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**County specific computer generated reports.*

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Geary County, Kansas: Update

Map symbol	Soil name	Acres	Percent
Be	Benfield-Florence Complex, 5 To 30 Percent Slopes-----	41,322	16.0
Cc	Clime Silty Clay Loam, 20 To 40 Percent Slopes, Very Stony-----	8,389	3.2
Cf	Clime-Sogn Silty Clay Loams, 5 To 20 Percent Slopes-----	49,252	19.0
Cr	Crete Silty Clay Loam, 0 To 1 Percent Slopes-----	344	0.1
Cs	Crete Silty Clay Loam, 1 To 4 Percent Slopes-----	7,272	2.8
Ct	Crete Silty Clay Loam, 3 To 8 Percent Slopes-----	14,448	5.6
Eu	Eudora Silt Loam, Occasionally Flooded-----	3,465	1.3
Ge	Geary Silt Loam, 3 To 8 Percent Slopes-----	4,800	1.9
Gf	Geary Silt Loam, 7 To 15 Percent Slopes-----	2,764	1.1
He	Haynie Silt Loam, Frequently Flooded-----	2,260	0.9
Hf	Hobbs Silt Loam, Channeled-----	417	0.2
Hg	Hobbs Silt Loam, Occasionally Flooded-----	2,119	0.8
Hm	Holder Silt Loam, 1 To 3 Percent Slopes-----	1,303	0.5
Ho	Holder Silt Loam, 3 To 7 Percent Slopes-----	2,365	0.9
Id	Irwin Silty Clay Loam, 3 To 7 Percent Slopes-----	17,081	6.6
Ka	Kahola Silt Loam, Channeled-----	2,143	0.8
Kb	Kahola Silt Loam, Occasionally Flooded-----	8,456	3.3
Ko	Konza Silty Clay Loam, 1 To 3 Percent Slopes-----	27,182	10.5
Lm	Ladysmith Silty Clay Loam, 0 To 2 Percent Slopes-----	4,947	1.9
Lo	Longford Loam, 1 To 3 Percent Slopes-----	1,679	0.6
M-W	Miscellaneous Water-----	32	*
Mb	Mccook Silt Loam, Occasionally Flooded-----	1,120	0.4
Mc	Mccook Silt Loam, Rarely Flooded-----	1,140	0.4
Mk	Mccook-Smokyhill Silt Loams, Occasionally Flooded-----	3,446	1.3
Mu	Muir Silt Loam, Rarely Flooded-----	4,896	1.9
Oc	Orthents-----	552	0.2
Or	Orthents, Earthen Dam-----	100	*
Pt	Pits, Quarries-----	391	0.2
Ra	Reading Silt Loam, 0 To 1 Percent Slopes-----	47	*
Re	Reading Silty Clay Loam, 0 To 2 Percent Slopes-----	7,105	2.7
Sa	Sarpy Loamy Fine Sand, 0 To 4 Percent Slopes-----	568	0.2
Sc	Sarpy Gravelly Loamy Sand, 0 To 4 Percent Slopes, Occasionally Flooded---	321	0.1
Sh	Solomon Silty Clay, Occasionally Flooded-----	858	0.3
St	Sutphen Silty Clay, Occasionally Flooded-----	929	0.4
Tn	Tully Silty Clay Loam, 1 To 4 Percent Slopes-----	5,157	2.0
To	Tully Silty Clay Loam, 3 To 8 Percent Slopes-----	11,887	4.6
Vc	Valentine Loamy Fine Sand, 5 To 15 Percent Slopes-----	472	0.2
W	Water-----	12,309	4.8
We	Wells-Ortello Complex, 1 To 4 Percent Slopes-----	1,334	0.5
Wf	Wells-Ortello Complex, 4 To 8 Percent Slopes-----	3,919	1.5
	Total-----	258,591	100.0

* Less than 0.1 percent.

Nontechnical Soil Descriptions
Geary County, Kansas

Nontechnical soil descriptions describe soil properties or management considerations specific to a soil map unit or group of map units, shown in the NonTechnical Descriptions report. These descriptions are written in terminology that Non-technical users of soil survey information can understand. Nontechnical soil descriptions are a powerful tool for creating reports. These high quality, easy to read reports can be generated by conservation planners and other NRCS employees for distribution to land users. Soil map unit descriptions and National Soil Information System records are the basis for these descriptions.

Be Benfield-Florence Complex, 5 To 30 Percent Slopes

Benfield soil makes up 42 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a moderately sloping to steep backslope hillslope on upland. The runoff class is very high. The parent material consists of clayey pedisidiment derived from limestone and shale over clayey residuum weathered from calcareous shale. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 6e.

Florence soil makes up 28 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep backslope hillslope on upland. The runoff class is high. The parent material consists of gravelly residuum weathered from cherty limestone. The soil is 40 to 60 inches deep to bedrock (lithic). This soil is well drained. The slowest permeability is moderately slow. It has a low available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 6e.

Cc Clime Silty Clay Loam, 20 To 40 Percent Slopes, Very Stony

Clime soil makes up 75 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a steep to steep backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, calcareous. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 35 percent calcium carbonate. This soil is in the Limy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 7e.

Cf Clime-Sogn Silty Clay Loams, 5 To 20 Percent Slopes

Clime soil makes up 60 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey residuum weathered from shale, calcareous. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 35 percent calcium carbonate. This soil is in the Limy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 6e.

Sogn soil makes up 20 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately steep upland, hillslope. The runoff class is medium. The parent material consists of loamy residuum weathered from limestone, unspecified. The soil is 4 to 20 inches deep to bedrock (lithic). This soil is somewhat excessively drained. The slowest permeability is moderate. It has a very low available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Limy (pe30-36) range site. It is in the nonirrigated land capability classification 6s.

Cr Crete Silty Clay Loam, 0 To 1 Percent Slopes

Crete soil makes up 90 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level shoulder, summit ridge on upland. The runoff class is medium. The parent material consists of loess. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe25-34) range site. It is in the nonirrigated land capability classification 2s.

Cs Crete Silty Clay Loam, 1 To 4 Percent Slopes

Crete soil makes up 90 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope, shoulder hillslope on upland. The runoff class is high. The parent material consists of loess. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe25-34) range site. It is in the nonirrigated land capability classification 2e.

Nontechnical Soil Descriptions--Continued
Geary County, Kansas

Ct Crete Silty Clay Loam, 3 To 8 Percent Slopes

Crete soil makes up 90 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping shoulder, backslope hillslope on upland. The runoff class is very high. The parent material consists of loess. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Upland (pe25-34) range site. It is in the nonirrigated land capability classification 3e.

Eu Eudora Silt Loam, Occasionally Flooded

Eudora soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 2w.

Ge Geary Silt Loam, 3 To 8 Percent Slopes

Geary soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping footslope, backslope hillslope on upland. The runoff class is medium. The parent material consists of silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 3e.

Gf Geary Silt Loam, 7 To 15 Percent Slopes

Geary soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep backslope hillslope on upland. The runoff class is medium. The parent material consists of silty loess. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 6e.

He Haynie Silt Loam, Frequently Flooded

Haynie soil makes up 55 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is low. The parent material consists of coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 30 percent calcium carbonate. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 5w.

Hf Hobbs Silt Loam, Channeled

Hobbs soil makes up 89 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on meander belt. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe25-34) range site. It is in the nonirrigated land capability classification 5w.

Hg Hobbs Silt Loam, Occasionally Flooded

Hobbs soil makes up 89 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping <geomorphology is missing>. The runoff class is low. The parent material consists of fine-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe25-34) range site. It is in the nonirrigated land capability classification 2w.

Hm Holder Silt Loam, 1 To 3 Percent Slopes

Holder soil makes up 95 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is low. The parent material consists of silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 2e.

Nontechnical Soil Descriptions--Continued
Geary County, Kansas

Ho Holder Silt Loam, 3 To 7 Percent Slopes

Holder soil makes up 75 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of silty loess. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 3e.

Id Irwin Silty Clay Loam, 3 To 7 Percent Slopes

Irwin soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a moderately sloping backslope hillslope on upland. The runoff class is very high. The parent material consists of silty and clayey alluvium over clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is very slow. It has a moderate available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 3 percent calcium carbonate. This soil contains a very slightly saline horizon, it has a horizon that is slightly sodic. This soil is in the Clay Upland (pe30-36) range site. It is in the nonirrigated land capability classification 4e.

Ka Kahola Silt Loam, Channeled

Kahola soil makes up 75 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on meander belt. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is frequently flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 5w.

Kb Kahola Silt Loam, Occasionally Flooded

Kahola soil makes up 75 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 2w.

Ko Konza Silty Clay Loam, 1 To 3 Percent Slopes

Konza soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a gently sloping summit, shoulder ridge on upland. The runoff class is very high. The parent material consists of silty and clayey loess over silty and clayey pediment over clayey residuum weathered from limestone and shale. This soil is moderately well drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil contains a very slightly saline horizon, it has a horizon that is moderately sodic. This soil is in the Clay Pan (pe30-36) range site. It is in the nonirrigated land capability classification 3e.

Lm Ladysmith Silty Clay Loam, 0 To 2 Percent Slopes

Ladysmith soil makes up 90 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping summit, shoulder ridge on upland. The runoff class is very high. The parent material consists of clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is impermeable. It has a moderate available water capacity and a very high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the Clay Upland (pe30-36) range site. It is in the nonirrigated land capability classification 2s.

Lo Longford Loam, 1 To 3 Percent Slopes

Longford soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a gently sloping backslope hillslope on upland. The runoff class is high. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 2e.

Mb Mccook Silt Loam, Occasionally Flooded

Mccook soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level stream terrace on river valley. The runoff class is low. The parent material consists of weakly stratified calcareous coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe25-34) range site. It is in the nonirrigated land capability classification 2w.

