-20	18-35	7.0-21.0	6.1-8.4	0-30	---
	20-60	18-30	7.0-18.0	7.4-8.4	5-30	---
38E:						
Waukon	0-7	12-27	9.0-28.0	6.1-7.3	---	---
	7-26	18-35	7.0-21.0	6.1-8.4	0-30	---
	26-60	18-30	7.0-18.0	7.4-8.4	5-30	---
40B:						
Nebish	0-7	5-20	4.0-14.0	5.6-7.3	---	---
	7-26	22-35	10.0-18.0	5.6-7.8	---	---
	26-60	18-30	9.0-16.0	7.4-8.4	5-15	---
40C:						
Nebish	0-8	5-20	4.0-14.0	5.6-7.3	---	---
	8-26	22-35	10.0-18.0	5.6-7.8	---	---
	26-60	18-30	9.0-16.0	7.4-8.4	5-15	---
40E:						
Nebish	0-9	5-20	4.0-14.0	5.6-7.3	---	---
	9-22	22-35	10.0-18.0	5.6-7.8	---	---
	22-60	18-30	9.0-16.0	7.4-8.4	5-15	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
47:						
Colvin----------	0-10	27-34	25.0-40.0	6.6-8.4	0-10	---
	10-26	18-34	15.0-25.0	7.4-9.0	10-45	---
	26-60	18-34	10.0-20.0	7.4-8.4	5-20	---
63:						
Rockwell--------	0-18	20-30	15.0-30.0	7.4-8.4	10-20	---
	18-25	5-30	5.0-15.0	7.9-8.4	15-30	---
	25-32	3-10	2.0-6.0	7.4-7.8	10-20	---
	32-60	15-30	5.0-15.0	7.4-7.8	10-20	---
108:						
McIntosh--------	0-9	18-27	19.0-36.0	7.4-8.4	5-30	---
	9-30	18-35	15.0-38.0	7.4-8.4	20-35	---
	30-60	18-35	9.0-27.0	7.4-8.4	5-30	---
111:						
Hangaard--------	0-10	8-18	10.0-26.0	6.6-7.8	---	---
	10-18	5-15	4.0-14.0	6.6-7.8	0-5	---
	18-60	2-10	2.0-6.0	7.4-8.4	5-15	---
121:						
Wykeham---------	0-8	5-18	6.0-23.0	5.1-6.5	---	---
	8-11	5-15	4.0-13.0	5.1-6.5	---	---
	11-21	18-30	8.0-20.0	5.6-7.3	---	---
	21-60	10-18	4.0-12.0	7.4-8.4	10-25	---
125:						
Beltrami--------	0-4	6-18	8.0-22.0	6.1-7.3	---	---
	4-8	5-15	4.0-14.0	5.6-7.3	---	---
	8-22	18-35	9.0-19.0	5.6-7.8	---	---
	22-60	18-30	8.0-16.0	7.4-8.4	12-30	---
133A:						
Dalbo-----------	0-6	20-27	8.0-25.0	5.6-7.3	---	---
	6-41	35-60	14.0-40.0	5.1-7.3	---	---
	41-60	24-35	10.0-22.0	7.4-8.4	5-30	---
133B:						
Dalbo-----------	0-7	20-27	8.0-25.0	5.6-7.3	---	---
	7-21	35-60	14.0-40.0	5.1-7.3	---	---
	21-60	24-35	10.0-22.0	7.4-8.4	5-30	---
133C:						
Dalbo-----------	0-7	20-27	8.0-25.0	5.6-7.3	---	---
	7-25	35-60	14.0-40.0	5.1-7.3	---	---
	25-60	24-35	10.0-22.0	7.4-8.4	5-30	---
133E:						
Dalbo-----------	0-7	20-27	8.0-25.0	5.6-7.3	---	---
	7-29	35-60	14.0-40.0	5.1-7.3	---	---
	29-60	24-35	10.0-22.0	7.4-8.4	5-30	---
137:						
Dovray----------	0-10	40-60	30.0-50.0	6.1-7.8	---	---
	10-43	40-60	20.0-30.0	6.1-7.8	0-3	---
	43-54	40-60	20.0-30.0	6.6-7.8	0-5	---
	54-60	25-60	20.0-30.0	6.6-8.4	0-15	---
141B:						
Egeland---------	0-9	10-18	15.0-20.0	5.6-7.3	---	0-2
	9-16	10-18	15.0-20.0	6.1-7.8	---	0-2
	16-60	6-14	15.0-20.0	7.4-8.4	10-20	0-2