Nontechnical Soil Descriptions--Continued
Geary County, Kansas

Mc Mccook Silt Loam, Rarely Flooded

Mccook soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level stream terrace on river valley. The runoff class is low. The parent material consists of weakly stratified calcareous coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe25-34) range site. It is in the nonirrigated land capability classification 1.

Mk Mccook-Smokyhill Silt Loams, Occasionally Flooded

Mccook soil makes up 63 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level stream terrace on river valley. The runoff class is low. The parent material consists of weakly stratified calcareous coarse-silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 10 percent calcium carbonate. This soil is in the Loamy Lowland (pe25-34) range site. It is in the nonirrigated land capability classification 2w.

Smokyhill soil makes up 25 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level depression on flood plain on river valley. The runoff class is negligible. The parent material consists of clayey alluvium over silty alluvium. This soil is moderately well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is occasionally flooded and is rare ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Clay Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 2w.

Mu Muir Silt Loam, Rarely Flooded

Muir soil makes up 94 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on alluvial plain. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderate. It has a very high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the Loamy Terrace (pe25-34) range site. It is in the nonirrigated land capability classification 1.

Oc Orthents

Orthents soil makes up 100 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to strongly sloping <geomorphology is missing>. <runoff is missing> <parent material is missing> This soil is poorly drained. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. It is in the nonirrigated land capability classification 7s.

Ra Reading Silt Loam, 0 To 1 Percent Slopes

Reading soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a nearly level flood plain on valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 1.

Re Reading Silty Clay Loam, 0 To 2 Percent Slopes

Reading soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on valley. The runoff class is low. The parent material consists of silty alluvium. This soil is well drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is rarely flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 1.

Sa Sarpy Loamy Fine Sand, 0 To 4 Percent Slopes

Sarpy soil makes up 90 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to moderately sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 2 percent calcium carbonate. This soil is in the Sandy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 4s.

Sc Sarpy Gravelly Loamy Sand, 0 To 4 Percent Slopes, Occasionally Flooded

Sarpy soil makes up 90 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level to moderately sloping flood plain on river valley. The runoff class is negligible. The parent material consists of sandy alluvium. This soil is excessively drained. The slowest permeability is rapid. It has a very low available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 6s.

Nontechnical Soil Descriptions--Continued
Geary County, Kansas

Sh Solomon Silty Clay, Occasionally Flooded

Solomon soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level ephemeral oxbow lake on flood plain on river valley. The runoff class is negligible. The parent material consists of clayey alluvium. This soil is poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is frequent ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 4 percent calcium carbonate. This soil is in the Clay Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 3w.

St Sutphen Silty Clay, Occasionally Flooded

Sutphen soil makes up 80 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is high. The parent material consists of clayey alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a moderate available water capacity and a very high shrink swell potential. This soil is occasionally flooded and is occasional ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 3 percent calcium carbonate. This soil is in the Clay Lowland (pe30-36) range site. It is in the nonirrigated land capability classification 3w.

Tn Tully Silty Clay Loam, 1 To 4 Percent Slopes

Tully soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping footslope hillslope on upland. The runoff class is high. The parent material consists of clayey colluvium. This soil is well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 2e.

To Tully Silty Clay Loam, 3 To 8 Percent Slopes

Tully soil makes up 85 percent of the map unit. This map unit is in the Bluestem Hills Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping footslope hillslope on upland. The runoff class is very high. The parent material consists of clayey colluvium. This soil is well drained. The slowest permeability is slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe30-36) range site. It is in the nonirrigated land capability classification 3e.

Vc Valentine Loamy Fine Sand, 5 To 15 Percent Slopes

Valentine soil makes up 85 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep dune on upland. The runoff class is very low. The parent material consists of sandy eolian sands. This soil is excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy (pe25-34) range site. It is in the nonirrigated land capability classification 6e.

We Wells-Ortello Complex, 1 To 4 Percent Slopes

Wells soil makes up 50 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping backslope hillslope on upland. The runoff class is low. The parent material consists of fine-loamy residuum. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 3e.

Ortello soil makes up 30 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is very low. The parent material consists of loamy alluvium and/or loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy (pe25-34) range site. It is in the nonirrigated land capability classification 3e.

Wf Wells-Ortello Complex, 4 To 8 Percent Slopes

Wells soil makes up 50 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping backslope hillslope on upland. The runoff class is medium. The parent material consists of fine-loamy residuum. This soil is well drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Loamy Upland (pe25-34) range site. It is in the nonirrigated land capability classification 4e.

Ortello soil makes up 30 percent of the map unit. This map unit is in the Central Loess Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is low. The parent material consists of loamy alluvium and/or loamy eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a high available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The seasonal high water table is at a depth of more than 6 feet. This soil is in the Sandy (pe25-34) range site. It is in the nonirrigated land capability classification 4e.

Be—Benfield-Florence complex, 5 to 30 percent slopes

Map Unit Composition

Benfield: 42 percent
 Florence: 28 percent
 Minor components: 30 percent

Component Descriptions

Benfield

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Clayey pedisidiment derived from limestone and shale over clayey residuum
 weathered from calcareous shale
Slope: 5 to 30 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 5.7 inches)
Shrink-swell potential: High (About 8.9 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Loamy Upland (pe30-36)
Land capability (nonirrigated): 6e

Typical Profile:

A1—0 to 5 inches; silty clay loam
 A2—5 to 10 inches; silty clay loam
 Bt1—10 to 19 inches; gravelly silty clay
 Bt2—19 to 34 inches; silty clay
 2Btk—34 to 38 inches; silty clay
 2Cr—38 to 56 inches; weathered bedrock

Florence

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Gravelly residuum weathered from cherty limestone
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Low (About 4.6 inches)
Shrink-swell potential: Very high (About 9.2 LEP)

Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe30-36)
Land capability (nonirrigated): 6e

Typical Profile:

A1—0 to 5 inches; gravelly silt loam
 A2—5 to 14 inches; very gravelly silty clay
 Bt—14 to 48 inches; very cobbly clay
 Btk—48 to 56 inches; extremely cobbly silty clay
 R—56 to 60 inches; unweathered bedrock

Minor Components

Clime

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 20 to 40 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Konza

Composition: About 10 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Pan (pe30-36)

Labette

Composition: About 3 percent
Slope: 0 to 4 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Irwin

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-36)

Tully

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 8 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Kahola

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Rock outcrop

Composition: About 1 percent

Cc—Clime silty clay loam, 20 to 40 percent slopes, very stony

Map Unit Composition

Clime: 75 percent
 Minor components: 25 percent

Component Descriptions

Clime

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey residuum weathered from shale, calcareous
Slope: 20 to 40 percent
Surface fragments: About 0 to 3 percent angular (shape or size unspecified)
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 5.3 inches)
Shrink-swell potential: High (About 8.4 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Limy Upland (pe30-36)
Land capability (nonirrigated): 7e

Typical Profile:

A1—0 to 2 inches; silty clay loam
 A2—2 to 9 inches; silty clay
 Bw—9 to 27 inches; silty clay
 C—27 to 33 inches; silty clay
 Cr—33 to 37 inches; weathered bedrock

Minor Components**Tuttle**

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 20 to 40 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)

Drainage class: Somewhat excessively drained

Tully

Composition: About 8 percent
Geomorphic Position: hillslope on upland
Slope: 8 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Rock outcrop

Composition: About 4 percent

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Sogn

Composition: About 1 percent
Slope: 1 to 20 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Ecological site: Shallow Limy (pe30-36)

Kahola

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Cf—Clime-Sogn silty clay loams, 5 to 20 percent slopes

Map Unit Composition

Clime: 60 percent
 Sogn: 20 percent
 Minor components: 20 percent

Component Descriptions

Clime

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Parent material: Silty and clayey residuum weathered from shale, calcareous
Slope: 5 to 20 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 5.2 inches)
Shrink-swell potential: High (About 8.4 LEP)

Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Limy Upland (pe30-36)
Land capability (nonirrigated): 6e

Typical Profile:

A—0 to 12 inches; silty clay loam
 Bw—12 to 26 inches; silty clay
 C—26 to 30 inches; silty clay
 Cr—30 to 34 inches; weathered bedrock

Sogn

MLRA: 76 - Bluestem Hills
Landform: Upland, hillslope
Parent material: Loamy residuum weathered from limestone, unspecified
Slope: 1 to 20 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 2.0 inches)
Shrink-swell potential: Moderate (About 4.9 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Shallow Limy (pe30-36)
Land capability (nonirrigated): 6s

Typical Profile:

A—0 to 9 inches; silty clay loam
 R—9 to 13 inches; unweathered bedrock

Minor Components

Tully

Composition: About 12 percent
Geomorphic Position: hillslope on upland
Slope: 8 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Tuttle

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 20 to 40 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained

Irwin

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 7 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-36)

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Konza

Composition: About 1 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Pan (pe30-36)

Kahola

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Cr—Crete silty clay loam, 0 to 1 percent slopes

Map Unit Composition

Crete: 90 percent
 Minor components: 10 percent

Component Descriptions

Crete

MLRA: 75 - Central Loess Plains
Landform: Ridge on upland
Hillslope position: Shoulder, summit
Parent material: Loess
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.3 inches)
Shrink-swell potential: Very high (About 9.5 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium

Ecological site: Clay Upland (pe25-34)
Land capability (nonirrigated): 2s

Typical Profile:

Ap—0 to 6 inches; silty clay loam
 BA—6 to 14 inches; silty clay loam
 Bt—14 to 30 inches; silty clay
 Btk—30 to 42 inches; silty clay loam
 BC—42 to 60 inches; silty clay loam