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
141C:						
Egeland---------	0-13	10-18	15.0-20.0	5.6-7.3	---	0-2
	13-22	10-18	15.0-20.0	6.1-7.8	---	0-2
	22-60	6-14	15.0-20.0	7.4-8.4	10-20	0-2
168B:						
Forman----------	0-8	27-30	19.0-34.0	6.6-7.8	---	0-2
	8-15	30-35	13.0-23.0	6.6-7.8	---	0-2
	15-60	18-35	7.0-22.0	7.4-8.4	15-30	0-4
168C2:						
Forman----------	0-7	27-30	19.0-34.0	6.6-7.8	---	0-2
	7-16	30-35	13.0-23.0	6.6-7.8	---	0-2
	16-60	18-35	7.0-22.0	7.4-8.4	15-30	0-4
168D2:						
Forman----------	0-8	27-30	19.0-34.0	6.6-7.8	---	0-2
	8-15	30-35	13.0-23.0	6.6-7.8	---	0-2
	15-60	18-35	7.0-22.0	7.4-8.4	15-30	0-4
168E:						
Forman----------	0-7	27-30	19.0-34.0	6.6-7.8	---	0-2
	7-15	30-35	13.0-23.0	6.6-7.8	---	0-2
	15-60	18-35	7.0-22.0	7.4-8.4	15-30	0-4
171B:						
Formdale--------	0-8	27-35	17.0-28.0	6.1-7.3	---	---
	8-14	24-35	13.0-22.0	6.6-7.8	20-30	---
	14-60	18-35	9.0-18.0	7.4-8.4	12-20	---
180:						
Gonvick---------	0-12	10-27	8.0-24.0	6.1-7.3	---	---
	12-34	22-35	12.0-24.0	6.6-7.3	0-5	---
	34-60	18-35	8.0-18.0	7.4-8.4	10-25	---
184:						
Hamerly---------	0-10	18-27	15.0-30.0	6.6-8.4	0-15	---
	10-24	18-30	8.0-20.0	7.4-8.4	15-30	---
	24-60	18-30	7.0-19.0	7.4-8.4	10-25	---
191:						
Epoufette-------	0-6	5-15	10.0-20.0	6.1-7.3	---	---
	6-12	5-15	4.0-14.0	6.1-7.3	0-5	---
	12-20	8-18	4.0-10.0	6.6-7.8	0-10	---
	20-60	0-8	1.0-5.0	7.4-8.4	5-10	---
202:						
Meehan----------	0-13	4-10	2.0-15.0	3.5-7.3	---	---
	13-25	4-9	1.0-8.0	3.5-6.5	---	---
	25-60	1-4	0.0-4.0	5.1-7.3	---	---
207D:						
Nymore----------	0-6	2-12	3.0-13.0	5.1-6.5	---	---
	6-46	0-5	0.0-5.0	5.1-7.3	---	---
	46-60	0-5	0.0-1.0	5.1-7.8	---	---
267B:						
Snellman--------	0-2	5-18	4.0-16.0	5.1-6.5	---	---
	2-16	5-15	3.0-14.0	5.1-6.5	---	---
	16-31	18-30	8.0-16.0	5.6-7.3	---	---
	31-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
267C:						
Snellman--------	0-3	5-18	4.0-16.0	5.1-6.5	---	---
	3-16	5-15	3.0-14.0	5.1-6.5	---	---
	16-28	18-30	8.0-16.0	5.6-7.3	---	---
	28-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
267E:						
Snellman--------	0-2	5-18	4.0-16.0	5.1-6.5	---	---
	2-14	5-15	3.0-14.0	5.1-6.5	---	---
	14-28	18-30	8.0-16.0	5.6-7.3	---	---
	28-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
315A:						
Bootlake--------	0-6	5-15	4.0-15.0	5.6-7.3	---	---
	6-13	2-10	1.0-10.0	5.6-7.3	---	---
	13-28	10-18	5.0-12.0	5.6-7.3	---	---
	28-60	1-5	1.0-5.0	7.4-8.4	5-20	---
315B:						
Bootlake--------	0-3	5-15	4.0-15.0	5.6-7.3	---	---
	3-9	2-10	1.0-10.0	5.6-7.3	---	---
	9-21	10-18	5.0-12.0	5.6-7.3	---	---
	21-60	1-5	1.0-5.0	7.4-8.4	5-20	---
332B:						
Sugarbush-------	0-4	5-15	4.0-12.0	5.6-7.3	---	---
	4-13	2-10	2.0-8.0	5.6-7.3	---	---
	13-18	10-18	5.0-10.0	5.6-7.3	---	---
	18-60	1-5	1.0-5.0	7.4-8.4	5-15	---
335:						
Urness----------	0-7	18-27	40.0-50.0	7.4-8.4	5-25	---
	7-60	18-35	40.0-50.0	7.4-8.4	5-25	---
339:						
Fordville-------	0-10	18-25	21.0-27.0	6.1-7.3	0-1	0-2
	10-17	18-30	21.0-27.0	6.1-7.8	2-15	0-2
	17-28	15-30	15.0-25.0	6.1-8.4	2-20	0-2
	28-60	0-5	1.0-10.0	7.4-8.4	2-20	0-2
344:						
Quam------------	0-10	28-35	25.0-45.0	6.6-7.8	---	---
	10-42	22-35	20.0-40.0	6.6-7.8	0-15	---
	42-60	20-35	12.0-25.0	7.4-8.4	5-20	---
351:						
Colvin----------	0-12	27-34	25.0-40.0	6.6-8.4	0-10	---
	12-45	18-34	15.0-25.0	7.4-8.4	10-45	---
	45-60	18-34	10.0-20.0	7.4-8.4	5-20	---
375:						
Forada----------	0-14	10-22	14.0-30.0	6.1-7.8	0-15	---
	14-22	8-18	4.0-12.0	6.1-7.8	0-15	---
	22-60	0-5	0.0-5.0	6.6-8.4	0-10	---
398:						
Winger----------	0-13	27-35	27.0-38.0	7.4-8.4	5-20	---
	13-37	18-35	9.0-18.0	7.4-8.4	15-35	---
	37-60	18-32	9.0-16.0	7.4-8.4	15-30	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
406A:						
Dorset	0-9	4-18	10.0-23.0	5.6-7.3	---	---
	9-21	10-18	7.0-17.0	5.6-7.3	---	---
	21-60	0-5	0.0-5.0	7.4-8.4	5-15	---
406B:						
Dorset	0-10	4-18	10.0-23.0	5.6-7.3	---	---
	10-17	10-18	7.0-17.0	5.6-7.3	---	---
	17-29	5-10	3.0-8.0	7.4-8.4	10-25	---
	29-60	0-5	0.0-5.0	7.4-8.4	5-15	---
413:						
Osakis	0-8	8-18	12.0-19.0	6.1-7.3	---	---
	8-18	8-18	9.0-13.0	6.1-7.3	---	---
	18-60	0-5	0.0-4.0	7.4-8.4	5-30	---
418:						
Lamoure	0-39	27-34	25.0-32.0	7.4-8.4	0-10	0-4
	39-60	20-34	16.0-23.0	7.4-8.4	4-20	0-4
422B:						
Bygland	0-8	27-40	20.0-40.0	6.1-7.3	---	---
	8-22	35-60	15.0-30.0	6.1-7.8	0-5	---
	22-38	18-40	10.0-25.0	7.4-8.4	10-20	---
	38-60	18-40	10.0-20.0	7.4-8.4	5-15	---
422C:						
Bygland	0-8	27-40	20.0-40.0	6.1-7.3	---	---
	8-16	35-60	15.0-30.0	6.1-7.8	0-5	---
	16-25	18-40	10.0-25.0	7.4-8.4	10-20	---
	25-60	18-40	10.0-20.0	7.4-8.4	5-15	---
503B:						
Balmlake	0-3	3-12	5.0-10.0	5.1-6.5	---	---
	3-20	3-12	3.0-7.0	5.1-6.5	---	---
	20-28	8-18	5.0-10.0	5.6-6.5	---	---
	28-60	6-14	4.0-8.0	7.4-8.4	---	---
503C:						
Balmlake	0-2	3-12	5.0-10.0	5.1-6.5	---	---
	2-17	3-12	3.0-7.0	5.1-6.5	---	---
	17-29	8-18	5.0-10.0	5.6-6.5	---	---
	29-60	6-14	4.0-8.0	7.4-8.4	---	---
503E:						
Balmlake	0-2	3-12	5.0-10.0	5.1-6.5	---	---
	2-15	3-12	3.0-7.0	5.1-6.5	---	---
	15-28	8-18	5.0-10.0	5.6-6.5	---	---
	28-60	6-14	4.0-8.0	7.4-8.4	---	---
508:						
Wyndmere	0-14	5-15	20.0-40.0	7.4-8.4	10-25	---
	14-24	0-10	10.0-20.0	7.4-8.4	15-40	0-2
	24-60	0-10	5.0-15.0	7.4-8.4	5-25	0-2
540:						
Seelyeville	0-24	---	140-200	4.5-7.3	---	---
	24-60	---	140-200	4.5-7.3	---	---
541:						
Rifle	0-14	---	150-180	4.5-7.3	---	---
	14-60	---	50-150	4.5-7.3	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
544:						
Cathro----------	0-8	---	120-170	4.5-7.8	---	---
	8-22	---	120-170	4.5-7.8	---	---
	22-60	10-30	2.0-25.0	6.6-8.4	5-25	---
564:						
Friendship------	0-3	3-8	2.0-10.0	4.5-7.3	---	---
	3-31	0-4	0.0-4.0	4.5-7.3	---	---
	31-60	0-4	0.0-4.0	5.1-7.8	---	---
567A:						
Verndale--------	0-8	7-12	7.0-15.0	5.6-7.3	---	---
	8-15	7-18	3.0-12.0	5.6-7.3	---	---
	15-33	2-6	2.0-4.0	5.6-7.3	---	---
	33-60	0-4	0.0-3.0	6.1-8.4	0-30	---
567B:						
Verndale--------	0-7	7-12	7.0-15.0	5.6-7.3	---	---
	7-13	7-18	3.0-12.0	5.6-7.3	---	---
	13-31	2-6	2.0-4.0	5.6-7.3	---	---
	31-60	0-4	0.0-3.0	6.1-8.4	0-30	---
579C2:						
Formdale--------	0-7	27-35	17.0-28.0	6.1-7.3	---	---
	7-11	24-35	13.0-22.0	6.6-7.8	20-30	---
	11-60	18-35	9.0-18.0	7.4-8.4	12-20	---
Langhei---------	0-7	28-35	10.0-30.0	6.6-8.4	0-30	---
	7-13	28-35	10.0-25.0	7.4-8.4	20-35	---
	13-60	28-35	10.0-25.0	7.4-8.4	15-30	---
Sandberg--------	0-8	5-15	4.0-16.0	5.6-7.8	0-5	---
	8-18	0-5	1.0-6.0	7.4-8.4	10-25	---
	18-60	0-5	1.0-4.0	7.4-8.4	5-10	---
624:						
Rosy------------	0-20	3-12	1.0-15.0	5.1-7.3	---	---
	20-26	8-18	4.0-10.0	5.1-7.3	---	---
	26-60	6-18	3.0-10.0	5.6-8.4	0-30	---
701:						
Runeberg--------	0-10	10-25	12.0-40.0	6.1-7.3	---	---
	10-36	10-18	4.0-14.0	6.1-7.3	---	---
	36-60	6-15	2.0-9.0	7.4-8.4	---	---
711B:						
Arvilla---------	0-8	6-18	5.0-20.0	6.1-8.4	---	---
	8-15	6-18	5.0-15.0	6.6-8.4	---	---
	15-60	2-10	1.0-5.0	7.4-8.4	1-5	---
Sandberg--------	0-8	5-15	4.0-16.0	5.6-7.8	0-5	---
	8-15	0-10	1.0-6.0	6.1-7.8	0-5	---
	15-36	0-5	1.0-6.0	7.4-8.4	10-25	---
	36-60	0-5	1.0-4.0	7.4-8.4	5-10	---
711C:						
Arvilla---------	0-8	6-18	5.0-20.0	6.1-8.4	---	---
	8-15	6-18	5.0-15.0	6.6-8.4	---	---
	15-60	2-10	1.0-5.0	7.4-8.4	1-5	---
Sandberg--------	0-8	5-15	4.0-16.0	5.6-7.8	0-5	---
	8-15	0-5	1.0-6.0	7.4-8.4	10-25	---
	15-60	0-5	1.0-4.0	7.4-8.4	5-10	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
718B:						
Naytahwaush-----	0-4	10-20	15.0-28.0	5.6-7.3	---	---
	4-7	8-15	6.0-18.0	5.6-7.3	---	---
	7-30	35-60	15.0-26.0	5.6-7.3	0-5	---
	30-60	22-35	9.0-22.0	7.4-8.4	15-25	---
718C:						
Naytahwaush-----	0-4	10-20	15.0-28.0	5.6-7.3	---	---
	4-6	8-15	6.0-18.0	5.6-7.3	---	---
	6-23	35-60	15.0-26.0	5.6-7.3	0-5	---
	23-60	22-35	9.0-22.0	7.4-8.4	15-25	---
718E:						
Naytahwaush-----	0-3	10-20	15.0-28.0	5.6-7.3	---	---
	3-7	8-15	6.0-18.0	5.6-7.3	---	---
	7-23	35-60	15.0-26.0	5.6-7.3	0-5	---
	23-60	22-35	9.0-22.0	7.4-8.4	15-25	---
721E:						
Corliss---------	0-7	2-10	3.0-12.0	6.1-7.8	0-15	---
	7-60	0-5	0.0-3.0	7.4-8.4	5-30	---
746:						
Haslie----------	0-8	---	140-180	5.6-7.8	---	---
	8-43	---	140-190	5.6-7.8	---	---
	43-60	18-35	10.0-45.0	7.4-8.4	20-80	---
747B:						
Audubon---------	0-9	40-60	25.0-45.0	6.6-7.8	---	---
	9-29	35-60	19.0-37.0	7.4-8.4	15-30	---
	29-60	35-60	18.0-35.0	7.4-8.4	10-25	---
753D:						
Abbeylake-------	0-8	2-10	3.0-15.0	6.1-7.3	0-15	---
	8-24	0-10	1.0-8.0	6.1-7.3	0-15	---
	24-60	0-3	1.0-5.0	7.4-8.4	5-30	---
753E:						
Abbeylake-------	0-3	2-10	3.0-15.0	6.1-7.3	0-15	---
	3-21	0-10	1.0-8.0	6.1-7.3	0-15	---
	21-60	0-3	1.0-5.0	7.4-8.4	5-30	---
765:						
Smiley----------	0-13	8-20	7.0-22.0	6.6-7.8	0-15	---
	13-26	18-35	8.0-25.0	6.6-8.4	0-30	---
	26-47	16-32	8.0-25.0	7.9-8.4	10-30	---
	47-60	16-32	5.0-20.0	7.4-8.4	5-25	---
767:						
Auganaush-------	0-5	12-27	15.0-30.0	5.6-7.3	---	---
	5-8	5-18	5.0-15.0	5.6-7.3	---	---
	8-22	35-60	15.0-30.0	5.6-7.3	---	---
	22-60	30-45	15.0-25.0	7.4-8.4	15-30	---
775B:						
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-13	2-10	2.0-8.0	5.6-7.3	---	---
	13-25	10-18	5.0-10.0	5.6-7.3	---	---
	25-60	1-5	1.0-5.0	7.4-8.4	5-15	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
775B:						
Two Inlets------	0-4	2-10	2.0-8.0	5.6-7.3	---	---
	4-13	2-10	1.0-6.0	5.6-7.3	---	---
	13-27	5-15	2.0-9.0	6.1-7.3	---	---
	27-60	0-3	0.0-2.0	7.4-8.4	5-30	---
775C:						
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-10	2-10	2.0-8.0	5.6-7.3	---	---
	10-22	10-18	5.0-10.0	5.6-7.3	---	---
	22-60	1-5	1.0-5.0	7.4-8.4	5-15	---
Two Inlets------	0-2	2-10	2.0-8.0	5.6-7.3	---	---
	2-10	2-10	1.0-6.0	5.6-7.3	---	---
	10-27	5-15	2.0-9.0	6.1-7.3	---	---
	27-60	0-3	0.0-2.0	7.4-8.4	5-30	---
776B:						
Snellman--------	0-3	5-18	4.0-16.0	5.1-6.5	---	---
	3-12	5-15	3.0-14.0	5.1-6.5	---	---
	12-32	18-30	8.0-16.0	5.6-7.3	---	---
	32-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-17	2-10	2.0-8.0	5.6-7.3	---	---
	17-28	10-18	5.0-10.0	5.6-7.3	---	---
	28-60	1-5	1.0-5.0	7.4-8.4	5-15	---
776C:						
Snellman--------	0-2	5-18	4.0-16.0	5.1-6.5	---	---
	2-16	5-15	3.0-14.0	5.1-6.5	---	---
	16-32	18-30	8.0-16.0	5.6-7.3	---	---
	32-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-14	2-10	2.0-8.0	5.6-7.3	---	---
	14-21	10-18	5.0-10.0	5.6-7.3	---	---
	21-60	1-5	1.0-5.0	7.4-8.4	5-15	---
776E:						
Snellman--------	0-3	5-18	4.0-16.0	5.1-6.5	---	---
	3-14	5-15	3.0-14.0	5.1-6.5	---	---
	14-26	18-30	8.0-16.0	5.6-7.3	---	---
	26-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-10	2-10	2.0-8.0	5.6-7.3	---	---
	10-19	10-18	5.0-10.0	5.6-7.3	---	---
	19-60	1-5	1.0-5.0	7.4-8.4	5-15	---
778B:						
Dorset----------	0-10	4-18	10.0-23.0	5.6-7.3	---	---
	10-20	10-18	7.0-17.0	5.6-7.3	---	---
	20-24	5-10	3.0-8.0	7.4-8.4	10-25	---
	24-60	0-5	0.0-5.0	7.4-8.4	5-15	---
Corliss---------	0-5	2-10	3.0-12.0	6.1-7.8	0-15	---
	5-13	0-10	1.0-6.0	6.1-7.8	0-15	---
	13-60	0-5	0.0-3.0	7.4-8.4	5-30	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
778C:						
Dorset----------	0-9	4-18	10.0-23.0	5.6-7.3	---	---
	9-15	10-18	7.0-17.0	5.6-7.3	---	---
	15-18	5-10	3.0-8.0	7.4-8.4	10-25	---
	18-60	0-5	0.0-5.0	7.4-8.4	5-15	---
Corliss---------	0-5	2-10	3.0-12.0	6.1-7.8	0-15	---
	5-60	0-5	0.0-3.0	7.4-8.4	5-30	---
780B:						
Audubon---------	0-9	40-60	25.0-45.0	6.6-7.8	---	---
	9-27	35-60	19.0-37.0	7.4-8.4	15-30	---
	27-60	35-60	18.0-35.0	7.4-8.4	10-25	---
Boyerlake-------	0-9	35-40	16.0-36.0	7.4-8.4	5-20	---
	9-17	35-60	15.0-32.0	7.4-8.4	15-25	---
	17-60	35-60	14.0-31.0	7.4-8.4	10-20	---
780C2:						
Audubon---------	0-10	40-60	25.0-45.0	6.6-7.8	---	---
	10-20	35-60	19.0-37.0	7.4-8.4	15-30	---
	20-60	35-60	18.0-35.0	7.4-8.4	10-25	---
Boyerlake-------	0-9	35-40	16.0-36.0	7.4-8.4	5-20	---
	9-19	35-60	15.0-32.0	7.4-8.4	15-25	---
	19-60	35-60	14.0-31.0	7.4-8.4	10-20	---
780D2:						
Audubon---------	0-10	40-60	25.0-45.0	6.6-7.8	---	---
	10-22	35-60	19.0-37.0	7.4-8.4	15-30	---
	22-60	35-60	18.0-35.0	7.4-8.4	10-25	---
Boyerlake-------	0-7	35-40	16.0-36.0	7.4-8.4	5-20	---
	7-37	35-60	15.0-32.0	7.4-8.4	15-25	---
	37-60	35-60	14.0-31.0	7.4-8.4	10-20	---
785:						
Hamerly---------	0-8	27-35	---	6.6-8.4	---	---
	8-33	18-35	---	7.4-8.4	---	---
	33-60	18-35	---	7.4-8.4	---	---
Winger----------	0-15	27-35	---	7.4-8.4	---	---
	15-22	18-35	---	7.4-8.4	---	---
	22-60	18-32	---	7.4-8.4	---	---
786:						
Winger----------	0-14	27-35	---	7.4-8.4	---	---
	14-33	18-35	---	7.4-8.4	---	---
	33-60	18-32	---	7.4-8.4	---	---
Hamerly---------	0-9	27-35	---	6.6-8.4	---	---
	9-18	18-35	---	7.4-8.4	---	---
	18-60	18-35	---	7.4-8.4	---	---
Colvin----------	0-15	27-34	25.0-40.0	6.6-8.4	0-10	---
	15-38	18-34	15.0-25.0	7.4-8.4	10-45	---
	38-60	18-34	10.0-20.0	7.4-8.4	5-20	---
797:						
Mooselake-------	0-15	---	---	4.5-7.3	---	---
	15-60	---	---	4.5-7.3	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
797:						
Lupton----------	0-15	---	100-200	4.5-7.8	---	---
	15-60	---	100-200	4.5-7.8	---	---
867B:						
Graycalm--------	0-6	0-10	4.0-12.0	4.5-6.5	---	---
	6-21	0-15	2.0-4.0	4.5-7.3	---	---
	21-46	0-10	1.0-5.0	4.5-7.3	---	---
	46-60	0-10	0.0-2.0	5.6-8.4	---	---
Menahga---------	0-3	2-10	2.0-10.0	4.5-6.5	---	---
	3-42	0-5	1.0-4.0	4.5-6.5	---	---
	42-60	0-5	1.0-4.0	5.6-7.8	---	---
867C:						
Graycalm--------	0-6	0-10	4.0-12.0	4.5-6.5	---	---
	6-26	0-15	2.0-4.0	4.5-7.3	---	---
	26-55	0-10	1.0-5.0	4.5-7.3	---	---
	55-60	0-10	0.0-2.0	5.6-8.4	---	---
Menahga---------	0-2	2-10	2.0-10.0	4.5-6.5	---	---
	2-40	0-5	1.0-4.0	4.5-6.5	---	---
	40-60	0-5	1.0-4.0	5.6-7.8	---	---
867E:						
Graycalm--------	0-3	0-10	4.0-12.0	4.5-6.5	---	---
	3-37	0-15	2.0-4.0	4.5-7.3	---	---
	37-60	0-10	1.0-5.0	4.5-7.3	---	---
Menahga---------	0-12	2-10	2.0-10.0	4.5-6.5	---	---
	12-52	0-5	1.0-4.0	4.5-6.5	---	---
	52-60	0-5	1.0-4.0	5.6-7.8	---	---
903B:						
Barnes----------	0-9	18-27	11.0-26.0	6.1-7.8	---	0-2
	9-19	18-27	8.0-18.0	6.1-7.8	0-5	0-2
	19-60	18-27	7.0-17.0	7.4-8.4	10-30	0-4
Langhei---------	0-6	18-27	10.0-30.0	6.6-8.4	0-30	---
	6-17	18-32	10.0-25.0	7.9-8.4	20-35	---
	17-60	18-32	10.0-25.0	7.4-8.4	15-30	---
903C2:						
Barnes----------	0-8	18-27	11.0-26.0	6.1-7.8	---	0-2
	8-19	18-27	8.0-18.0	6.1-7.8	0-5	0-2
	19-60	18-27	7.0-17.0	7.4-8.4	10-30	0-4
Langhei---------	0-7	18-27	10.0-30.0	6.6-8.4	0-30	---
	7-16	18-32	10.0-25.0	7.9-8.4	20-35	---
	16-60	18-32	10.0-25.0	7.4-8.4	15-30	---
931C2:						
Formdale--------	0-7	27-35	17.0-28.0	6.1-7.3	---	---
	7-15	24-35	13.0-22.0	6.6-7.8	20-30	---
	15-60	18-35	9.0-18.0	7.4-8.4	12-20	---
Langhei---------	0-8	28-35	10.0-30.0	6.6-8.4	0-30	---
	8-19	28-35	10.0-25.0	7.4-8.4	20-35	---
	19-60	28-35	10.0-25.0	7.4-8.4	15-30	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
942D2:						
Langhei---------	0-7	18-27	10.0-30.0	6.6-8.4	0-30	---
	7-11	18-32	10.0-25.0	7.9-8.4	20-35	---
	11-60	18-32	10.0-25.0	7.4-8.4	15-30	---
Barnes----------	0-7	18-27	11.0-26.0	6.1-7.8	---	0-2
	7-15	18-27	8.0-18.0	6.1-7.8	0-5	0-2
	15-60	18-27	7.0-17.0	7.4-8.4	10-30	0-4
943D2:						
Langhei---------	0-6	28-35	10.0-30.0	6.6-8.4	0-30	---
	6-13	28-35	10.0-25.0	7.4-8.4	20-35	---
	13-60	28-35	10.0-25.0	7.4-8.4	15-30	---
Formdale--------	0-7	27-35	17.0-28.0	6.1-7.3	---	---
	7-14	24-35	13.0-22.0	6.6-7.8	20-30	---
	14-60	18-35	9.0-18.0	7.4-8.4	12-20	---
943E:						
Langhei---------	0-8	28-35	10.0-30.0	6.6-8.4	0-30	---
	8-60	28-35	10.0-25.0	7.4-8.4	20-35	---
Formdale--------	0-8	27-35	17.0-28.0	6.1-7.3	---	---
	8-16	24-35	13.0-22.0	6.6-7.8	20-30	---
	16-60	18-35	9.0-18.0	7.4-8.4	12-20	---
951B:						
Nebish----------	0-2	5-20	4.0-14.0	5.6-7.3	---	---
	2-7	5-12	3.0-8.0	5.6-7.3	---	---
	7-26	22-35	10.0-18.0	5.6-7.8	---	---
	26-60	18-30	9.0-16.0	7.4-8.4	5-15	---
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-9	2-10	2.0-8.0	5.6-7.3	---	---
	9-17	10-18	5.0-10.0	5.6-7.3	---	---
	17-60	1-5	1.0-5.0	7.4-8.4	5-15	---
951C:						
Nebish----------	0-3	5-20	4.0-14.0	5.6-7.3	---	---
	3-11	5-12	3.0-8.0	5.6-7.3	---	---
	11-26	22-35	10.0-18.0	5.6-7.8	---	---
	26-60	18-30	9.0-16.0	7.4-8.4	5-15	---
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-9	2-10	2.0-8.0	5.6-7.3	---	---
	9-15	10-18	5.0-10.0	5.6-7.3	---	---
	15-60	1-5	1.0-5.0	7.4-8.4	5-15	---
951E:						
Nebish----------	0-3	5-20	4.0-14.0	5.6-7.3	---	---
	3-11	5-12	3.0-8.0	5.6-7.3	---	---
	11-27	22-35	10.0-18.0	5.6-7.8	---	---
	27-60	18-30	9.0-16.0	7.4-8.4	5-15	---
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-8	2-10	2.0-8.0	5.6-7.3	---	---
	8-16	10-18	5.0-10.0	5.6-7.3	---	---
	16-60	1-5	1.0-5.0	7.4-8.4	5-15	---
1015:						
Udipsamments----	0-14	1-15	1.0-5.0	6.6-7.3	---	---
	14-60	1-10	1.0-3.0	6.6-7.3	---	---
	60-80	1-10	1.0-3.0	7.4-8.4	0-5	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1016:						
Udorthents------	0-60	---	---	---	---	---
	60-80	---	---	---	---	---
1027:						
Udorthents.						
1030:						
Pits.						
Udipsamments----	0-14	1-15	1.0-5.0	6.6-7.3	---	---
	14-60	1-10	1.0-3.0	6.6-7.3	---	---
	60-80	1-10	1.0-3.0	7.4-8.4	0-5	---
1104B:						
Waukon----------	0-9	12-27	9.0-28.0	6.1-7.3	---	---
	9-17	18-35	7.0-21.0	6.1-8.4	0-30	---
	17-60	18-30	7.0-18.0	7.4-8.4	5-30	---
Dorset----------	0-8	4-18	10.0-23.0	5.6-7.3	---	---
	8-14	10-18	7.0-17.0	5.6-7.3	---	---
	14-60	0-5	0.0-5.0	7.4-8.4	5-15	---
1104C:						
Waukon----------	0-8	12-27	9.0-28.0	6.1-7.3	---	---
	8-21	18-35	7.0-21.0	6.1-8.4	0-30	---
	21-60	18-30	7.0-18.0	7.4-8.4	5-30	---
Dorset----------	0-7	4-18	10.0-23.0	5.6-7.3	---	---
	7-16	10-18	7.0-17.0	5.6-7.3	---	---
	16-60	0-5	0.0-5.0	7.4-8.4	5-15	---
1111:						
Nidaros---------	0-24	---	110-170	4.5-7.8	---	---
	24-38	8-35	13.0-51.0	5.6-8.4	---	---
	38-60	0-4	1.0-3.0	5.6-8.4	0-5	---
1113:						
Haslie----------	0-20	---	140-180	5.6-7.8	---	---