Minor Components

Holder

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Hastings

Composition: About 5 percent
Geomorphic Position: divide on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe26-30)

Cs—Crete silty clay loam, 1 to 4 percent slopes

Map Unit Composition

Crete: 90 percent
 Minor components: 10 percent

Component Descriptions

Crete

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope, shoulder
Parent material: Loess
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Very high (About 9.5 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Clay Upland (pe25-34)
Land capability (nonirrigated): 2e

Typical Profile:

Ap—0 to 6 inches; silty clay loam
 BA—6 to 11 inches; silty clay loam
 Bt—11 to 27 inches; silty clay
 Btk—27 to 40 inches; silty clay loam
 BC—40 to 60 inches; silty clay loam

Minor Components

Holder

Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Hastings

Composition: About 4 percent
Geomorphic Position: divide on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe26-30)

Clime

Composition: About 2 percent
Slope: 1 to 4 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Ct—Crete silty clay loam, 3 to 8 percent slopes

Map Unit Composition

Crete: 90 percent
 Minor components: 10 percent

Component Descriptions

Crete

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Shoulder, backslope
Parent material: Loess
Slope: 3 to 8 percent
Drainage class: Moderately well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.8 inches)
Shrink-swell potential: Very high (About 9.5 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Clay Upland (pe25-34)

Land capability (nonirrigated): 3e

Typical Profile:

Ap—0 to 6 inches; silty clay loam
Bt—6 to 16 inches; silty clay
Btk—16 to 29 inches; silty clay loam
BC—29 to 46 inches; silty clay loam
C—46 to 60 inches; silt loam

Minor Components

Hastings

Composition: About 4 percent
Geomorphic Position: divide on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe26-30)

Holder

Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

**Eu—Eudora silt loam,
occasionally flooded**

Map Unit Composition

Eudora: 85 percent
Minor components: 15 percent

Component Descriptions

Eudora

MLRA: 75 - Central Loess Plains
Landform: Flood plain on river valley
Parent material: Loamy alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60
in/hr)
Available water capacity: Very high (About 12.1
inches)
Shrink-swell potential: Low (About 2.4 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6
feet

Runoff class: Low

Ecological site: Loamy Lowland (pe30-36)

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 7 inches; silt loam
A1—7 to 14 inches; silt loam
A2—14 to 19 inches; silt loam
C1—19 to 26 inches; silt loam
C2—26 to 60 inches; very fine sandy loam

Minor Components

McCook

Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe25-34)

Sarpy

Composition: About 3 percent
Slope: 0 to 4 percent
Drainage class: Excessively drained
Ecological site: Sandy Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

**Ge—Geary silt loam, 3 to 8 percent
slopes**

Map Unit Composition

Geary: 85 percent
Minor components: 15 percent

Component Descriptions

Geary

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Footslope, backslope
Parent material: Silty loess
Slope: 3 to 8 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60
in/hr)
Available water capacity: High (About 11.3
inches)

Shrink-swell potential: Moderate (About 5.6 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 3e

Typical Profile:

A1—0 to 8 inches; silt loam
 A2—8 to 18 inches; silt loam
 Bt1—18 to 25 inches; silty clay loam
 Bt2—25 to 48 inches; silty clay loam
 Bt3—48 to 60 inches; silty clay loam

Minor Components

Hastings

Composition: About 4 percent
Geomorphic Position: divide on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe26-30)

Holder

Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Crete

Composition: About 4 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Sogn

Composition: About 1 percent
Slope: 6 to 12 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)
Drainage class: Somewhat excessively drained
Ecological site: Shallow Limy (pe30-36)

Gf—Geary silt loam, 7 to 15 percent slopes

Map Unit Composition

Geary: 85 percent
 Minor components: 15 percent

Component Descriptions

Geary

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty loess
Slope: 7 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.0 inches)
Shrink-swell potential: Moderate (About 5.6 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 6e

Typical Profile:

A1—0 to 6 inches; silt loam
 A2—6 to 10 inches; silt loam
 Bt1—10 to 16 inches; silty clay loam
 Bt2—16 to 38 inches; silty clay loam
 BC—38 to 60 inches; silt loam

Minor Components

Holder

Composition: About 9 percent
Geomorphic Position: hillslope on upland
Slope: 7 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Clime

Composition: About 5 percent
Slope: 7 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Sogn

Composition: About 1 percent
Slope: 7 to 15 percent
Depth to restrictive feature: 4 to 20 inches to bedrock (lithic)

Drainage class: Somewhat excessively drained
Ecological site: Shallow Limy (pe30-36)

He—Haynie silt loam, frequently flooded

Map Unit Composition

Haynie: 55 percent
 Minor components: 45 percent

Component Descriptions

Haynie

MLRA: 75 - Central Loess Plains
Landform: Flood plain on river valley
Parent material: Coarse-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.4 inches)
Shrink-swell potential: Low (About 2.6 LEP)
Flooding hazard: Frequent
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-36)
Land capability (nonirrigated): 5w

Typical Profile:

A—0 to 10 inches; silt loam
 C—10 to 60 inches; very fine sandy loam

Minor Components

Unnamed Stratified Soils (fine-Silty)

Composition: About 33 percent
Slope: 0 to 2 percent
Drainage class: Moderately well drained

Unnamed Stratified Soils (fine)

Composition: About 9 percent
Slope: 0 to 2 percent
Drainage class: Moderately well drained

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent

Drainage class: Poorly drained

Unnamed Stratified Soils (sandy)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Excessively drained

Hf—Hobbs silt loam, channeled

Map Unit Composition

Hobbs: 89 percent
 Minor components: 11 percent

Component Descriptions

Hobbs

MLRA: 75 - Central Loess Plains
Landform: Flood plain on meander belt
Parent material: Fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Moderate (About 3.3 LEP)
Flooding hazard: Frequent
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe25-34)
Land capability (nonirrigated): 5w

Typical Profile:

A—0 to 8 inches; silt loam
 C1—8 to 24 inches; silt loam
 C2—24 to 44 inches; silt loam
 C3—44 to 60 inches; silt loam

Minor Components

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Muir

Composition: About 2 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Terrace (pe25-34)

Crete

Composition: About 1 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Geary

Composition: About 1 percent
Geomorphic Position: hillslope on upland
Slope: 7 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Hg—Hobbs silt loam, occasionally flooded

Map Unit Composition

Hobbs: 89 percent
 Minor components: 11 percent

Component Descriptions

Hobbs

MLRA: 75 - Central Loess Plains
Parent material: Fine-silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.9 inches)
Shrink-swell potential: Moderate (About 3.3 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe25-34)
Land capability (nonirrigated): 2w

Typical Profile:
 A—0 to 8 inches; silt loam
 C1—8 to 24 inches; silt loam

C2—24 to 44 inches; silt loam
 C3—44 to 60 inches; silt loam

Minor Components

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Muir

Composition: About 2 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Terrace (pe25-34)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Geary

Composition: About 1 percent
Geomorphic Position: hillslope on upland
Slope: 7 to 15 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Crete

Composition: About 1 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Hm—Holder silt loam, 1 to 3 percent slopes

Map Unit Composition

Holder: 95 percent
 Minor components: 5 percent

Component Descriptions

Holder

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty loess
Slope: 1 to 3 percent
Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Moderate (About 5.1 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 2e

Typical Profile:

A—0 to 8 inches; silt loam
 BA—8 to 14 inches; silt loam
 Bt—14 to 45 inches; silty clay loam
 BC—45 to 58 inches; silty clay loam
 Ck—58 to 60 inches; silt loam

Minor Components**Crete**

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Ho—Holder silt loam, 3 to 7 percent slopes**Map Unit Composition**

Holder: 75 percent
 Minor components: 25 percent

Component Descriptions**Holder**

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty loess
Slope: 3 to 7 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.1 inches)
Shrink-swell potential: Moderate (About 5.1 LEP)
Flooding hazard: None
Ponding hazard: None

Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 3e

Typical Profile:

A—0 to 8 inches; silt loam
 BA—8 to 14 inches; silt loam
 Bt—14 to 45 inches; silty clay loam
 BC—45 to 58 inches; silty clay loam
 Ck—58 to 60 inches; silt loam

Minor Components**Crete**

Composition: About 13 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Geary

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Id—Irwin silty clay loam, 3 to 7 percent slopes**Map Unit Composition**

Irwin: 85 percent
 Minor components: 15 percent

Component Descriptions**Irwin**

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Silty and clayey alluvium over clayey residuum weathered from limestone and shale
Slope: 3 to 7 percent
Drainage class: Moderately well drained

Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.7 inches)
Shrink-swell potential: High (About 8.9 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Clay Upland (pe30-36)
Land capability (nonirrigated): 4e

Typical Profile:

A—0 to 6 inches; silty clay loam
 BA—6 to 13 inches; silty clay loam
 Bt1—13 to 30 inches; silty clay
 Btk—30 to 41 inches; silty clay
 2Bt2—41 to 72 inches; silty clay

Minor Components

Konza

Composition: About 10 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Pan (pe30-36)

Florence

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 5 to 10 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Ka—Kahola silt loam, channeled

Map Unit Composition

Kahola: 75 percent
 Minor components: 25 percent

Component Descriptions

Kahola

MLRA: 76 - Bluestem Hills
Landform: Flood plain on meander belt
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.9 inches)
Shrink-swell potential: Moderate (About 4.0 LEP)
Flooding hazard: Frequent
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-36)
Land capability (nonirrigated): 5w

Typical Profile:

A1—0 to 24 inches; silt loam
 A2—24 to 36 inches; silt loam
 AC—36 to 44 inches; silt loam
 C—44 to 60 inches; silt loam

Minor Components

Tully

Composition: About 13 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Kb—Kahola silt loam, occasionally flooded**Map Unit Composition**