	20-60	18-35	10.0-45.0	7.4-8.4	60-80	---
Seelyeville-----	0-18	---	140-200	4.5-7.3	---	---
	18-60	---	140-200	4.5-7.3	---	---
Cathro----------	0-23	---	150-230	4.5-7.8	---	---
	23-60	10-30	2.0-20.0	5.6-8.4	5-25	---
1125B:						
Sverdrup--------	0-10	10-18	8.0-20.0	6.1-7.3	---	---
	10-25	6-18	4.0-17.0	6.1-7.8	0-15	---
	25-60	0-10	0.0-6.0	7.4-8.4	5-30	---
Abbeylake-------	0-9	2-10	3.0-15.0	6.1-7.3	0-15	---
	9-28	0-10	1.0-8.0	6.1-7.3	0-15	---
	28-60	0-3	1.0-5.0	7.4-8.4	5-30	---
1125C:						
Sverdrup--------	0-10	10-18	8.0-20.0	6.1-7.3	---	---
	10-41	6-18	4.0-17.0	6.1-7.8	0-15	---
	41-60	0-10	0.0-6.0	7.4-8.4	5-30	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1125C:						
Abbeylake-------	0-9	2-10	3.0-15.0	6.1-7.3	0-15	---
	9-26	0-10	1.0-8.0	6.1-7.3	0-15	---
	26-60	0-3	1.0-5.0	7.4-8.4	5-30	---
1126B:						
Verndale--------	0-8	7-12	7.0-15.0	5.6-7.3	---	---
	8-15	7-18	3.0-12.0	5.6-7.3	---	---
	15-47	2-6	2.0-4.0	5.6-7.3	---	---
	47-60	0-4	0.0-3.0	6.1-8.4	0-30	---
Nymore----------	0-7	2-12	3.0-13.0	5.1-6.5	---	---
	7-41	0-5	0.0-5.0	5.1-7.3	---	---
	41-60	0-5	0.0-1.0	5.1-7.8	---	---
1127A:						
Bootlake--------	0-7	5-15	4.0-15.0	5.6-7.3	---	---
	7-13	2-10	1.0-10.0	5.6-7.3	---	---
	13-18	10-18	5.0-12.0	5.6-7.3	---	---
	18-60	1-5	1.0-5.0	7.4-8.4	5-20	---
Graycalm--------	0-7	0-10	4.0-12.0	4.5-6.5	---	---
	7-22	0-15	2.0-4.0	4.5-7.3	---	---
	22-56	0-10	1.0-5.0	4.5-7.3	---	---
	56-60	0-10	0.0-2.0	5.6-8.4	---	---
1127B:						
Bootlake--------	0-6	5-15	4.0-15.0	5.6-7.3	---	---
	6-10	2-10	1.0-10.0	5.6-7.3	---	---
	10-16	10-18	5.0-12.0	5.6-7.3	---	---
	16-60	1-5	1.0-5.0	7.4-8.4	5-20	---
Graycalm--------	0-6	0-10	4.0-12.0	4.5-6.5	---	---
	6-37	0-15	2.0-4.0	4.5-7.3	---	---
	37-60	0-10	1.0-5.0	4.5-7.3	---	---
1128:						
Cathro----------	0-8	---	100-190	4.5-6.5	---	---
	8-22	---	100-190	4.5-6.5	---	---
	22-60	6-30	0.0-10.0	5.6-8.4	---	---
1129:						
Lindaas---------	0-14	27-35	24.0-42.0	6.6-7.3	---	---
	14-29	35-60	25.0-54.0	6.6-7.3	---	---
	29-60	25-40	16.0-34.0	7.4-8.4	20-30	---
1130:						
Wolverton-------	0-8	10-20	20.0-40.0	7.4-8.4	15-25	---
	8-12	5-15	20.0-40.0	7.4-8.4	15-25	---
	12-41	2-10	15.0-30.0	7.4-8.4	10-20	---
	41-60	18-35	10.0-20.0	7.4-8.4	10-20	---
1131B:						
Verndale--------	0-12	7-12	7.0-15.0	5.6-7.3	---	---
	12-16	7-18	3.0-12.0	5.6-7.3	---	---
	16-35	2-6	2.0-4.0	5.6-7.3	---	---
	35-60	0-4	0.0-3.0	6.1-8.4	0-30	---
Abbeylake-------	0-7	2-10	3.0-15.0	6.1-7.3	0-15	---
	7-22	0-10	1.0-8.0	6.1-7.3	0-15	---
	22-60	0-3	1.0-5.0	7.4-8.4	5-30	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1132B:						
Eagleview--------	0-9	2-10	10.0-15.0	5.6-7.3	---	---
	9-28	2-10	10.0-15.0	5.6-7.3	---	---
	28-48	2-10	5.0-10.0	6.1-7.3	---	---
Balmlake---------	0-7	3-12	5.0-10.0	5.1-6.5	---	---
	7-17	3-12	3.0-7.0	5.1-6.5	---	---
	17-24	8-18	5.0-10.0	5.6-6.5	---	---
	24-60	6-14	4.0-8.0	7.4-8.4	---	---
1132C:						
Eagleview--------	0-7	2-10	10.0-15.0	5.6-7.3	---	---
	7-23	2-10	10.0-15.0	5.6-7.3	---	---
	23-37	2-10	5.0-10.0	6.1-7.3	---	---
	37-60	2-10	0.0-5.0	6.1-8.4	0-10	---
Balmlake---------	0-3	3-12	5.0-10.0	5.1-6.5	---	---
	3-22	3-12	3.0-7.0	5.1-6.5	---	---
	22-29	8-18	5.0-10.0	5.6-6.5	---	---
	29-60	6-14	4.0-8.0	7.4-8.4	---	---
1132E:						
Eagleview--------	0-3	2-10	10.0-15.0	5.6-7.3	---	---
	3-15	2-10	10.0-15.0	5.6-7.3	---	---
	15-46	2-10	5.0-10.0	6.1-7.3	---	---
	46-60	2-10	0.0-5.0	6.1-8.4	0-10	---
Balmlake---------	0-3	3-12	5.0-10.0	5.1-6.5	---	---
	3-17	3-12	3.0-7.0	5.1-6.5	---	---
	17-27	8-18	5.0-10.0	5.6-6.5	---	---
	27-60	6-14	4.0-8.0	7.4-8.4	---	---
1135:						
Foxlake----------	0-19	35-60	25.0-50.0	6.6-7.8	0-20	---
	19-38	35-60	18.0-40.0	6.6-7.8	0-30	---
	38-49	35-60	18.0-40.0	7.4-8.4	20-30	---
	49-60	35-60	18.0-40.0	7.4-8.4	10-20	---
1136:						
Nidaros----------	0-31	---	110-170	4.5-7.8	---	---
	31-49	8-35	13.0-51.0	5.6-8.4	---	---
	49-60	0-4	1.0-3.0	5.6-8.4	0-5	---
1137B:						
Birchlake--------	0-8	30-40	21.0-30.0	6.1-7.3	---	---
	8-27	35-60	19.0-40.0	6.1-7.3	---	---
	27-60	30-40	15.0-21.0	7.4-8.4	15-30	---
	40-80	30-40	15.0-21.0	7.4-8.4	10-20	---
1137C:						
Birchlake--------	0-8	30-40	21.0-30.0	6.1-7.3	---	---
	8-17	35-60	19.0-40.0	6.1-7.3	---	---
	17-60	30-40	15.0-21.0	7.4-8.4	15-30	---
	40-80	30-40	15.0-21.0	7.4-8.4	10-20	---
1137D:						
Birchlake--------	0-7	30-40	21.0-30.0	6.1-7.3	---	---
	7-15	35-60	19.0-40.0	6.1-7.3	---	---
	15-60	30-40	15.0-21.0	7.4-8.4	15-30	---
	40-80	30-40	15.0-21.0	7.4-8.4	10-20	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1137E:						
Birchlake-------	0-7	30-40	21.0-30.0	6.1-7.3	---	---
	7-16	35-60	19.0-40.0	6.1-7.3	---	---
	16-60	30-40	15.0-21.0	7.4-8.4	15-30	---
	40-80	30-40	15.0-21.0	7.4-8.4	10-20	---
1138:						
Rushlake--------	0-7	3-10	2.0-12.0	6.1-7.8	0-15	---
	7-60	1-10	1.0-6.0	7.4-8.4	5-30	---
Hangaard--------	0-13	8-18	10.0-26.0	6.6-7.8	---	---
	13-60	2-10	2.0-6.0	7.4-8.4	5-15	---
1140B:						
Eagleview-------	0-9	2-10	10.0-15.0	5.6-7.3	---	---
	9-22	2-10	10.0-15.0	5.6-7.3	---	---
	22-40	2-10	5.0-10.0	6.1-7.3	---	---
	40-60	2-10	0.0-5.0	6.1-8.4	0-10	---
Snellman--------	0-7	5-18	4.0-16.0	5.1-6.5	---	---
	7-18	5-15	3.0-14.0	5.1-6.5	---	---
	18-34	18-30	8.0-16.0	5.6-7.3	---	---
	34-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
1140C:						
Eagleview-------	0-10	2-10	10.0-15.0	5.6-7.3	---	---
	10-30	2-10	10.0-15.0	5.6-7.3	---	---
	30-49	2-10	5.0-10.0	6.1-7.3	---	---
	49-60	2-10	0.0-5.0	6.1-8.4	0-10	---
Snellman--------	0-3	5-18	4.0-16.0	5.1-6.5	---	---
	3-11	5-15	3.0-14.0	5.1-6.5	---	---
	11-21	18-30	8.0-16.0	5.6-7.3	---	---
	21-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
1149:						
Hamerly---------	0-10	27-35	---	6.6-8.4	---	---
	10-26	18-35	---	7.4-8.4	---	---
	26-60	18-35	---	7.4-8.4	---	---
1195B:						
Sybil-----------	0-5	3-10	3.0-10.0	5.6-7.3	---	---
	5-10	3-15	1.0-10.0	5.6-7.3	---	---
	10-15	8-18	4.0-13.0	5.6-7.3	---	---
	15-32	3-10	1.0-7.0	5.6-7.3	---	---
	32-60	2-5	1.0-4.0	6.1-8.4	0-3	---
Eagleview-------	0-7	2-10	10.0-15.0	5.6-7.3	---	---
	7-19	2-10	10.0-15.0	5.6-7.3	---	---
	19-33	2-10	5.0-10.0	6.1-7.3	---	---
	33-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1195C:						
Sybil-----------	0-8	3-10	3.0-10.0	5.6-7.3	---	---
	8-17	3-15	1.0-10.0	5.6-7.3	---	---
	17-26	8-18	4.0-13.0	5.6-7.3	---	---
	26-37	3-10	1.0-7.0	5.6-7.3	---	---
	37-60	2-5	1.0-4.0	6.1-8.4	0-3	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1195C:						
Eagleview-------	0-4	2-10	10.0-15.0	5.6-7.3	---	---
	4-15	2-10	10.0-15.0	5.6-7.3	---	---
	15-28	2-10	5.0-10.0	6.1-7.3	---	---
	28-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1195E:						
Sybil----------	0-4	5-18	6.0-19.0	5.6-7.3	---	---
	4-15	3-15	1.0-10.0	5.6-7.3	---	---
	15-19	8-18	4.0-13.0	5.6-7.3	---	---
	19-25	3-10	1.0-7.0	5.6-7.3	---	---
	25-60	2-5	1.0-4.0	6.1-8.4	0-3	---
Eagleview-------	0-5	2-10	10.0-15.0	5.6-7.3	---	---
	5-22	2-10	10.0-15.0	5.6-7.3	---	---
	22-39	2-10	5.0-10.0	6.1-7.3	---	---
	39-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1196B:						
Lida----------	0-9	5-18	6.0-19.0	5.6-7.3	---	---
	9-13	3-15	1.0-10.0	5.6-7.3	---	---
	13-25	8-18	4.0-13.0	5.6-7.3	---	---
	25-45	1-5	1.0-4.0	5.6-7.3	---	---
	45-60	1-5	1.0-4.0	7.4-8.4	3-15	---
Two Inlets------	0-7	5-10	3.0-10.0	5.6-7.3	---	---
	7-14	2-10	1.0-6.0	5.6-7.3	---	---
	14-29	5-15	2.0-9.0	6.1-7.3	---	---
	29-60	0-3	0.0-2.0	7.4-8.4	5-30	---
1196C:						
Lida----------	0-8	5-18	6.0-19.0	5.6-7.3	---	---
	8-17	3-15	1.0-10.0	5.6-7.3	---	---
	17-25	8-18	4.0-13.0	5.6-7.3	---	---
	25-41	1-5	1.0-4.0	5.6-7.3	---	---
	41-60	1-5	1.0-4.0	7.4-8.4	3-15	---
Two Inlets------	0-4	5-10	3.0-10.0	5.6-7.3	---	---
	4-9	2-10	1.0-6.0	5.6-7.3	---	---
	9-38	5-15	2.0-9.0	6.1-7.3	---	---
	38-60	0-3	0.0-2.0	7.4-8.4	5-30	---
1196E:						
Lida----------	0-3	5-18	6.0-19.0	5.6-7.3	---	---
	3-14	3-15	1.0-10.0	5.6-7.3	---	---
	14-20	8-18	4.0-13.0	5.6-7.3	---	---
	20-27	1-5	1.0-4.0	5.6-7.3	---	---
	27-60	1-5	1.0-4.0	7.4-8.4	3-15	---
Two Inlets------	0-3	5-10	3.0-10.0	5.6-7.3	---	---
	3-7	2-10	1.0-6.0	5.6-7.3	---	---
	7-21	5-15	2.0-9.0	6.1-7.3	---	---
	21-60	0-3	0.0-2.0	7.4-8.4	5-30	---
1200:						
Egglake---------	0-4	8-15	7.0-17.0	5.6-7.3	---	---
	4-9	3-10	2.0-10.0	5.6-7.3	---	---
	9-20	18-30	7.0-18.0	5.6-7.3	---	---
	20-60	10-18	4.0-11.0	7.4-8.4	10-20	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1201C:						
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-14	2-10	2.0-8.0	5.6-7.3	---	---
	14-24	10-18	5.0-10.0	5.6-7.3	---	---
	24-60	1-5	1.0-5.0	7.4-8.4	5-15	---
Snellman--------	0-2	5-18	4.0-16.0	5.1-6.5	---	---
	2-14	5-15	3.0-14.0	5.1-6.5	---	---
	14-29	18-30	8.0-16.0	5.6-7.3	---	---
	29-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
1201E:						
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-11	2-10	2.0-8.0	5.6-7.3	---	---
	11-15	10-18	5.0-10.0	5.6-7.3	---	---
	15-60	1-5	1.0-5.0	7.4-8.4	5-15	---
Snellman--------	0-2	5-18	4.0-16.0	5.1-6.5	---	---
	2-15	5-15	3.0-14.0	5.1-6.5	---	---
	15-28	18-30	8.0-16.0	5.6-7.3	---	---
	28-60	7-18	3.0-10.0	7.4-8.4	15-25	---
	41-80	7-18	3.0-10.0	7.4-8.4	5-15	---
1210:						
Paddock---------	0-9	8-15	---	5.6-7.3	---	---
	9-16	3-10	---	5.6-6.5	---	---
	16-29	8-18	---	6.6-7.3	---	---
	29-60	6-15	---	6.6-8.4	---	---
Epoufette-------	0-8	5-15	10.0-20.0	6.1-7.3	---	---
	8-17	5-15	4.0-14.0	6.1-7.3	0-5	---
	17-25	8-18	4.0-10.0	6.6-7.8	0-10	---
	25-60	0-8	1.0-5.0	7.4-8.4	5-10	---
1211:						
Egglake---------	0-4	5-15	6.0-17.0	5.6-7.3	---	---
	4-9	3-10	2.0-10.0	5.6-7.3	---	---
	9-25	18-30	7.0-18.0	5.6-7.3	---	---
	25-60	10-18	4.0-11.0	7.4-8.4	10-20	---
Cathro----------	0-17	---	120-170	4.5-7.8	---	---
	17-60	10-30	2.0-25.0	6.6-8.4	5-25	---
1225:						
Wykeham---------	0-8	5-18	6.0-23.0	5.1-6.5	---	---
	8-16	5-15	4.0-13.0	5.1-6.5	---	---
	16-37	18-30	8.0-20.0	5.6-7.3	---	---
	37-60	10-18	4.0-12.0	7.4-8.4	10-25	---
Karlstad--------	0-12	5-15	2.0-20.0	4.5-7.3	---	---
	12-18	5-18	2.0-15.0	6.1-7.3	0-15	---
	18-29	5-18	1.0-15.0	6.1-7.8	0-15	---
	29-60	1-5	0.0-1.0	7.4-8.4	5-30	---
1227:						
Quam------------	0-33	22-27	20.0-40.0	6.6-7.8	---	---
	33-50	22-35	20.0-40.0	6.6-7.8	0-15	---
	50-60	20-35	12.0-25.0	7.4-8.4	5-20	---
Cathro----------	0-24	---	150-230	4.5-7.8	---	---
	24-60	10-30	2.0-20.0	5.6-8.4	5-25	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1227:						
Urness----------	0-20	18-27	40.0-50.0	7.4-8.4	5-25	---
	20-45	18-35	40.0-50.0	7.4-8.4	5-25	---
	45-60	18-35	20.0-40.0	7.4-8.4	5-25	---
1230:						
Haslie----------	0-18	---	140-180	5.6-7.8	---	---
	18-60	18-35	10.0-45.0	7.4-8.4	60-80	---
Nidaros---------	0-38	---	110-170	4.5-7.8	---	---
	38-54	8-35	13.0-51.0	5.6-8.4	---	---
	54-60	0-4	1.0-3.0	5.6-8.4	0-5	---
1234B:						
Formdale--------	0-8	27-35	17.0-28.0	6.1-7.3	---	---
	8-15	24-35	13.0-22.0	6.6-7.8	20-30	---
	15-60	18-35	9.0-18.0	7.4-8.4	12-20	---
Buse------------	0-7	27-35	14.0-25.0	6.6-8.4	0-25	---
	7-60	18-35	11.0-16.0	7.4-8.4	12-30	---
1235B:						
Formdale--------	0-8	27-35	17.0-28.0	6.1-7.3	---	---
	8-11	24-35	13.0-22.0	6.6-7.8	20-30	---
	11-60	18-35	9.0-18.0	7.4-8.4	12-20	---
Buse------------	0-8	18-27	11.0-20.0	6.6-8.4	0-25	---
Sandberg--------	0-8	5-15	4.0-16.0	5.6-7.8	0-5	---
	8-12	0-5	1.0-6.0	7.4-8.4	10-25	---
1236B:						
Eagleview-------	0-2	2-10	10.0-15.0	5.6-7.3	---	---
	2-11	2-10	10.0-15.0	5.6-7.3	---	---
	11-48	2-10	5.0-10.0	6.1-7.3	---	---
	48-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1236C:						
Eagleview-------	0-7	2-10	10.0-15.0	5.6-7.3	---	---
	7-23	2-10	10.0-15.0	5.6-7.3	---	---
	23-37	2-10	5.0-10.0	6.1-7.3	---	---
	37-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1236E:						
Eagleview-------	0-3	2-10	10.0-15.0	5.6-7.3	---	---
	3-16	2-10	10.0-15.0	5.6-7.3	---	---
	16-40	2-10	5.0-10.0	6.1-7.3	---	---
	40-60	2-10	0.0-5.0	6.1-8.4	0-10	---
1238E:						
Two Inlets------	0-2	2-10	2.0-8.0	5.6-7.3	---	---
	2-10	2-10	1.0-6.0	5.6-7.3	---	---
	10-33	5-15	2.0-9.0	6.1-7.3	---	---
	33-60	0-3	0.0-2.0	7.4-8.4	5-30	---
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-12	2-10	2.0-8.0	5.6-7.3	---	---
	12-18	10-18	5.0-10.0	5.6-7.3	---	---
	18-60	1-5	1.0-5.0	7.4-8.4	5-15	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1242D:						
Sandberg--------	0-7	5-15	4.0-16.0	5.6-7.8	0-5	---
	7-19	0-5	1.0-6.0	7.4-8.4	10-25	---
	19-60	0-5	1.0-4.0	7.4-8.4	5-10	---
Arvilla---------	0-7	6-18	5.0-20.0	6.1-8.4	---	---
	7-17	6-18	5.0-15.0	6.6-8.4	---	---
	17-60	2-10	1.0-5.0	7.4-8.4	1-5	---
1243B:						
Sol----------	0-3	4-16	4.0-14.0	5.1-6.5	---	---
	3-17	2-12	1.0-6.0	5.1-6.5	---	---
	17-30	18-27	9.0-14.0	5.6-7.3	---	---
	30-60	8-18	2.0-9.0	7.4-7.8	10-20	---
1243C:						
Sol----------	0-2	4-16	4.0-14.0	5.1-6.5	---	---
	2-18	2-12	1.0-6.0	5.1-6.5	---	---
	18-30	18-27	9.0-14.0	5.6-7.3	---	---
	30-60	8-18	2.0-9.0	7.4-7.8	10-20	---
1243E:						
Sol----------	0-3	4-16	4.0-14.0	5.1-6.5	---	---
	3-18	2-12	1.0-6.0	5.1-6.5	---	---
	18-36	18-27	9.0-14.0	5.6-7.3	---	---
	36-60	8-18	2.0-9.0	7.4-7.8	10-20	---
1244B:						
Sol----------	0-2	4-16	4.0-14.0	5.1-6.5	---	---
	2-21	2-12	1.0-6.0	5.1-6.5	---	---
	21-30	18-27	9.0-14.0	5.6-7.3	---	---
	30-60	8-18	2.0-9.0	7.4-7.8	10-20	---
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-13	2-10	2.0-8.0	5.6-7.3	---	---
	13-21	10-18	5.0-10.0	5.6-7.3	---	---
	21-60	1-5	1.0-5.0	7.4-8.4	5-15	---
1244C:						
Sol----------	0-2	4-16	4.0-14.0	5.1-6.5	---	---
	2-22	2-12	1.0-6.0	5.1-6.5	---	---
	22-31	18-27	9.0-14.0	5.6-7.3	---	---
	31-60	8-18	2.0-9.0	7.4-7.8	10-20	---
Sugarbush-------	0-2	5-15	4.0-12.0	5.6-7.3	---	---
	2-18	2-10	2.0-8.0	5.6-7.3	---	---
	18-38	10-18	5.0-10.0	5.6-7.3	---	---
	38-60	1-5	1.0-5.0	7.4-8.4	5-15	---
1244E:						
Sol----------	0-3	4-16	4.0-14.0	5.1-6.5	---	---
	3-23	2-12	1.0-6.0	5.1-6.5	---	---
	23-30	18-27	9.0-14.0	5.6-7.3	---	---
	30-60	8-18	2.0-9.0	7.4-7.8	10-20	---
Sugarbush-------	0-3	5-15	4.0-12.0	5.6-7.3	---	---
	3-17	2-10	2.0-8.0	5.6-7.3	---	---
	17-47	10-18	5.0-10.0	5.6-7.3	---	---
	47-60	1-5	1.0-5.0	7.4-8.4	5-15	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1246:						
Winger----------	0-15	27-35	---	7.4-8.4	---	---
	15-37	18-35	---	7.4-8.4	---	---
	37-60	18-32	---	7.4-8.4	---	---
1247D:						
Corliss---------	0-9	2-10	3.0-12.0	6.1-7.8	0-15	---
	9-16	0-10	1.0-6.0	6.1-7.8	0-15	---
	16-60	0-5	0.0-3.0	7.4-8.4	5-30	---
Dorset----------	0-9	4-18	10.0-23.0	5.6-7.3	---	---
	9-17	10-18	7.0-17.0	5.6-7.3	---	---
	17-25	5-10	3.0-8.0	7.4-8.4	10-25	---
	25-60	0-5	0.0-5.0	7.4-8.4	5-15	---
1248C:						
Nymore----------	0-7	2-12	3.0-13.0	5.1-6.5	---	---
	7-55	0-5	0.0-5.0	5.1-7.3	---	---
	55-60	0-5	0.0-1.0	5.1-7.8	---	---
Verndale--------	0-6	7-12	7.0-15.0	5.6-7.3	---	---
	6-27	7-18	3.0-12.0	5.6-7.3	---	---
	27-48	2-6	2.0-4.0	5.6-7.3	---	---
	48-60	0-4	0.0-3.0	6.1-8.4	0-30	---
1249C:						
Graycalm--------	0-8	0-10	4.0-12.0	4.5-6.5	---	---
	8-18	0-15	2.0-4.0	4.5-7.3	---	---
	18-37	0-10	1.0-5.0	4.5-7.3	---	---
	37-60	0-10	0.0-2.0	5.6-8.4	---	---
Bootlake--------	0-8	5-15	4.0-15.0	5.6-7.3	---	---
	8-17	2-10	1.0-10.0	5.6-7.3	---	---
	17-27	10-18	5.0-12.0	5.6-7.3	---	---
	27-60	1-5	1.0-5.0	7.4-8.4	5-20	---
1250C:						
Abbeylake-------	0-9	2-10	3.0-15.0	6.1-7.3	0-15	---
	9-16	0-10	1.0-8.0	6.1-7.3	0-15	---
	16-60	0-3	1.0-5.0	7.4-8.4	5-30	---
Verndale--------	0-8	7-12	7.0-15.0	5.6-7.3	---	---
	8-14	7-18	3.0-12.0	5.6-7.3	---	---
	14-28	2-6	2.0-4.0	5.6-7.3	---	---
	28-60	0-4	0.0-3.0	6.1-8.4	0-30	---
1251:						
Lamoure---------	0-41	20-26	22.0-29.0	7.4-8.4	0-10	0-4
	41-53	20-34	24.0-31.0	7.4-8.4	9-20	0-4
	53-60	20-34	16.0-23.0	7.4-8.4	4-20	0-4
1252B:						
Bootlake--------	0-3	5-15	4.0-15.0	5.6-7.3	---	---
	3-14	2-10	1.0-10.0	5.6-7.3	---	---
	14-41	10-18	5.0-12.0	5.6-7.3	---	---
	41-60	1-5	1.0-5.0	7.4-8.4	5-20	---
Eagleview-------	0-2	2-10	10.0-15.0	5.6-7.3	---	---
	2-12	2-10	10.0-15.0	5.6-7.3	---	---
	12-42	2-10	5.0-10.0	6.1-7.3	---	---
	42-60	2-10	0.0-5.0	6.1-8.4	0-10	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1263C:						
Eagleview-------	0-3	2-10	10.0-15.0	5.6-7.3	---	---
	3-17	2-10	10.0-15.0	5.6-7.3	---	---
	17-32	2-10	5.0-10.0	6.1-7.3	---	---
	32-60	2-10	0.0-5.0	6.1-8.4	0-10	---
Bootlake--------	0-3	5-15	4.0-15.0	5.6-7.3	---	---
	3-15	2-10	1.0-10.0	5.6-7.3	---	---
	15-24	10-18	5.0-12.0	5.6-7.3	---	---
	24-60	1-5	1.0-5.0	7.4-8.4	5-20	---
1291:						
Sedgeville------	0-8	0-23	10.0-45.0	6.1-8.4	0-20	---
	8-34	8-17	5.0-20.0	6.1-8.4	0-20	---
	34-60	2-5	2.0-5.0	6.6-8.4	0-20	---
1306:						
Karlstad--------	0-15	5-15	2.0-20.0	4.5-7.3	---	---
	15-27	5-18	2.0-15.0	6.1-7.3	0-15	---
	27-60	1-5	0.0-1.0	7.4-8.4	5-30	---
1317:						
Vallers---------	0-15	28-35	15.0-28.0	7.4-8.4	12-25	0-4
	15-23	18-35	10.0-18.0	7.4-8.4	20-35	0-4
	23-60	18-35	8.0-16.0	7.4-8.4	12-25	0-4
1318:						
Darnen----------	0-56	18-27	15.0-30.0	6.6-7.8	---	---
	56-60	18-30	10.0-20.0	6.1-7.8	0-5	---
1319B:						
Rockwood--------	0-4	5-15	---	5.1-6.5	---	---
	4-14	5-10	---	5.1-6.5	---	---
	14-19	8-18	---	5.6-7.3	---	---
	19-30	8-18	---	5.6-7.3	---	---
	30-60	7-15	---	6.1-8.4	---	---
1319C:						
Rockwood--------	0-7	5-15	---	5.1-6.5	---	---
	7-16	5-10	---	5.1-6.5	---	---
	16-23	8-18	---	5.6-7.3	---	---
	23-31	8-18	---	5.6-7.3	---	---
	31-60	7-15	---	6.1-8.4	---	---
1319D:						
Rockwood--------	0-2	5-15	---	5.1-6.5	---	---
	2-15	5-10	---	5.1-6.5	---	---
	15-21	8-18	---	5.6-7.3	---	---
	21-32	8-18	---	5.6-7.3	---	---
	32-60	7-15	---	6.1-8.4	---	---
1320B:						
Blowers---------	0-3	5-15	---	5.1-7.3	---	---
	3-14	5-10	---	5.1-6.5	---	---
	14-22	8-18	---	5.6-7.3	---	---
	22-32	8-18	---	5.6-7.3	---	---
	32-60	7-15	---	6.6-8.4	---	---
1321:						
Paddock---------	0-4	8-15	---	5.6-7.3	---	---
	4-16	3-10	---	5.6-6.5	---	---
	16-43	8-18	---	6.6-7.3	---	---
	43-60	6-15	---	6.6-8.4	---	---

CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Cation-exchange capacity	Soil reaction	Calcium carbonate	Salinity
	In	Pct	meq/100g	pH	Pct	mmhos/cm
1365:						
Hillview--------	0-8	5-15	6.0-15.0	5.1-7.3	---	---
	8-19	3-12	3.0-8.0	5.1-6.5	---	---
	19-28	8-18	5.0-11.0	5.1-7.3	---	---
	28-60	3-12	2.0-7.0	5.1-8.4	0-12	---
1825B:						
Seelyeville-----	0-60	---	140-200	6.1-7.8	0-15	---
1878:						
Hamre-----------	0-14	---	160-200	5.1-7.8	0-5	---
	14-19	18-35	16.0-28.0	5.1-7.8	0-10	---
	19-60	18-35	10.0-22.0	7.4-8.4	5-30	---
1938:						
Lakepark--------	0-8	27-35	25.0-40.0	6.1-7.8	---	---
	8-28	20-35	12.0-30.0	6.1-7.8	---	---
	28-34	22-35	13.0-30.0	6.6-7.8	---	---
	34-60	22-35	13.0-30.0	7.4-8.4	10-20	---
1942:						
Forada----------	0-10	10-22	14.0-45.0	6.6-7.8	0-15	---
	10-21	8-18	4-120	6.6-7.8	0-15	---
	21-60	0-5	0.0-5.0	7.4-8.4	5-30	---
1967:						
Hamerly---------	0-9	27-35	---	6.6-8.4	---	---
	9-20	18-35	---	7.4-8.4	---	---
	20-60	18-35	---	7.4-8.4	---	---
Vallers---------	0-15	28-35	15.0-28.0	7.4-8.4	12-25	0-4
	15-25	18-35	10.0-18.0	7.4-8.4	20-35	0-4
	25-60	18-35	8.0-16.0	7.4-8.4	12-25	0-4
1975:						
Oylen-----------	0-13	7-12	8.0-14.0	6.1-7.3	---	---
	13-22	7-18	5.0-13.0	6.1-7.3	---	---
	22-52	2-6	1.0-3.0	6.1-7.3	---	---
	52-60	0-4	0.0-2.0	6.6-8.4	0-15	---
1997:						
Vallers---------	0-15	28-35	15.0-28.0	7.4-8.4	12-25	0-4
	15-27	18-35	10.0-18.0	7.4-8.4	20-35	0-4
	27-60	18-35	8.0-16.0	7.4-8.4	12-25	0-4
Hamerly---------	0-9	27-35	---	6.6-8.4	---	---
	9-21	18-35	---	7.4-8.4	---	---
	21-60	18-35	---	7.4-8.4	---	---
Winger----------	0-22	27-35	27.0-38.0	7.4-8.4	5-20	---
	22-35	18-35	9.0-18.0	7.4-8.4	15-35	---
	35-60	18-32	9.0-16.0	7.4-8.4	15-30	---

WATER FEATURES

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
20B:							
Chapett	B	None	---	---	>6.0	---	---
20C2:							
Chapett	B	None	---	---	>6.0	---	---
20E:							
Chapett	B	None	---	---	>6.0	---	---
26:							
Aazdahl	B	None	---	---	2.5-3.5	Apparent	Mar-May
33B:							
Barnes	B	None	---	---	>6.0	---	---
36:							
Flom	B/D	None	---	---	0.5-1.5	Apparent	Nov-Jul
38B:							
Waukon	B	None	---	---	>6.0	---	---
38C:							
Waukon	B	None	---	---	>6.0	---	---
38E:							
Waukon	B	None	---	---	>6.0	---	---
40B:							
Nebish	B	None	---	---	>6.0	---	---
40C:							
Nebish	B	None	---	---	>6.0	---	---
40E:							
Nebish	B	None	---	---	>6.0	---	---
47:							
Colvin	C/D	None	---	---	0.5-1.5	Apparent	Apr-Jul
63:							
Rockwell	B/D	None	---	---	0.5-1.5	Apparent	Apr-Jul
108:							
McIntosh	B	None	---	---	2.5-3.5	Apparent	Apr-Nov
111:							
Hangaard	D	None	---	---	0.5-1.5	Apparent	Apr-Jul
121:							
Wykeham	B	None	---	---	2.5-4.0	Apparent	Apr-Jun
125:							
Beltrami	B	None	---	---	2.5-4.0	Apparent	Nov-Jun
133A:							
Dalbo	B	None	---	---	2.5-4.0	Apparent	Nov-May
133B:							
Dalbo	B	None	---	---	2.5-4.0	Apparent	Nov-May
133C:							
Dalbo	B	None	---	---	2.5-4.0	Apparent	Nov-May