Kahola: 75 percent
 Minor components: 25 percent

Component Descriptions**Kahola**

MLRA: 76 - Bluestem Hills
Landform: Flood plain on valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.9 inches)
Shrink-swell potential: Moderate (About 4.0 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-36)
Land capability (nonirrigated): 2w

Typical Profile:

A1—0 to 24 inches; silt loam
 A2—24 to 36 inches; silt loam
 AC—36 to 44 inches; silt loam
 C—44 to 60 inches; silt loam

Minor Components**Calcareous, Fine-Loamy, Cumulic Hapludolls**

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Tully

Composition: About 8 percent
Geomorphic Position: hillslope on upland
Slope: 3 to 8 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Reading

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Ko—Konza silty clay loam, 1 to 3 percent slopes**Map Unit Composition**

Konza: 85 percent
 Minor components: 15 percent

Component Descriptions**Konza**

MLRA: 76 - Bluestem Hills
Landform: Ridge on upland
Hillslope position: Summit, shoulder
Parent material: Silty and clayey loess over silty and clayey pedisegment over clayey residuum weathered from limestone and shale
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.8 inches)
Shrink-swell potential: Very high (About 10.0 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Clay Pan (pe30-36)
Land capability (nonirrigated): 3e

Typical Profile:

A—0 to 6 inches; silty clay loam
 Bt1—6 to 28 inches; silty clay
 Bt2—28 to 42 inches; silty clay
 Bt3—42 to 50 inches; silty clay loam
 2Bt4—50 to 70 inches; silty clay loam
 3Bt5—70 to 89 inches; clay

Minor Components**Irwin**

Composition: About 5 percent
Geomorphic Position: hillslope on upland

Slope: 3 to 7 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe30-36)

Ladysmith

Composition: About 3 percent
Geomorphic Position: ridge on upland
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Upland (pe30-36)

Labette

Composition: About 3 percent
Slope: 0 to 4 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Florence

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 5 to 10 percent
Depth to restrictive feature: 40 to 60 inches
to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Lm—Ladysmith silty clay loam, 0 to 2 percent slopes**Map Unit Composition**

Ladysmith: 90 percent
 Minor components: 10 percent

Component Descriptions**Ladysmith**

MLRA: 76 - Bluestem Hills
Landform: Ridge on upland
Hillslope position: Summit, shoulder
Parent material: Clayey alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Impermeable (About 0.00 in/hr)
Available water capacity: Moderate (About 8.7 inches)
Shrink-swell potential: Very high (About 9.0 LEP)

Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet

Runoff class: Very high
Ecological site: Clay Upland (pe30-36)
Land capability (nonirrigated): 2s

Typical Profile:

A—0 to 7 inches; silty clay loam
 Bt1—7 to 15 inches; silty clay
 Bt2—15 to 30 inches; clay
 BCk—30 to 38 inches; clay
 C—38 to 60 inches; silty clay

Minor Components**Konza**

Composition: About 10 percent
Geomorphic Position: ridge on upland
Slope: 1 to 3 percent
Drainage class: Moderately well drained
Ecological site: Clay Pan (pe30-36)

Lo—Longford loam, 1 to 3 percent slopes**Map Unit Composition**

Longford: 85 percent
 Minor components: 15 percent

Component Descriptions**Longford**

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Loamy alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.6 inches)
Shrink-swell potential: High (About 6.4 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 2e

Typical Profile:

A—0 to 11 inches; loam
 BA—11 to 16 inches; clay loam
 Bt—16 to 46 inches; clay loam

BC—46 to 54 inches; clay loam
C—54 to 60 inches; loam

Minor Components

Crete

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Wells

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Ortello

Composition: About 5 percent
Slope: 1 to 4 percent
Drainage class: Well drained
Ecological site: Sandy (pe25-34)

M-W—Miscellaneous Water

Mb—McCook silt loam, occasionally flooded

Map Unit Composition

McCook: 85 percent
Minor components: 15 percent

Component Descriptions

McCook

MLRA: 75 - Central Loess Plains
Landform: Stream terrace on river valley
Parent material: Weakly stratified calcareous coarse-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Low (About 2.1 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe25-34)
Land capability (nonirrigated): 2w

Typical Profile:

A—0 to 16 inches; silt loam
AC—16 to 25 inches; silt loam
C—25 to 60 inches; very fine sandy loam

Minor Components

Eudora

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Smokyhill

Composition: About 3 percent
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Ecological site: Clay Lowland (pe30-36)

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained

Solomon

Composition: About 1 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-36)

Mc—McCook silt loam, rarely flooded

Map Unit Composition

McCook: 85 percent
Minor components: 15 percent

Component Descriptions

McCook

MLRA: 75 - Central Loess Plains
Landform: Stream terrace on river valley
Parent material: Weakly stratified calcareous coarse-silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Low (About 2.1 LEP)
Flooding hazard: Rare
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Lowland (pe25-34)

Land capability (nonirrigated): 1

Typical Profile:

A—0 to 16 inches; silt loam

AC—16 to 25 inches; silt loam

C—25 to 60 inches; very fine sandy loam

Minor Components

Eudora

Composition: About 10 percent

Slope: 0 to 2 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe30-36)

Smokyhill

Composition: About 3 percent

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Ecological site: Clay Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent

Slope: 0 to 2 percent

Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent

Slope: 0 to 2 percent

Drainage class: Poorly drained

Mk—McCook-Smokyhill silt loams, occasionally flooded

Map Unit Composition

McCook: 63 percent

Smokyhill: 25 percent

Minor components: 12 percent

Component Descriptions

McCook

MLRA: 75 - Central Loess Plains

Landform: Stream terrace on river valley

Parent material: Weakly stratified calcareous coarse-silty alluvium

Slope: 0 to 1 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.7 inches)

Shrink-swell potential: Low (About 2.1 LEP)

Flooding hazard: Occasional

Ponding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Lowland (pe25-34)

Land capability (nonirrigated): 2w

Typical Profile:

A—0 to 12 inches; silt loam

AC—12 to 23 inches; silt loam

C—23 to 60 inches; silt loam, very fine sandy loam

Smokyhill

MLRA: 75 - Central Loess Plains

Landform: Depression on flood plain on river valley

Parent material: Clayey alluvium over silty alluvium

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 10.7 inches)

Shrink-swell potential: High (About 6.8 LEP)

Flooding hazard: Occasional

Ponding hazard: Rare

Depth to seasonal water saturation: More than 6 feet

Runoff class: Negligible

Ecological site: Clay Lowland (pe30-36)

Land capability (nonirrigated): 2w

Typical Profile:

Ap—0 to 6 inches; silt loam

A—6 to 14 inches; silty clay loam

AC—14 to 30 inches; silty clay loam

2C—30 to 72 inches; silt loam

Minor Components

McCook Sandy Substratum

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Well drained

Ecological site: Loamy Lowland (pe25-34)

Sutphen

Composition: About 5 percent

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained

Ecological site: Clay Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent

Slope: 0 to 2 percent

Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent

Slope: 0 to 2 percent

Drainage class: Poorly drained

Mu—Muir silt loam, rarely flooded

Map Unit Composition

Muir: 94 percent
Minor components: 6 percent

Component Descriptions

Muir

MLRA: 75 - Central Loess Plains
Landform: Flood plain on alluvial plain
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very high (About 12.3 inches)
Shrink-swell potential: Moderate (About 3.0 LEP)
Flooding hazard: Rare
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Terrace (pe25-34)
Land capability (nonirrigated): 1

Typical Profile:

Ap—0 to 4 inches; silt loam
A—4 to 16 inches; silt loam
Bw1—16 to 24 inches; silt loam
Bw2—24 to 44 inches; silt loam
C—44 to 60 inches; silt loam

Minor Components

Sutphen

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe30-36)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Oc—Orthents

Or—Orthents, Earthen Dam

Pt—Pits, Quarries

General Considerations: Pits are open excavations from which soil and commonly underlying material have been removed, exposing either rock or other material. Kinds include Pits, mine; Pits, gravel; and Pits, quarry. Commonly, pits are closely associated with Dumps.

Ra—Reading silt loam, 0 to 1 percent slopes

Map Unit Composition

Reading: 85 percent
Minor components: 15 percent

Component Descriptions

Reading

MLRA: 76 - Bluestem Hills
Landform: Flood plain on valley
Parent material: Silty alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Moderate (About 5.1 LEP)
Flooding hazard: Rare
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-36)
Land capability (nonirrigated): 1

Typical Profile:

Ap—0 to 8 inches; silt loam
A—8 to 20 inches; silty clay loam
Bt1—20 to 52 inches; silty clay loam
Bt2—52 to 60 inches; silty clay loam

Minor Components

Tully

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent

Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Kahola

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Re—Reading silty clay loam, 0 to 2 percent slopes**Map Unit Composition**

Reading: 85 percent
 Minor components: 15 percent

Component Descriptions**Reading**

MLRA: 76 - Bluestem Hills
Landform: Flood plain on valley
Parent material: Silty alluvium
Slope: 0 to 2 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.7 inches)
Shrink-swell potential: Moderate (About 5.1 LEP)
Flooding hazard: Rare
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe30-36)
Land capability (nonirrigated): 1

Typical Profile:

Ap—0 to 8 inches; silty clay loam
 A—8 to 20 inches; silty clay loam
 Bt1—20 to 52 inches; silty clay loam
 Bt2—52 to 60 inches; silty clay loam

Minor Components**Tully**

Composition: About 10 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Kahola

Composition: About 5 percent
Slope: 0 to 2 percent

Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Sa—Sarpy loamy fine sand, 0 to 4 percent slopes**Map Unit Composition**