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
133E:							
Dalbo	B	None	---	---	2.5-4.0	Apparent	Nov-May
137:							
Dovray	C/D	None	---	---	+1-0.5	Apparent	Jan-Dec
141B:							
Egeland	B	None	---	---	>6.0	---	---
141C:							
Egeland	B	None	---	---	>6.0	---	---
168B:							
Forman	B	None	---	---	>6.0	---	---
168C2:							
Forman	B	None	---	---	>6.0	---	---
168D2:							
Forman	B	None	---	---	>6.0	---	---
168E:							
Forman	B	None	---	---	>6.0	---	---
171B:							
Formdale	B	None	---	---	>6.0	---	---
180:							
Gonvick	B	None	---	---	2.5-4.0	Apparent	Nov-Jun
184:							
Hamerly	C	None	---	---	2.0-4.0	Apparent	Apr-Jun
191:							
Epoufette	B/D	None	---	---	0.5-2.0	Apparent	Nov-Jun
202:							
Meehan	B	None	---	---	1.0-3.0	Apparent	Oct-Jun
207D:							
Nymore	A	None	---	---	>6.0	---	---
267B:							
Snellman	B	None	---	---	>6.0	---	---
267C:							
Snellman	B	None	---	---	>6.0	---	---
267E:							
Snellman	B	None	---	---	>6.0	---	---
315A:							
Bootlake	B	None	---	---	>6.0	---	---
315B:							
Bootlake	B	None	---	---	>6.0	---	---
332B:							
Sugarbush	B	None	---	---	>6.0	---	---
335:							
Urness	B/D	None	---	---	+1-0.5	Apparent	Jan-Dec

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
339:							
Fordville	B	None	---	---	>6.0	---	---
344:							
Quam	B/D	None	---	---	+1-0.5	Apparent	Jan-Dec
351:							
Colvin	C/D	None	---	---	+1-0.5	Apparent	Jan-Dec
375:							
Forada	B/D	None	---	---	0.5-1.5	Apparent	Oct-Jun
398:							
Winger	B/D	None	---	---	+1-0.5	Apparent	Jan-Dec
406A:							
Dorset	B	None	---	---	>6.0	---	---
406B:							
Dorset	B	None	---	---	>6.0	---	---
413:							
Osakis	B	None	---	---	2.5-4.0	Apparent	Nov-Jun
418:							
Lamoure	C	Occasional	Brief	Mar-Oct	0.0-1.5	Apparent	Oct-Jun
422B:							
Bygland	C	None	---	---	2.5-4.0	Apparent	Apr-Jun
422C:							
Bygland	C	None	---	---	2.5-4.0	Apparent	Apr-Jun
503B:							
Balmlake	B	None	---	---	>6.0	---	---
503C:							
Balmlake	B	None	---	---	>6.0	---	---
503E:							
Balmlake	B	None	---	---	>6.0	---	---
508:							
Wyndmere	B	None	---	---	1.5-3.5	Apparent	Sep-Jun
540:							
Seelyeville	A/D	None	---	---	+1-0.5	Apparent	Oct-Jun
541:							
Rifle	A/D	None	---	---	+1-1.0	Apparent	Nov-Jun
544:							
Cathro	A/D	None	---	---	+1-1.0	Apparent	Oct-Jun
564:							
Friendship	A	None	---	---	3.5-6.0	Apparent	Oct-Jun
567A:							
Verndale	B	None	---	---	>6.0	---	---
567B:							
Verndale	B	None	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
579C2:							
Formdale	B	None	---	---	>6.0	---	---
Langhei	B	None	---	---	>6.0	---	---
Sandberg	A	None	---	---	>6.0	---	---
624:							
Rosy	B	None	---	---	2.5-3.5	Apparent	Mar-Jun
701:							
Runeberg	C/D	None	---	---	+1-0.0	Apparent	Jan-Dec
711B:							
Arvilla	B	None	---	---	>6.0	---	---
Sandberg	A	None	---	---	>6.0	---	---
711C:							
Arvilla	B	None	---	---	>6.0	---	---
Sandberg	A	None	---	---	>6.0	---	---
718B:							
Naytahwaush	B	None	---	---	>6.0	---	---
718C:							
Naytahwaush	B	None	---	---	>6.0	---	---
718E:							
Naytahwaush	B	None	---	---	>6.0	---	---
721E:							
Corliss	A	None	---	---	>6.0	---	---
746:							
Haslie	A/D	None	---	---	+1-0.5	Apparent	Nov-Jul
747B:							
Audubon	C	None	---	---	3.0-6.0	Perched	Oct-Jun
753D:							
Abbeylake	A	None	---	---	>6.0	---	---
753E:							
Abbeylake	A	None	---	---	>6.0	---	---
765:							
Smiley	B/D	None	---	---	0.5-1.5	Apparent	Apr-Jul
767:							
Auganaush	C	None	---	---	0.5-1.5	Apparent	Oct-Jun
775B:							
Sugarbush	B	None	---	---	>6.0	---	---
Two Inlets	A	None	---	---	>6.0	---	---
775C:							
Sugarbush	B	None	---	---	>6.0	---	---
Two Inlets	A	None	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
776B:							
Snellman	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
776C:							
Snellman	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
776E:							
Snellman	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
778B:							
Dorset	B	None	---	---	>6.0	---	---
Corliss	A	None	---	---	>6.0	---	---
778C:							
Dorset	B	None	---	---	>6.0	---	---
Corliss	A	None	---	---	>6.0	---	---
780B:							
Audubon	C	None	---	---	3.0-6.0	Perched	Oct-Jun
Boyerlake	C	None	---	---	2.5-4.0	Apparent	Oct-Jun
780C2:							
Audubon	C	None	---	---	3.0-6.0	Perched	Oct-Jun
Boyerlake	C	None	---	---	2.5-4.0	Apparent	Oct-Jun
780D2:							
Audubon	C	None	---	---	3.0-6.0	Perched	Oct-Jun
Boyerlake	C	None	---	---	2.5-4.0	Apparent	Oct-Jun
785:							
Hamerly	C	None	---	---	1.5-3.5	Apparent	Apr-Jun
Winger	B/D	None	---	---	0.5-1.5	Apparent	Nov-Jun
786:							
Winger	B/D	None	---	---	0.5-1.5	Apparent	Nov-Jun
Hamerly	C	None	---	---	1.5-3.5	Apparent	Apr-Jun
Colvin	C/D	None	---	---	+1-0.5	Apparent	Jan-Dec
797:							
Mooselake	A/D	None	---	---	0.0-1.0	Apparent	Jan-Dec
Lupton	A/D	None	---	---	0.0-1.0	Apparent	Sep-May
867B:							
Graycalm	A	None	---	---	>6.0	---	---
Menahga	A	None	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
867C:							
Graycalm	A	None	---	---	>6.0	---	---
Menahga	A	None	---	---	>6.0	---	---
867E:							
Graycalm	A	None	---	---	>6.0	---	---
Menahga	A	None	---	---	>6.0	---	---
903B:							
Barnes	B	None	---	---	>6.0	---	---
Langhei	B	None	---	---	>6.0	---	---
903C2:							
Barnes	B	None	---	---	>6.0	---	---
Langhei	B	None	---	---	>6.0	---	---
931C2:							
Formdale	B	None	---	---	>6.0	---	---
Langhei	B	None	---	---	>6.0	---	---
942D2:							
Langhei	B	None	---	---	>6.0	---	---
Barnes	B	None	---	---	>6.0	---	---
943D2:							
Langhei	B	None	---	---	>6.0	---	---
Formdale	B	None	---	---	>6.0	---	---
943E:							
Langhei	B	None	---	---	>6.0	---	---
Formdale	B	None	---	---	>6.0	---	---
951B:							
Nebish	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
951C:							
Nebish	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
951E:							
Nebish	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
1015:							
Udipsamments	A	None	---	---	>6.0	---	---
1016:							
Udorthents	B	None	---	---	>6.0	---	---
1027:							
Udorthents.							

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1030:							
Pits.							
Udipsamments----	A	None-------	---	---	>6.0	---	---
1104B:							
Waukon----------	B	None-------	---	---	>6.0	---	---
Dorset----------	B	None-------	---	---	>6.0	---	---
1104C:							
Waukon----------	B	None-------	---	---	>6.0	---	---
Dorset----------	B	None-------	---	---	>6.0	---	---
1111:							
Nidaros---------	A/D	Frequent---	Long------	Mar-Nov	+1-0.5	Apparent---	Oct-Jun
1113:							
Haslie----------	D	None-------	---	---	+3-0.0	Apparent---	Jan-Dec
Seelyeville-----	D	None-------	---	---	+3-0.0	Apparent---	Jan-Dec
Cathro----------	D	None-------	---	---	+4-0.5	Apparent---	Jan-Dec
1125B:							
Sverdrup--------	B	None-------	---	---	>6.0	---	---
Abbeylake-------	A	None-------	---	---	>6.0	---	---
1125C:							
Sverdrup--------	B	None-------	---	---	>6.0	---	---
Abbeylake-------	A	None-------	---	---	>6.0	---	---
1126B:							
Verndale--------	B	None-------	---	---	>6.0	---	---
Nymore----------	A	None-------	---	---	>6.0	---	---
1127A:							
Bootlake--------	B	None-------	---	---	>6.0	---	---
Graycalm--------	A	None-------	---	---	>6.0	---	---
1127B:							
Bootlake--------	B	None-------	---	---	>6.0	---	---
Graycalm--------	A	None-------	---	---	>6.0	---	---
1128:							
Cathro----------	A/D	Frequent---	Long------	Mar-Nov	+1-1.0	Apparent---	Oct-Jun
1129:							
Lindaas---------	C/D	None-------	---	---	0.5-1.5	Apparent---	Oct-Jul
1130:							
Wolverton-------	B	None-------	---	---	2.5-4.0	Apparent---	Mar-Jun
1131B:							
Verndale--------	B	None-------	---	---	>6.0	---	---
Abbeylake-------	A	None-------	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1132B:							
Eagleview	A	None	---	---	>6.0	---	---
Balmlake	B	None	---	---	>6.0	---	---
1132C:							
Eagleview	A	None	---	---	>6.0	---	---
Balmlake	B	None	---	---	>6.0	---	---
1132E:							
Eagleview	A	None	---	---	>6.0	---	---
Balmlake	B	None	---	---	>6.0	---	---
1135:							
Foxlake	C	None	---	---	0.5-1.5	Perched	Oct-Jun
1136:							
Nidaros	A/D	None	---	---	+1-0.5	Apparent	Oct-Jun
1137B:							
Birchlake	C	None	---	---	2.5-4.0	Perched	Oct-Jun
1137C:							
Birchlake	C	None	---	---	2.5-4.0	Perched	Oct-Jun
1137D:							
Birchlake	C	None	---	---	2.5-4.0	Perched	Oct-Jun
Birchlake	C	None	---	---	2.5-4.0	Perched	Oct-Jun
1138:							
Rushlake	A	None	---	---	2.5-4.0	Apparent	Jan-Dec
Hangaard	D	None	---	---	0.5-1.5	Apparent	Apr-Jul
1140B:							
Eagleview	A	None	---	---	>6.0	---	---
Snellman	B	None	---	---	>6.0	---	---
1140C:							
Eagleview	A	None	---	---	>6.0	---	---
Snellman	B	None	---	---	>6.0	---	---
1149:							
Hamerly	C	None	---	---	2.0-4.0	Apparent	Apr-Jun
1195B:							
Sybil	B	None	---	---	>6.0	---	---
Eagleview	A	None	---	---	>6.0	---	---
1195C:							
Sybil	B	None	---	---	>6.0	---	---
Eagleview	A	None	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1195E:							
Sybil	B	None	---	---	>6.0	---	---
Eagleview	A	None	---	---	>6.0	---	---
1196B:							
Lida	B	None	---	---	>6.0	---	---
Two Inlets	A	None	---	---	>6.0	---	---
1196C:							
Lida	B	None	---	---	>6.0	---	---
Two Inlets	A	None	---	---	>6.0	---	---
1196E:							
Lida	B	None	---	---	>6.0	---	---
Two Inlets	A	None	---	---	>6.0	---	---
1200:							
Egglake	B	None	---	---	0.5-1.5	Apparent	Oct-Jul
1201C:							
Sugarbush	B	None	---	---	>6.0	---	---
Snellman	B	None	---	---	>6.0	---	---
1201E:							
Sugarbush	B	None	---	---	>6.0	---	---
Snellman	B	None	---	---	>6.0	---	---
1210:							
Paddock	C/D	None	---	---	1.0-2.0	Perched	Nov-Jun
Epoufette	B/D	None	---	---	0.5-2.0	Apparent	Nov-Jun
1211:							
Egglake	B	None	---	---	0.5-1.5	Apparent	Oct-Jul
Cathro	A/D	None	---	---	+1-1.0	Apparent	Oct-Jun
1225:							
Wykeham	B	None	---	---	2.5-4.0	Apparent	Apr-Jun
Karlstad	A	None	---	---	2.5-4.0	Apparent	Apr-Jul
1227:							
Quam	B/D	None	---	---	+3-0.5	Apparent	Jan-Dec
Cathro	D	None	---	---	+4-0.5	Apparent	Jan-Dec
Urness	B/D	None	---	---	+3-0.0	Apparent	Jan-Dec
1230:							
Haslie	D	None	---	---	+3-0.0	Apparent	Jan-Dec
Nidaros	D	None	---	---	+3-0.0	Apparent	Jan-Dec