Sarpy: 90 percent
 Minor components: 10 percent

Component Descriptions**Sarpy**

MLRA: 75 - Central Loess Plains
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 4 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 4.5 inches)
Shrink-swell potential: Low (About 0.0 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sandy Lowland (pe30-36)
Land capability (nonirrigated): 4s

Typical Profile:

Ap—0 to 9 inches; loamy fine sand
 C—9 to 60 inches; fine sand

Minor Components**Eudora**

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Sc—Sarpy gravelly loamy sand, 0 to 4 percent slopes, occasionally flooded**Map Unit Composition**

Sarpy: 90 percent
 Minor components: 10 percent

Component Descriptions

Sarpy

MLRA: 75 - Central Loess Plains
Landform: Flood plain on river valley
Parent material: Sandy alluvium
Slope: 0 to 4 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Very low (About 2.1 inches)
Shrink-swell potential: Low (About 0.0 LEP)
Flooding hazard: Occasional
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sandy Lowland (pe30-36)
Land capability (nonirrigated): 6s

Typical Profile:

A—0 to 4 inches; gravelly loamy coarse sand
 C1—4 to 10 inches; sand
 C2—10 to 60 inches; coarse sand

Minor Components**Eudora**

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Sh—Solomon silty clay, occasionally flooded**Map Unit Composition**

Solomon: 85 percent
 Minor components: 15 percent

Component Descriptions**Solomon**

MLRA: 75 - Central Loess Plains
Landform: Ephemeral oxbow lake on flood plain on river valley
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 6.5 inches)
Shrink-swell potential: Very high (About 10.4 LEP)
Flooding hazard: Occasional

Ponding hazard: Frequent

Depth to seasonal water saturation: More than 6 feet

Runoff class: Negligible

Ecological site: Clay Lowland (pe30-36)

Land capability (nonirrigated): 3w

Typical Profile:

Ap—0 to 8 inches; silty clay
 A—8 to 19 inches; silty clay
 Bg1—19 to 36 inches; clay
 Bg2—36 to 50 inches; clay
 Bg3—50 to 60 inches; clay

Minor Components**Sutphen**

Composition: About 10 percent
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Ecological site: Clay Lowland (pe30-36)

McCook

Composition: About 5 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe25-34)

St—Sutphen silty clay, occasionally flooded**Map Unit Composition**

Sutphen: 80 percent
 Minor components: 20 percent

Component Descriptions**Sutphen**

MLRA: 75 - Central Loess Plains
Landform: Flood plain on river valley
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 7.9 inches)
Shrink-swell potential: Very high (About 9.7 LEP)
Flooding hazard: Occasional
Ponding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Clay Lowland (pe30-36)
Land capability (nonirrigated): 3w

Typical Profile:

Ap—0 to 6 inches; silty clay
 A1—6 to 11 inches; silty clay
 A2—11 to 21 inches; silty clay
 AC—21 to 30 inches; silty clay
 C1—30 to 40 inches; silty clay
 C2—40 to 60 inches; silty clay

Minor Components**Muir**

Composition: About 10 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Terrace (pe25-34)

McCook

Composition: About 8 percent
Slope: 0 to 1 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe25-34)

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Solomon

Composition: About 1 percent
Slope: 0 to 1 percent
Drainage class: Poorly drained
Ecological site: Clay Lowland (pe30-36)

Tn—Tully silty clay loam, 1 to 4 percent slopes**Map Unit Composition**

Tully: 85 percent
 Minor components: 15 percent

Component Descriptions**Tully**

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Footslope
Parent material: Clayey colluvium
Slope: 1 to 4 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.1 inches)
Shrink-swell potential: High (About 8.0 LEP)
Flooding hazard: None
Ponding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe30-36)

Land capability (nonirrigated): 2e

Typical Profile:

A—0 to 12 inches; silty clay loam
 BA—12 to 21 inches; silty clay loam
 Bt1—21 to 31 inches; silty clay
 Bt2—31 to 40 inches; silty clay
 Bt3—40 to 52 inches; silty clay
 BC—52 to 60 inches; silty clay

Minor Components**Kahola**

Composition: About 6 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Reading

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Florence

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 5 to 8 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Clime

Composition: About 2 percent
Slope: 1 to 4 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

To—Tully silty clay loam, 3 to 8 percent slopes**Map Unit Composition**

Tully: 85 percent
 Minor components: 15 percent

Component Descriptions**Tully**

MLRA: 76 - Bluestem Hills
Landform: Hillslope on upland
Hillslope position: Footslope

Parent material: Clayey colluvium
Slope: 3 to 8 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.1 inches)
Shrink-swell potential: High (About 8.0 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Loamy Upland (pe30-36)
Land capability (nonirrigated): 3e

Typical Profile:

A—0 to 12 inches; silty clay loam
 BA—12 to 21 inches; silty clay loam
 Bt1—21 to 31 inches; silty clay
 Bt2—31 to 40 inches; silty clay
 Bt3—40 to 52 inches; silty clay
 BC—52 to 60 inches; silty clay

Minor Components

Kahola

Composition: About 5 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Reading

Composition: About 3 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Benfield

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 5 to 15 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Florence

Composition: About 2 percent
Geomorphic Position: hillslope on upland
Slope: 5 to 15 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (lithic)
Drainage class: Well drained
Ecological site: Loamy Upland (pe30-36)

Clime

Composition: About 2 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Calcareous, Fine-Loamy, Cumulic Hapludolls

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Well drained
Ecological site: Loamy Lowland (pe30-36)

Vc—Valentine loamy fine sand, 5 to 15 percent slopes

Map Unit Composition

Valentine: 85 percent
 Minor components: 15 percent

Component Descriptions

Valentine

MLRA: 75 - Central Loess Plains
Landform: Dune on upland
Parent material: Sandy eolian sands
Slope: 5 to 15 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 5.6 inches)
Shrink-swell potential: Low (About 0.0 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe25-34)
Land capability (nonirrigated): 6e

Typical Profile:

A—0 to 5 inches; loamy fine sand
 C1—5 to 50 inches; loamy sand
 C2—50 to 60 inches; sand

Minor Components

Ortello

Composition: About 5 percent
Slope: 1 to 4 percent
Drainage class: Well drained
Ecological site: Sandy (pe25-34)

Wells

Composition: About 5 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Longford

Composition: About 2 percent
Geomorphic Position: hillslope on upland

Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Unnamed Hydric Soil (ponding)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Unnamed Hydric Soil (saturation)

Composition: About 1 percent
Slope: 0 to 2 percent
Drainage class: Poorly drained

Clime

Composition: About 1 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

W—Water

We—Wells-Ortello complex, 1 to 4 percent slopes

Map Unit Composition

Wells: 50 percent
Ortello: 30 percent
Minor components: 15 percent

Component Descriptions

Wells

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Fine-loamy residuum
Slope: 1 to 4 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.4 inches)
Shrink-swell potential: Moderate (About 4.9 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 3e

Typical Profile:

A—0 to 12 inches; loam
BA—12 to 19 inches; clay loam
Bt1—19 to 37 inches; clay loam
Bt2—37 to 51 inches; sandy clay loam
BC—51 to 63 inches; clay loam

Ortello

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Parent material: Loamy alluvium and/or loamy eolian deposits
Slope: 1 to 4 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: High (About 9.0 inches)
Shrink-swell potential: Low (About 0.5 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Sandy (pe25-34)
Land capability (nonirrigated): 3e

Typical Profile:

Ap—0 to 6 inches; sandy loam
A—6 to 15 inches; sandy loam
Bw—15 to 34 inches; sandy loam
C—34 to 60 inches; sandy loam

Minor Components

Longford

Composition: About 12 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Clime

Composition: About 1 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches
to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

Valentine

Composition: About 1 percent
Slope: 5 to 15 percent
Drainage class: Excessively drained
Ecological site: Sandy (pe25-34)

Crete

Composition: About 1 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 4 percent
Drainage class: Moderately well drained
Ecological site: Clay Upland (pe25-34)

Wf—Wells-Ortello complex, 4 to 8 percent slopes

Map Unit Composition

Wells: 50 percent
Ortello: 30 percent
Minor components: 15 percent

Component Descriptions

Wells

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Hillslope position: Backslope
Parent material: Fine-loamy residuum
Slope: 4 to 8 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.4 inches)
Shrink-swell potential: Moderate (About 4.9 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe25-34)
Land capability (nonirrigated): 4e

Typical Profile:

A—0 to 12 inches; loam
BA—12 to 19 inches; clay loam
Bt1—19 to 37 inches; clay loam
Bt2—37 to 51 inches; sandy clay loam
BC—51 to 63 inches; clay loam

Ortello

MLRA: 75 - Central Loess Plains
Landform: Hillslope on upland
Parent material: Loamy alluvium and/or loamy eolian deposits
Slope: 4 to 8 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: High (About 9.0 inches)
Shrink-swell potential: Low (About 0.5 LEP)
Flooding hazard: None
Ponding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe25-34)
Land capability (nonirrigated): 4e

Typical Profile:

Ap—0 to 6 inches; sandy loam
A—6 to 15 inches; sandy loam
Bw—15 to 34 inches; sandy loam
C—34 to 60 inches; sandy loam

Minor Components

Longford

Composition: About 14 percent
Geomorphic Position: hillslope on upland
Slope: 1 to 3 percent
Drainage class: Well drained
Ecological site: Loamy Upland (pe25-34)

Clime

Composition: About 1 percent
Slope: 3 to 8 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Ecological site: Limy Upland (pe30-36)

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

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

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

The map units in the survey area that are considered prime farmland are listed in the following table. This list does not constitute a recommendation for a particular land use. On some soils included in the list, measures that overcome a hazard or limitation, such as flooding, wetness, and droughtiness, are needed. Onsite evaluation is needed to determine whether or not the hazard or limitation has been overcome by corrective measures. The extent of each listed map unit is shown in the "Acres and Proportionate Extent of Soils" table. The location is shown on the detailed soil maps. The soil qualities that affect use and management are described in other tables in this document."

Map symbol	Mapunit name	Farmland Classification
Cr	Crete silty clay loam, 0 to 1 percent slopes	All areas are prime farmland
Cs	Crete silty clay loam, 1 to 4 percent slopes	All areas are prime farmland
Eu	Eudora silt loam, occasionally flooded	All areas are prime farmland
Hg	Hobbs silt loam, occasionally flooded	All areas are prime farmland
Hm	Holder silt loam, 1 to 3 percent slopes	All areas are prime farmland
Ho	Holder silt loam, 3 to 7 percent slopes	All areas are prime farmland
Kb	Kahola silt loam, occasionally flooded	All areas are prime farmland
Ko	Konza silty clay loam, 1 to 3 percent slopes	All areas are prime farmland
Lm	Ladysmith silty clay loam, 0 to 2 percent slopes	All areas are prime farmland
Lo	Longford loam, 1 to 3 percent slopes	All areas are prime farmland
Mb	Mccook silt loam, occasionally flooded	All areas are prime farmland
Mc	Mccook silt loam, rarely flooded	All areas are prime farmland
Mk	Mccook-smokyhill silt loams, occasionally flooded	All areas are prime farmland
Mu	Muir silt loam, rarely flooded	All areas are prime farmland
Ra	Reading silt loam, 0 to 1 percent slopes	All areas are prime farmland
Re	Reading silty clay loam, 0 to 2 percent slopes	All areas are prime farmland
St	Sutphen silty clay, occasionally flooded	All areas are prime farmland
Tn	Tully silty clay loam, 1 to 4 percent slopes	All areas are prime farmland
We	Wells-ortello complex, 1 to 4 percent slopes	All areas are prime farmland
Sh	Solomon silty clay, occasionally flooded	Prime farmland if drained

SOIL RATING FOR PLANT GROWTH, modified 1998
Geary County, Kansas

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The "Soil Rating for Plant Growth, modified 1998" (SRPG) is a relative rating of the capacity of a soil to produce a specific plant under a defined management system. The index is determined from yield data on a few benchmark soils and is used to calculate yields, the net returns from crops, land assessment values, and taxes and to perform risk analysis when land management decisions are made. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

Map symbol	Soil name	Crop Index
Be	Benfield-Florence Complex, 5 To 30 Percent Slopes-----	36
Cc	Clime Silty Clay Loam, 20 To 40 Percent Slopes, Very Stony-----	6
Cf	Clime-Sogn Silty Clay Loams, 5 To 20 Percent Slopes-----	25
Cr	Crete Silty Clay Loam, 0 To 1 Percent Slopes-----	73
Cs	Crete Silty Clay Loam, 1 To 4 Percent Slopes-----	69
Ct	Crete Silty Clay Loam, 3 To 8 Percent Slopes-----	70
Eu	Eudora Silt Loam, Occasionally Flooded-----	69
Ge	Geary Silt Loam, 3 To 8 Percent Slopes-----	73
Gf	Geary Silt Loam, 7 To 15 Percent Slopes-----	64
He	Haynie Silt Loam, Frequently Flooded-----	45
Hf	Hobbs Silt Loam, Channeled-----	58
Hg	Hobbs Silt Loam, Occasionally Flooded-----	72
Hm	Holder Silt Loam, 1 To 3 Percent Slopes-----	75
Ho	Holder Silt Loam, 3 To 7 Percent Slopes-----	72
Id	Irwin Silty Clay Loam, 3 To 7 Percent Slopes-----	52
Ka	Kahola Silt Loam, Channeled-----	59
Kb	Kahola Silt Loam, Occasionally Flooded-----	74
Ko	Konza Silty Clay Loam, 1 To 3 Percent Slopes-----	52
Lm	Ladysmith Silty Clay Loam, 0 To 2 Percent Slopes-----	67
Lo	Longford Loam, 1 To 3 Percent Slopes-----	76
M-W	Miscellaneous Water-----	0
Mb	Mccook Silt Loam, Occasionally Flooded-----	63
Mc	Mccook Silt Loam, Rarely Flooded-----	64
Mk	Mccook-Smokyhill Silt Loams, Occasionally Flooded-----	62
Mu	Muir Silt Loam, Rarely Flooded-----	75
Oc	Orthents-----	39
Or	Orthents, Earthen Dam-----	7
Pt	Pits, Quarries-----	0
Ra	Reading Silt Loam, 0 To 1 Percent Slopes-----	78
Re	Reading Silty Clay Loam, 0 To 2 Percent Slopes-----	79
Sa	Sarpy Loamy Fine Sand, 0 To 4 Percent Slopes-----	32
Sc	Sarpy Gravelly Loamy Sand, 0 To 4 Percent Slopes, Occasionally Flooded---	24
Sh	Solomon Silty Clay, Occasionally Flooded-----	41
St	Sutphen Silty Clay, Occasionally Flooded-----	56
Tn	Tully Silty Clay Loam, 1 To 4 Percent Slopes-----	71
To	Tully Silty Clay Loam, 3 To 8 Percent Slopes-----	67
Vc	Valentine Loamy Fine Sand, 5 To 15 Percent Slopes-----	36
W	Water-----	0
We	Wells-Ortello Complex, 1 To 4 Percent Slopes-----	73
Wf	Wells-Ortello Complex, 4 To 8 Percent Slopes-----	71

Geary County, Kansas: Update
Field Office Thunderbook: Soils Properties for Conservation Planning

(Entries under "Erosion factors--T" apply to the entire profile. Entries under "K", "Kf", "Wind Erodibility Group" and "Wind Erodibility Index" apply only to the surface layer)

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
Be:BENFIELD-----	42	N/A	6e	Not prime farmland	C	Loamy Upland (pe30-36)	8	.37	.37	3	7	38
Be:FLORENCE-----	28	N/A	6e	Not prime farmland	C	Loamy Upland (pe30-36)	9	.15	.24	3	8	0
Cc:CLIME-----	75	N/A	7e	Not prime farmland	C	Limy Upland (pe30-36)	9	.24	.32	3	8	0
Cf:CLIME-----	60	N/A	6e	Not prime farmland	C	Limy Upland (pe30-36)	4	.24	.32	3	4	86
Cf:SOGN-----	20	N/A	6s	Not prime farmland	D	Shallow Limy (pe30-36)	5	.24	.32	1	4L	86
Cr:CRETE-----	90	N/A	2s	All areas are prime farmland	C	Clay Upland (pe25-34)	8	.37	.37	5	7	38
Cs:CRETE-----	90	N/A	2e	All areas are prime farmland	C	Clay Upland (pe25-34)	8	.37	.37	5	7	38
Ct:CRETE-----	90	N/A	3e	Not prime farmland	C	Clay Upland (pe25-34)	8	.37	.37	5	7	38
Eu:EUDORA-----	85	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe30-36)	6	.32	.32	5	5	56
Ge:GEARY-----	85	N/A	3e	Not prime farmland	B	Loamy Upland (pe25-34)	7	.32	.32	5	6	48
Gf:GEARY-----	85	N/A	6e	Not prime farmland	B	Loamy Upland (pe25-34)	7	.32	.32	5	6	48
He:HAYNIE-----	55	N/A	5w	Not prime farmland	B	Loamy Lowland (pe30-36)	5	.32	.32	5	4L	86
Hf:HOBBS-----	89	N/A	5w	Not prime farmland	B	Loamy Lowland (pe25-34)	7	.32	.32	5	6	48
Hg:HOBBS-----	89	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe25-34)	7	.32	.32	5	6	48
Hm:HOLDER-----	95	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe25-34)	7	.32	.32	5	6	48
Ho:HOLDER-----	75	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe25-34)	7	.32	.32	5	6	48
Id:IRWIN-----	85	N/A	4e	Not prime farmland	D	Clay Upland (pe30-36)	8	.37	.37	5	7	38
Ka:KAHOLA-----	75	N/A	5w	Not prime farmland	B	Loamy Lowland (pe30-36)	7	.32	.32	5	6	48

Geary County, Kansas: Update
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
Kb:KAHOLA-----	75	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe30-36)	7	.32	.32	5	6	48
Ko:KONZA-----	85	N/A	3e	All areas are prime farmland	D	Clay Pan (pe30- 36)	8	.37	.37	3	7	38
Lm:LADYSMITH----	90	N/A	2s	All areas are prime farmland	D	Clay Upland (pe30-36)	8	.37	.37	5	7	38
Lo:LONGFORD-----	85	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe25-34)	7	.28	.28	5	6	48
M- W:MISCELLANEOUS WATER-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Mb:MCCOOK-----	85	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe25-34)	5	.32	.32	5	4L	86
Mc:MCCOOK-----	85	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe25-34)	5	.32	.32	5	4L	86
Mk:MCCOOK-----	63	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe25-34)	5	.32	.32	5	4L	86
Mk:SMOKYHILL----	25	N/A	2w	All areas are prime farmland	C	Clay Lowland (pe30-36)	5	.32	.32	5	4L	86
Mu:MUIR-----	94	N/A	1	All areas are prime farmland	B	Loamy Terrace (pe25-34)	7	.32	.32	5	6	48
Oc:ORTHENTS-----	100	N/A	7s	Not prime farmland	D	Unspecified	4	---	---	5	4	86
Or:ORTHENTS, EARTHEN DAM----	100	N/A	8s			Unspecified		---	---	-	---	---
Pt:Pits, quarries-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	0
Ra:READING-----	85	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-36)	7	.32	.32	5	6	48
Re:READING-----	85	N/A	1	All areas are prime farmland	B	Loamy Lowland (pe30-36)	8	.32	.32	5	7	38
Sa:SARPY-----	90	N/A	4s	Not prime farmland	A	Sandy Lowland (pe30-36)	2	.17	.17	5	2	134
Sc:SARPY-----	90	N/A	6s	Not prime farmland	A	Sandy Lowland (pe30-36)	2	.17	.24	5	2	134
Sh:SOLOMON-----	85	N/A	3w	Prime farmland if drained	D	Clay Lowland (pe30-36)	5	.28	.28	5	4L	86