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1234B:							
Formdale	B	None	---	---	>6.0	---	---
Buse	B	None	---	---	>6.0	---	---
1235B:							
Formdale	B	None	---	---	>6.0	---	---
Buse	B	None	---	---	>6.0	---	---
Sandberg	A	None	---	---	>6.0	---	---
1236B:							
Eagleview	A	None	---	---	>6.0	---	---
1236C:							
Eagleview	A	None	---	---	>6.0	---	---
1236E:							
Eagleview	A	None	---	---	>6.0	---	---
1238E:							
Two Inlets	A	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
1242D:							
Sandberg	A	None	---	---	>6.0	---	---
Arvilla	B	None	---	---	>6.0	---	---
1243B:							
Sol	B	None	---	---	>6.0	---	---
1243C:							
Sol	B	None	---	---	>6.0	---	---
1243E:							
Sol	B	None	---	---	>6.0	---	---
1244B:							
Sol	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
1244C:							
Sol	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
1244E:							
Sol	B	None	---	---	>6.0	---	---
Sugarbush	B	None	---	---	>6.0	---	---
1246:							
Winger	B/D	None	---	---	0.5-1.5	Apparent	Nov-Jun
1247D:							
Corliss	A	None	---	---	>6.0	---	---
Dorset	B	None	---	---	>6.0	---	---

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1248C:							
Nymore	A	None	---	---	>6.0	---	---
Verndale	B	None	---	---	>6.0	---	---
1249C:							
Graycalm	A	None	---	---	>6.0	---	---
Bootlake	B	None	---	---	>6.0	---	---
1250C:							
Abbeylake	A	None	---	---	>6.0	---	---
Verndale	B	None	---	---	>6.0	---	---
1251:							
Lamoure	C	Frequent	Brief	Mar-Oct	0.0-1.5	Apparent	Oct-Jun
1252B:							
Bootlake	B	None	---	---	>6.0	---	---
Eagleview	A	None	---	---	>6.0	---	---
1263C:							
Eagleview	A	None	---	---	>6.0	---	---
Bootlake	B	None	---	---	>6.0	---	---
1291:							
Sedgeville	D	Frequent	Long	Mar-Jun	+1-0.5	Apparent	Jan-Dec
1306:							
Karlstad	A	None	---	---	2.5-4.0	Apparent	Apr-Jul
1317:							
Vallers	C	None	---	---	0.5-1.5	Apparent	Apr-Jun
1318:							
Darnen	B	None	---	---	>6.0	---	---
1319B:							
Rockwood	C	None	---	---	>6.0	---	---
1319C:							
Rockwood	C	None	---	---	>6.0	---	---
1319D:							
Rockwood	C	None	---	---	>6.0	---	---
1320B:							
Blowers	B	None	---	---	2.0-3.5	Perched	Oct-Jun
1321:							
Paddock	C/D	None	---	---	1.0-2.0	Perched	Nov-Jun
1365:							
Hillview	B/D	None	---	---	0.5-1.5	Apparent	Nov-Jul
1825B:							
Seelyeville	D	None	---	---	0.0-2.0	Apparent	Jan-Dec
1878:							
Hamre	C/D	None	---	---	+1-0.5	Apparent	Jan-Dec

WATER FEATURES--Continued

Map symbol and soil name	Hydrologic group	Flooding			High water table		
		Frequency	Duration	Months	Water table depth	Kind of water table	Months
					Ft		
1938:							
Lakepark--------	B/D	None-------	---	---	0.5-1.5	Apparent---	Nov-Jun
1942:							
Forada----------	B/D	None-------	---	---	+1-0.5	Apparent---	Jan-Dec
1967:							
Hamerly---------	C	None-------	---	---	1.5-3.5	Apparent---	Apr-Jun
Vallers---------	C	None-------	---	---	0.5-1.5	Apparent---	Apr-Jun
1975:							
Oylen-----------	C	None-------	---	---	2.5-3.5	Apparent---	Oct-Jun
1997:							
Vallers---------	C	None-------	---	---	0.5-1.5	Apparent---	Apr-Jun
Hamerly---------	C	None-------	---	---	2.0-4.0	Apparent---	Apr-Jun
Winger----------	B/D	None-------	---	---	+1-0.5	Apparent---	Jan-Dec

SOIL FEATURES

Map symbol and soil name	Bedrock		Subsidence		Potential frost action	Risk of corrosion	
	Depth	Hardness	Initial	Total		Uncoated steel	Concrete
	In		In	In			
20B, 20C2, 20E: Chapett	>60	---	---	---	Moderate	Low	Low.
26: Aazdahl	>60	---	---	---	High	Moderate	Low.
33B: Barnes	>60	---	---	---	Moderate	Moderate	Low.
36: Flom	>60	---	---	---	High	High	Low.
38B, 38C, 38E: Waukon	>60	---	---	---	Moderate	Low	Low.
40B, 40C, 40E: Nebish	>60	---	---	---	Moderate	Moderate	Low.
47: Colvin	>60	---	---	---	High	High	Low.
63: Rockwell	>60	---	---	---	High	High	Low.
108: McIntosh	>60	---	---	---	High	High	Low.
111: Hangaard	>60	---	---	---	Moderate	High	Low.
121: Wykeham	>60	---	---	---	Moderate	Moderate	Moderate.
125: Beltrami	>60	---	---	---	High	Moderate	Low.
133A, 133B, 133C, 133E: Dalbo	>60	---	---	---	High	High	Moderate.
137: Dovray	>60	---	---	---	Moderate	High	Low.
141B, 141C: Egeland	>60	---	---	---	Low	Moderate	Low.
168B, 168C2, 168D2, 168E: Forman	>60	---	---	---	Moderate	High	Low.
171B: Formdale	>60	---	---	---	Moderate	Moderate	Low.
180: Gonvick	>60	---	---	---	High	Moderate	Low.
184: Hamerly	>60	---	---	---	High	High	Low.
191: Epoufette	>60	---	---	---	High	High	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			
202:							
Meehan	>60	---	---	---	Moderate	Low	Moderate.
207D:							
Nymore	>60	---	---	---	Low	Low	Moderate.
267B, 267C, 267E:							
Snellman	>60	---	---	---	Moderate	Low	Moderate.
315A, 315B:							
Bootlake	>60	---	---	---	Low	Low	Low.
332B:							
Sugarbush	>60	---	---	---	Low	Low	Low.
335:							
Urness	>60	---	---	---	High	High	Low.
339:							
Fordville	>60	---	---	---	Low	Moderate	Low.
344:							
Quam	>60	---	---	---	High	High	Low.
351:							
Colvin	>60	---	---	---	High	High	Low.
375:							
Forada	>60	---	---	---	High	High	Low.
398:							
Winger	>60	---	---	---	High	High	Low.
406A, 406B:							
Dorset	>60	---	---	---	Low	Low	Moderate.
413:							
Osakis	>60	---	---	---	Moderate	Low	Low.
418:							
Lamoure	>60	---	---	---	High	High	Moderate.
422B, 422C:							
Bygland	>60	---	---	---	High	High	Low.
503B, 503C, 503E:							
Balmlake	>60	---	---	---	Moderate	Low	Moderate.
508:							
Wyndmere	>60	---	---	---	High	High	Low.
540:							
Seelyeville	>60	---	---	50-55	High	High	Moderate.
541:							
Rifle	>60	---	---	---	High	High	Low.
544:							
Cathro	>60	---	---	19-22	High	High	Low.
564:							
Friendship	>60	---	---	---	Low	Low	High.