Geary County, Kansas: Update
Field Office Thunderbook: Soils Properties for Conservation Planning--Continued

Map symbol and soil name	Percent	Irr Cap Class	Nonirr Cap Class	Prime Farmland	Hydro- logic Group	Range site name	Windbreak suitability group	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
								K	Kf	T		
St:SUTPHEN-----	80	N/A	3w	All areas are prime farmland	D	Clay Lowland (pe30-36)	4	.28	.28	5	4	86
Tn:TULLY-----	85	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe30-36)	8	.37	.37	5	7	38
To:TULLY-----	85	N/A	3e	Not prime farmland	C	Loamy Upland (pe30-36)	8	.37	.37	5	7	38
Vc:VALENTINE----	85	N/A	6e	Not prime farmland	A	Sandy (pe25-34)	2	.17	.17	5	2	134
W:WATER-----	100	N/A	N/A			Unspecified		---	---	-	---	---
We:WELLS-----	50	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe25-34)	7	.28	.28	5	6	48
We:ORTELLO-----	30	N/A	3e	All areas are prime farmland	B	Sandy (pe25-34)	3	.20	.20	4	3	86
Wf:WELLS-----	50	N/A	4e	Not prime farmland	B	Loamy Upland (pe25-34)	7	.28	.28	5	6	48
Wf:ORTELLO-----	30	N/A	4e	Not prime farmland	B	Sandy (pe25-34)	3	.20	.20	4	3	86

RANGELAND PRODUCTIVITY Geary County, Kansas

Use and Explanation of Rangeland, Grazed Forest Land, Native Pastureland Interpretations

Information in this subsection can be used to plan the use and management of soils for rangeland, grazed forest land, and native pasture. Different kinds of soils vary in their capacity to produce native grasses and other plants suitable for grazing. Information in this subsection provides groupings of similar soils and estimates of potential forage production, which can be used to determine livestock stocking rates.

Rangeland. Range is land on which the native vegetation (climax or natural potential plant community) is predominantly grasses, grasslike plants, forbs, and shrubs suitable for grazing and browsing. Range includes natural grasslands, savannas, many wetlands, some deserts, tundra, and certain shrub and forb communities. Rangeland receives no regular or frequent cultural treatment. The composition and production of the plant community are determined by soil, climate, topography, overstory canopy, and grazing management.

Grazed Forest Land. Includes land on which the understory includes, as an integral part of the forest plant community, plants that can be grazed without significantly impairing other forest values.

Native Pasture. Includes land on which the native vegetation (climax or natural potential plant community) is forest but which is used and managed primarily for production of native plants for forage. Native pasture includes cut-over forest land and forest land cleared and now managed for native or naturalized forage plants.

Rangeland

In areas that have similar climate and topography, differences in the kind and amount of vegetation produced on rangeland are closely related to the kind of soil. Effective management based on the relationship between the soils and vegetation and water.

The Rangeland, Grazed Forest land, Native Pastureland Interpretations shows, for each soil that supports rangeland vegetation, the ecological site and the potential annual production of vegetation in favorable, normal, unfavorable years. An explanation of the column headings in this table follows.

An ecological site is the product of all the environmental factors responsible for its development. It has characteristic soils that have developed over time throughout the soil development process; a characteristic hydrology, particularly infiltration and runoff, that has developed over time; and a characteristic plant community (kind and amount of vegetation). The hydrology of a site is influenced by development of the soil and plant community. The vegetation, soils, and hydrology are all interrelated. Each is influenced by the others and influences the development of the others. The plant community on an ecological site is typified by an association of species that differs from that of other ecological sites in the kind and/or proportion of species or in total production. Descriptions of ecological sites are provided in the Field Office Technical Guide, which is available in local offices of the Natural Resources Conservation Service.

Total dry-weight production is the amount of vegetation that can be expected to grow annually on well managed rangeland that is supporting the potential natural plant community. It includes all vegetation, whether or not it is palatable to grazing animals. It includes the current year's growth of leaves, twigs, and fruits of woody plants. It does not include the increase in stem diameter of trees and shrubs. It is expressed in pounds per acre of air-dry vegetation for favorable, average, and unfavorable years. In a favorable year, the amount and distribution of precipitation and the temperatures make growing conditions substantially better than average. In a normal year, growing conditions are about average. In an unfavorable year, growing conditions are well below average, generally because of low available soil moisture. Yields are adjusted to a common percent of air-dry moisture content.

Range management requires a knowledge of the kinds of soil and of the potential natural plant community. It also requires an evaluation of the present range similarity index and rangeland trend. Range similarity index is determined by comparing the present plant community with the potential natural plant community on a particular rangeland ecological site. The more closely the existing community resembles the potential community, the higher the range similarity index. Rangeland trend is defined as the direction of change in an existing plant community relative to the potential natural plant community. Further information about the range similarity index and rangeland trend is available in chapter 4 of the National Range and Pasture Handbook, which is available in local offices of the Natural Resources Conservation Service. The objective in range management is to control grazing so that the plants growing on a site are about the same in kind and amount as the potential natural plant community for that site. Such management generally results in the optimum production of vegetation, control of undesirable brush species, conservation of water, and control of erosion. Sometimes, however, an area with a range similarity index somewhat below the potential meets grazing needs, provides wildlife habitat, and protects soil and water resources.

RANGELAND PRODUCTIVITY--Continued

Geary County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre
Be:				
Benfield-----	Loamy Upland (pe30-36)	6,000	4,500	3,000
Florence-----	Loamy Upland (pe30-36)	5,500	4,500	3,500
Cc:				
Cline-----	Limy Upland (pe30-36)	5,000	3,500	2,500
Cf:				
Cline-----	Limy Upland (pe30-36)	5,000	3,500	2,500
Sogn-----	Shallow Limy (pe30-36)	3,500	2,500	1,500
Cr:				
Crete-----	Clay Upland (pe25-34)	4,500	4,100	3,700
Cs:				
Crete-----	Clay Upland (pe25-34)	4,500	4,100	3,700
Ct:				
Crete-----	Clay Upland (pe25-34)	4,500	4,100	3,700
Eu:				
Eudora-----	Loamy Lowland (pe30-36)	10,000	8,000	6,000
Ge:				
Geary-----	Loamy Upland (pe25-34)	6,000	4,000	3,000
Gf:				
Geary-----	Loamy Upland (pe25-34)	6,000	4,000	3,000
He:				
Haynie-----	Loamy Lowland (pe30-36)	5,300	4,900	4,500
Hf:				
Hobbs-----	Loamy Lowland (pe25-34)	4,700	4,200	4,000
Hg:				
Hobbs-----	Loamy Lowland (pe25-34)	4,700	4,200	4,000
Hm:				
Holder-----	Loamy Upland (pe25-34)	4,800	4,400	4,000
Ho:				
Holder-----	Loamy Upland (pe25-34)	4,800	4,400	4,000
Id:				
Irwin-----	Clay Upland (pe30-36)	5,000	3,500	2,000
Ka:				
Kahola-----	Loamy Lowland (pe30-36)	10,000	8,000	6,000
Kb:				
Kahola-----	Loamy Lowland (pe30-36)	10,000	8,000	6,000
Ko:				
Konza-----	Clay Pan (pe30-36)	4,000	3,000	2,000
Lm:				
Ladysmith-----	Clay Upland (pe30-36)	5,000	3,500	2,000
Lo:				
Longford-----	Loamy Upland (pe25-34)	5,500	4,000	3,000
M-W:				
Miscellaneous Water-----	---	---	---	---
Mb:				
Mccook-----	Loamy Lowland (pe25-34)	3,800	3,300	2,800
Mc:				
Mccook-----	Loamy Lowland (pe25-34)	3,800	3,300	2,800
Mk:				
Mccook-----	Loamy Lowland (pe25-34)	3,800	3,300	2,800
Smokyhill-----	Clay Lowland (pe30-36)	7,500	5,500	3,500
Mu:				
Muir-----	Loamy Terrace (pe25-34)	7,500	5,500	4,000
Oc:				
Orthents-----	---	---	---	---
Or:				
Orthents, Earthen Dam-----	---	---	---	---
Pt:				
Pits, Quarries-----	---	---	---	---
Ra:				
Reading-----	Loamy Lowland (pe30-36)	10,000	8,000	6,000
Re:				
Reading-----	Loamy Lowland (pe30-36)	10,000	8,000	6,000
Sa:				
Sarpy-----	Sandy Lowland (pe30-36)	3,800	3,500	3,000
Sc:				
Sarpy-----	Sandy Lowland (pe30-36)	3,800	3,500	3,000
Sh:				
Solomon-----	Clay Lowland (pe30-36)	8,500	6,000	3,500
St:				
Sutphen-----	Clay Lowland (pe30-36)	7,500	5,500	3,500
Tn:				
Tully-----	Loamy Upland (pe30-36)	6,000	5,000	3,500
To:				
Tully-----	Loamy Upland (pe30-36)	6,000	5,000	3,500
Vc:				
Valentine-----	Sandy (pe25-34)	3,000	2,600	2,200
W:				
Water-----	---	---	---	---
We:				
Wells-----	Loamy Upland (pe25-34)	5,500	4,000	3,000
Ortello-----	Sandy (pe25-34)	3,500	3,300	3,000
Wf:				
Wells-----	Loamy Upland (pe25-34)	5,500	4,000	3,000
Ortello-----	Sandy (pe25-34)	3,500	3,300	3,000

RANGELAND PRODUCTIVITY--Continued

Geary County, Kansas

(Only the soils that support rangeland vegetation suitable for grazing are rated.) Refer to range site description to determine the percentage allowable of grasses, forbs, and shrubs for the range ecological site.