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			
567A, 567B:							
Verndale	>60	---	---	---	Low	Low	Low.
579C2:							
Formdale	>60	---	---	---	Moderate	Moderate	Low.
Langhei	>60	---	---	---	Moderate	Moderate	Low.
Sandberg	>60	---	---	---	Low	Moderate	Low.
624:							
Rosy	>60	---	---	---	Moderate	Moderate	Moderate.
701:							
Runeberg	>60	---	---	---	High	High	Low.
711B, 711C:							
Arvilla	>60	---	---	---	Low	Moderate	Low.
Sandberg	>60	---	---	---	Low	Moderate	Low.
718B, 718C, 718E:							
Naytahwaush	>60	---	---	---	Moderate	Moderate	Low.
721E:							
Corliss	>60	---	---	---	Low	Low	Low.
746:							
Haslie	>60	---	---	---	High	High	Moderate.
747B:							
Audubon	>60	---	---	---	Moderate	High	Low.
753D, 753E:							
Abbeylake	>60	---	---	---	Low	Low	Low.
765:							
Smiley	>60	---	---	---	High	High	Low.
767:							
Auganaush	>60	---	---	---	High	High	Moderate.
775B, 775C:							
Sugarbush	>60	---	---	---	Low	Low	Low.
Two Inlets	>60	---	---	---	Low	Low	Low.
776B, 776C, 776E:							
Snellman	>60	---	---	---	Moderate	Low	Moderate.
Sugarbush	>60	---	---	---	Low	Low	Low.
778B, 778C:							
Dorset	>60	---	---	---	Low	Low	Moderate.
Corliss	>60	---	---	---	Low	Low	Low.
780B, 780C2, 780D2:							
Audubon	>60	---	---	---	Moderate	High	Low.
Boyerlake	>60	---	---	---	Moderate	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			
785:							
Hamerly	>60	---	---	---	High	High	Low.
Winger	>60	---	---	---	High	High	Low.
786:							
Winger	>60	---	---	---	High	High	Low.
Hamerly	>60	---	---	---	High	High	Low.
Colvin	>60	---	---	---	High	High	Low.
797:							
Mooselake	>60	---	0-12	12	High	High	High.
Lupton	>60	---	6-18	50-55	High	High	Low.
867B, 867C, 867E:							
Graycalm	>60	---	---	---	Low	Low	Moderate.
Menahga	>60	---	---	---	Low	Low	Moderate.
903B, 903C2:							
Barnes	>60	---	---	---	Moderate	Moderate	Low.
Langhei	>60	---	---	---	Moderate	Low	Low.
931C2:							
Formdale	>60	---	---	---	Moderate	Moderate	Low.
Langhei	>60	---	---	---	Moderate	Moderate	Low.
942D2:							
Langhei	>60	---	---	---	Moderate	Low	Low.
Barnes	>60	---	---	---	Moderate	Moderate	Low.
943D2, 943E:							
Langhei	>60	---	---	---	Moderate	Moderate	Low.
Formdale	>60	---	---	---	Moderate	Moderate	Low.
951B, 951C, 951E:							
Nebish	>60	---	---	---	Moderate	Moderate	Low.
Sugarbush	>60	---	---	---	Low	Low	Low.
1015:							
Udipsamments	>60	---	---	---	Low	Low	Low.
1016:							
Udorthents	>60	---	---	---	Moderate	High	Moderate.
1027:							
Udorthents.							
1030:							
Pits.							
Udipsamments	>60	---	---	---	Low	Low	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			
1104B, 1104C:							
Waukon	>60	---	---	---	Moderate	Low	Low.
Dorset	>60	---	---	---	Low	Low	Moderate.
1111:							
Nidaros	>60	---	---	25-30	High	High	Low.
1113:							
Haslie	>60	---	---	30-45	High	High	Moderate.
Seelyeville	>60	---	---	---	High		
Cathro	>60	---	---	---	High	High	Low.
1125B, 1125C:							
Sverdrup	>60	---	---	---	Low	Low	Low.
Abbeylake	>60	---	---	---	Low	Low	Low.
1126B:							
Verndale	>60	---	---	---	Low	Low	Low.
Nymore	>60	---	---	---	Low	Low	Moderate.
1127A, 1127B:							
Bootlake	>60	---	---	---	Low	Low	Low.
Graycalm	>60	---	---	---	Low	Low	Moderate.
1128:							
Cathro	>60	---	8-20	16-45	High	High	Moderate.
1129:							
Lindaas	>60	---	---	---	High	High	Low.
1130:							
Wolverton	>60	---	---	---	Moderate	Moderate	Low.
1131B:							
Verndale	>60	---	---	---	Low	Low	Low.
Abbeylake	>60	---	---	---	Low	Low	Low.
1132B, 1132C, 1132E:							
Eagleview	>60	---	---	---	Low	Low	Low.
Balmlake	>60	---	---	---	Moderate	Low	Moderate.
1135:							
Foxlake	>60	---	---	---	High	High	Low.
1136:							
Nidaros	>60	---	---	25-30	High	High	Low.
1137B, 1137C, 1137D, 1137E:							
Birchlake	>60	---	---	---	High	High	Low.
1138:							
Rushlake	>60	---	---	---	Moderate	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			
1138:							
Hangaard	>60	---	---	---	Moderate	High	Low.
1140B, 1140C:							
Eagleview	>60	---	---	---	Low	Low	Low.
Snellman	>60	---	---	---	Moderate	Low	Moderate.
1149:							
Hamerly	>60	---	---	---	High	High	Low.
1195B, 1195C, 1195E:							
Sybil	>60	---	---	---	Low	Low	Low.
Eagleview	>60	---	---	---	Low	Low	Low.
1196B, 1196C, 1196E:							
Lida	>60	---	---	---	Low	Low	Low.
Two Inlets	>60	---	---	---	Low	Low	Low.
1200:							
Egglake	>60	---	---	---	High	High	Low.
1201C, 1201E:							
Sugarbush	>60	---	---	---	Low	Low	Low.
Snellman	>60	---	---	---	Moderate	Low	Moderate.
1210:							
Paddock	>60	---	---	---	High	High	Moderate.
Epoufette	>60	---	---	---	High	High	Moderate.
1211:							
Egglake	>60	---	---	---	High	High	Low.
Cathro	>60	---	---	19-22	High	High	Low.
1225:							
Wykeham	>60	---	---	---	Moderate	Moderate	Moderate.
Karlstad	>60	---	---	---	Moderate	Low	Low.
1227:							
Quam	>60	---	---	---	High	High	Low.
Cathro	>60	---	---	---	High	High	Low.
Urness	>60	---	---	---	High	High	Low.
1230:							
Haslie	>60	---	---	30-45	High	High	Moderate.
Nidaros	>60	---	---	25-30	High	High	Low.
1234B:							
Formdale	>60	---	---	---	Moderate	Moderate	Low.
Buse	>60	---	---	---	Moderate	Low	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			
1235B:							
Formdale	>60	---	---	---	Moderate	Moderate	Low.
Buse	>60	---	---	---	Moderate	Low	Low.
Sandberg	>60	---	---	---	Low	Moderate	Low.
1236B, 1236C, 1236E:							
Eagleview	>60	---	---	---	Low	Low	Low.
1238E:							
Two Inlets	>60	---	---	---	Low	Low	Low.
Sugarbush	>60	---	---	---	Low	Low	Low.
1242D:							
Sandberg	>60	---	---	---	Low	Moderate	Low.
Arvilla	>60	---	---	---	Low	Moderate	Low.
1243B, 1243C, 1243E:							
Sol	>60	---	---	---	Moderate	High	High.
1244B, 1244C, 1244E:							
Sol	>60	---	---	---	Moderate	High	High.
Sugarbush	>60	---	---	---	Low	Low	Low.
1246:							
Winger	>60	---	---	---	High	High	Low.
1247D:							
Corliss	>60	---	---	---	Low	Low	Low.
Dorset	>60	---	---	---	Low	Low	Moderate.
1248C:							
Nymore	>60	---	---	---	Low	Low	Moderate.
Verndale	>60	---	---	---	Low	Low	Low.
1249C:							
Graycalm	>60	---	---	---	Low	Low	Moderate.
Bootlake	>60	---	---	---	Low	Low	Low.
1250C:							
Abbeylake	>60	---	---	---	Low	Low	Low.
Verndale	>60	---	---	---	Low	Low	Low.
1251:							
Lamoure	>60	---	---	---	High	High	Moderate.
1252B:							
Bootlake	>60	---	---	---	Low	Low	Low.
Eagleview	>60	---	---	---	Low	Low	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			
1263C:							
Eagleview-------	>60	---	---	---	Low---------	Low---------	Low.
Bootlake--------	>60	---	---	---	Low---------	Low---------	Low.
1291:							
Sedgeville------	>60	---	---	---	High--------	High--------	Moderate.
1306:							
Karlstad--------	>60	---	---	---	Moderate----	Low---------	Low.
1317:							
Vallers---------	>80	---	---	---	High--------	High--------	Low.
1318:							
Darnen----------	>60	---	---	---	Moderate----	High--------	Low.
1319B, 1319C, 1319D:							
Rockwood-------	>60	---	---	---	Moderate----	Low---------	Moderate.
1320B:							
Blowers---------	>60	---	---	---	High--------	Moderate----	Moderate.
1321:							
Paddock---------	>60	---	---	---	High--------	High--------	Moderate.
1365:							
Hillview--------	>60	---	---	---	High--------	High--------	Moderate.
1825B:							
Seelyeville-----	>60	---	4-12	50-55	High--------	High--------	Moderate.
1878:							
Hamre-----------	>60	---	---	---	High--------	High--------	Low.
1938:							
Lakepark--------	>60	---	---	---	High--------	High--------	Low.
1942:							
Forada----------	>60	---	---	---	High--------	Low---------	Low.
1967:							
Hamerly---------	>60	---	---	---	High--------	High--------	Low.
Vallers---------	>80	---	---	---	High--------	High--------	Low.
1975:							
Oylen-----------	>60	---	---	---	Moderate----	Moderate----	Low.
1997:							
Vallers---------	>80	---	---	---	High--------	High--------	Low.
Hamerly---------	>60	---	---	---	High--------	High--------	Low.
Winger----------	>60	---	---	---	High--------	High--------	Low.

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Glossary

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

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.

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	more than 9

Back slope. The geomorphic component that forms the steepest inclined surface and principal element of many hill slopes. Back slopes in profile are commonly steep and linear and descend to a foot slope. In terms of gradational process, back slopes are erosional forms produced mainly by mass wasting and running water.

Basal till. Compact 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.

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

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.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on a contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

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

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

Brush management. Use of mechanical, chemical, or biological methods to make conditions favorable for reseeding or to reduce or eliminate competition from woody vegetation and thus allow understory grasses and forbs to recover. Brush management increases forage production and thus reduces the

hazard of erosion. It can improve the habitat for some species of wildlife.

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

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

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.

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

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

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.

Climax plant community. The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

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 is 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 is 35 to 60 percent of these rock fragments, and extremely cobbly soil material is 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. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation 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 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. Any tillage and planting system in which a cover of crop residue is maintained on at

least 30 percent of the surface after planting in order to reduce the hazard of water erosion; in areas where wind erosion is the primary concern, a system that maintains a cover of at least 1,000 pounds of flat residue of small grain or its equivalent during the critical erosion period.

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

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—Adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Contour stripcropping (or contour farming). 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.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

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

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

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.

Cross-slope farming. Deliberately conducting farming operations on sloping farmland in such a way that tillage is across the general slope.

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

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

Delta. A body of alluvium having a surface that is nearly flat and fan shaped; deposited at or near the mouth of a river or stream where it enters a body of relatively quiet water, generally a sea or lake.

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.

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

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—These soils have very high and high hydraulic conductivity and a low water-holding capacity. They are not suited to crop production unless irrigated.

Somewhat excessively drained.—These soils have high hydraulic conductivity and a low water-holding capacity. Without irrigation, only a narrow range of crops can be grown and yields are low.

Well drained.—These soils have an intermediate or high water-holding capacity. They retain optimum amounts of moisture, but they are not wet close enough to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or yields of most field crops are affected. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained.—These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted under natural conditions. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained.—These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under

natural conditions. Poor drainage is caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.
Very poorly drained.—These soils are wet to the surface most of the time. The wetness prevents the growth of important crops (except for rice) under natural conditions.

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

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Duff. A generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from the litter on the surface to underlying pure humus.

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

Ephemeral stream. A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

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.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

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. The term is more often applied to cliffs resulting from differential erosion.

Esker. A long, narrow, sinuous, steep-sided ridge composed of irregularly stratified sand and gravel that were deposited by a subsurface stream flowing between ice walls or through ice tunnels of a retreating glacier and that were left behind when the ice melted. Eskers range from less than 1 mile to more than 100 miles in length and from 10 to 100 feet in height.

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.

Fan terrace. A relict alluvial fan, no longer a site of active deposition, incised by younger and lower alluvial surfaces.

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

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

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

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

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

Firebreak. An area cleared of flammable material to stop or help control creeping or running fires. It also serves as a line from which to work and to facilitate the movement of fire fighters and equipment. Designated roads also serve as firebreaks.

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

Flaggy soil material. Material that is, by volume, 15 to 35 percent flagstones. Very flaggy soil material is 35 to 60 percent flagstones, and extremely flaggy soil material is 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 inundation under flood-stage conditions unless protected artificially. It is generally a constructional landform consisting of sediment deposited during overflow and lateral migration of the stream.

Foot slope. The geomorphic component that forms the inner, gently inclined surface at the base of a hill slope. The surface is dominantly concave. In terms of gradational processes, a foot slope is a transition zone between an upslope site of erosion (back slope) and a downslope site of deposition (toe slope).

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.

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

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

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

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

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

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.

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

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

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 is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, as much as 3 inches (7.6 centimeters) in diameter.

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

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

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

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

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.

High-chroma zones. Zones having chroma of 3 or more. Typical color in areas of iron concentrations.

High-residue crops. Such crops as small grain and corn used for grain. If properly managed, residue from these crops can be used to control erosion until the next crop in the rotation is established. These crops return large amounts of organic matter to the soil.

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 6 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. 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-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Igneous rock. Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

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

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

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

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

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

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

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.

Kame. A moundlike hill of glacial drift, composed chiefly of stratified sand and gravel.

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

Knoll. A small, low, rounded hill rising above adjacent landforms.

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

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

Large stones (in tables). Rock fragments 3 inches (7.6 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.

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

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

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

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

Low-residue crops. Such crops as corn used for silage, peas, beans, and potatoes. Residue from these crops is not adequate to control erosion until the next crop in the rotation is established. These crops return little organic matter to the soil.

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

Marl. An earthy, unconsolidated deposit consisting chiefly of calcium carbonate mixed with clay in approximately equal amounts.

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.

Mechanical treatment. Use of mechanical equipment for seeding, brush management, and other management practices.

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

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

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

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

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

Moderately coarse textured soil. 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 glacial drift in a topographic landform resulting chiefly from the direct action of glacial ice. Some types are lateral, recessional, and terminal.

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.)

Mudstone. Sedimentary rock formed by induration of silt and clay in approximately equal amounts.

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

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

Nodules. Cemented bodies lacking visible internal structure. Calcium carbonate, iron oxide, and manganese oxide are common compounds making up nodules. If formed in place, nodules of iron oxide or manganese oxide are considered types of redoximorphic concentrations.

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. An extensive area of glaciofluvial material that was deposited by meltwater streams.

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.

Pedisediment. 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.

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

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

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

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

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

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

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

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

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 native plant community. See Climax plant community.

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.

Prescribed burning. Burning an area under conditions of weather and soil moisture and at the time of day that will result in the intensity of heat and spread required to accomplish specific forest management, wildlife, grazing, or fire hazard reduction purposes.

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

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

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

Extremely acid	less than 4.5
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 is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Road cut. A sloping surface produced by mechanical means during road construction. It is commonly on the uphill side of the road.

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

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

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

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

Saline soil. A soil containing soluble salts in an amount that impairs the growth of plants. A saline soil does not contain excess exchangeable sodium.

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

Sandstone. Sedimentary rock containing dominantly sand-sized particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk

density, and the lowest water content at saturation of all organic soil material.

Saprolite. Unconsolidated residual material underlying the soil and grading to hard bedrock below.

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.

Scarification. The act of abrading, scratching, loosening, crushing, or modifying the surface to increase water absorption or to provide a more tillable soil.

Second bottom. The first terrace above the normal flood plain (or first bottom) of a river.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

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

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.

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.

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. A depression in the landscape where limestone has been dissolved.

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

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

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.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

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

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

Small stones (in tables). Rock fragments less than 3 inches (7.6 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 substratum. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of rock fragments in a soil. Generally, it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

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).

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

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

Subsoiling. Tilling a soil below normal plow depth, ordinarily to shatter or loosen a layer that restricts roots.

Substratum. The part of the soil below the solum.

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

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 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.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances. It commonly is a massive, arcuate ridge or complex of ridges underlain by till and other types of drift.

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

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

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

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

Till. 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 or gently sloping soils that are underlain by till or consist of till. Slopes are 0 to 6 percent.

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

Toe slope. The outermost inclined surface at the base of a hill. Toe slopes are commonly gentle and linear in profile.

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.

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

Valley fill. In glaciated regions, material deposited in

stream valleys by glacial meltwater. In nonglaciated regions, alluvium deposited by heavily loaded streams.

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

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

Water bars. Smooth, shallow ditches or depressional areas that are excavated at an angle across a sloping road. They are used to reduce the downward velocity of water and divert it off and away from the road surface. Water bars can easily be driven over if constructed properly.

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

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

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically 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.

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