Map symbol and soil name	Ecological site	Total dry-weight production		
		Favorable year	Average year	Unfavorable year
		Lb/acre	Lb/acre	Lb/acre

BUILDING SITE DEVELOPMENT
Geary County, Kansas

Building Site Development

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

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

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

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

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

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

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

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

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Shrink-swell Slope	1.00 1.00	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 1.00 0.01	Very limited Shrink-swell Slope	1.00 1.00
Florence-----	28	Very limited Shrink-swell Slope	1.00 0.16	Very limited Shrink-swell Slope Depth to hard bedrock	1.00 0.16 0.05	Very limited Shrink-swell Slope	1.00 1.00
Cc: Clime-----	75	Very limited Slope Shrink-swell	1.00 1.00	Very limited Slope Shrink-swell Depth to soft bedrock	1.00 1.00 0.20	Very limited Slope Shrink-swell	1.00 1.00
Cf: Clime-----	60	Very limited Shrink-swell Slope	1.00 0.84	Very limited Shrink-swell Slope Depth to soft bedrock	1.00 0.84 0.46	Very limited Shrink-swell Slope	1.00 1.00
Sogn-----	20	Very limited Depth to hard bedrock Shrink-swell	1.00 0.73	Very limited Depth to hard bedrock Shrink-swell	1.00 0.73	Very limited Depth to hard bedrock Shrink-swell Slope	1.00 0.73 0.12
Cr: Crete-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Cs: Crete-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Ct: Crete-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.48
Eu: Eudora-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Ge: Geary-----	85	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell Slope	0.82 0.48
Gf: Geary-----	85	Somewhat limited Shrink-swell Slope	0.82 0.37	Somewhat limited Shrink-swell Slope	0.82 0.37	Very limited Slope Shrink-swell	1.00 0.82
He: Haynie-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Hf: Hobbs-----	89	Very limited Flooding Shrink-swell	1.00 0.02	Very limited Flooding Shrink-swell	1.00 0.02	Very limited Flooding Shrink-swell	1.00 0.02
Hg: Hobbs-----	89	Very limited Flooding Shrink-swell	1.00 0.02	Very limited Flooding Shrink-swell	1.00 0.02	Very limited Flooding Shrink-swell	1.00 0.02
Hm: Holder-----	95	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell	0.82
Ho: Holder-----	75	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell	0.82	Somewhat limited Shrink-swell Slope	0.82 0.12
Id: Irwin-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.12
Ka: Kahola-----	75	Very limited Flooding Shrink-swell	1.00 0.00	Very limited Flooding Shrink-swell	1.00 0.22	Very limited Flooding Shrink-swell	1.00 0.00

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Kb: Kahola-----	75	Very limited Flooding Shrink-swell	1.00 0.00	Very limited Flooding Shrink-swell	1.00 0.22	Very limited Flooding Shrink-swell	1.00 0.00
Ko: Konza-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Lm: Ladysmith-----	90	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Lo: Longford-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Mc: Mccook-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Mk: Mccook-----	63	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Smokyhill-----	25	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00	Very limited Flooding Ponding	1.00 1.00	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00
Mu: Muir-----	94	Very limited Flooding Shrink-swell	1.00 0.00	Very limited Flooding	1.00	Very limited Flooding Shrink-swell	1.00 0.00
Oc: Orthents-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Very limited Flooding Shrink-swell	1.00 0.82	Very limited Flooding Shrink-swell	1.00 0.82	Very limited Flooding Shrink-swell	1.00 0.82
Re: Reading-----	85	Very limited Flooding Shrink-swell	1.00 0.82	Very limited Flooding Shrink-swell	1.00 0.82	Very limited Flooding Shrink-swell	1.00 0.82
Sa: Sarpy-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Sc: Sarpy-----	90	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Sh: Solomon-----	85	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00
St: Sutphen-----	80	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00	Very limited Flooding Shrink-swell Ponding	1.00 1.00 1.00
Tn: Tully-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
To: Tully-----	85	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.48
Vc: Valentine-----	85	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Dwellings without basements		Dwellings with basements		Small commercial buildings	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Somewhat limited Shrink-swell	0.73	Somewhat limited Shrink-swell	0.73	Somewhat limited Shrink-swell	0.73
Ortello-----	30	Not limited		Not limited		Not limited	
Wf: Wells-----	50	Somewhat limited Shrink-swell	0.73	Somewhat limited Shrink-swell	0.73	Somewhat limited Shrink-swell Slope	0.73 0.48
Ortello-----	30	Not limited		Not limited		Somewhat limited Slope	0.48

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Low strength Shrink-swell Slope	1.00 1.00 1.00	Very limited Slope Too clayey Cutbanks cave Depth to soft bedrock	1.00 0.50 0.10 0.01	Very limited Slope Depth to bedrock	1.00 0.01
Florence-----	28	Very limited Shrink-swell Low strength Slope	1.00 1.00 0.16	Very limited Too clayey Slope Cutbanks cave Depth to hard bedrock	1.00 0.16 0.10 0.05	Somewhat limited Gravel content Droughty Slope Content of large stones	0.54 0.22 0.16 0.00
Cc: Clime-----	75	Very limited Slope Low strength Shrink-swell	1.00 1.00 1.00	Very limited Slope Too clayey Depth to soft bedrock Cutbanks cave	1.00 0.28 0.20 0.10	Very limited Slope Depth to bedrock Content of large stones	1.00 0.20 0.03
Cf: Clime-----	60	Very limited Low strength Shrink-swell Slope	1.00 1.00 0.84	Somewhat limited Slope Depth to soft bedrock Too clayey Cutbanks cave	0.84 0.46 0.28 0.10	Somewhat limited Slope Depth to bedrock	0.84 0.46
Sogn-----	20	Very limited Depth to hard bedrock Low strength Shrink-swell Frost action	1.00 1.00 0.73 0.50	Very limited Depth to hard bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty Content of large stones	1.00 1.00 0.00
Cr: Crete-----	90	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Cs: Crete-----	90	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Ct: Crete-----	90	Very limited Low strength Shrink-swell	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Eu: Eudora-----	85	Very limited Frost action Flooding	1.00 1.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Ge: Geary-----	85	Very limited Low strength Shrink-swell Frost action	1.00 0.82 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Gf: Geary-----	85	Very limited Low strength Shrink-swell Frost action Slope	1.00 0.82 0.50 0.37	Somewhat limited Slope Cutbanks cave	0.37 0.10	Somewhat limited Slope	0.37
He: Haynie-----	55	Very limited Frost action Flooding Low strength	1.00 1.00 0.22	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
Hf: Hobbs-----	89	Very limited Flooding Low strength Frost action Shrink-swell	1.00 1.00 0.50 0.02	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
Hg: Hobbs-----	89	Very limited Flooding Low strength Frost action Shrink-swell	1.00 1.00 0.50 0.02	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Hm: Holder-----	95	Very limited Low strength Shrink-swell Frost action	1.00 0.82 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ho: Holder-----	75	Very limited Low strength Shrink-swell Frost action	1.00 0.82 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Id: Irwin-----	85	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Ka: Kahola-----	75	Very limited Flooding Low strength Frost action Shrink-swell	1.00 1.00 0.50 0.00	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
Kb: Kahola-----	75	Very limited Flooding Low strength Frost action Shrink-swell	1.00 1.00 0.50 0.00	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Ko: Konza-----	85	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Lm: Ladysmith-----	90	Very limited Shrink-swell Low strength Frost action	1.00 1.00 0.50	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Lo: Longford-----	85	Very limited Low strength Shrink-swell Frost action	1.00 1.00 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Very limited Flooding Frost action	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Mc: Mccook-----	85	Somewhat limited Frost action Flooding	0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Mk: Mccook-----	63	Very limited Flooding Frost action	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
Smokyhill-----	25	Very limited Flooding Low strength Shrink-swell Ponding	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Ponding Flooding	1.00 0.60
Mu: Muir-----	94	Very limited Low strength Frost action Flooding Shrink-swell	1.00 0.50 0.40 0.00	Somewhat limited Cutbanks cave	0.10	Not limited	
Oc: Orthents-----	100	Very limited Low strength	1.00	Somewhat limited Cutbanks cave	0.10	Not limited	
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	

BUILDING SITE DEVELOPMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Local roads and streets		Shallow excavations		Lawns and landscaping	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.82 0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Re: Reading-----	85	Very limited Low strength Shrink-swell Frost action Flooding	1.00 0.82 0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Sa: Sarpy-----	90	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Somewhat limited Flooding Droughty	0.60 0.36
Sc: Sarpy-----	90	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding	1.00 0.60	Very limited Droughty Flooding Too sandy Gravel content	1.00 0.60 0.50 0.08
Sh: Solomon-----	85	Very limited Shrink-swell Flooding Low strength Ponding Frost action	1.00 1.00 1.00 1.00 0.50	Very limited Ponding Flooding Too clayey Cutbanks cave	1.00 0.60 0.50 0.10	Very limited Too clayey Ponding Flooding	1.00 1.00 0.60
St: Sutphen-----	80	Very limited Shrink-swell Flooding Low strength Ponding	1.00 1.00 1.00 1.00	Very limited Ponding Flooding Too clayey Cutbanks cave	1.00 0.60 0.24 0.10	Very limited Too clayey Ponding Flooding	1.00 1.00 0.60
Tn: Tully-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.24 0.10	Not limited	
To: Tully-----	85	Very limited Shrink-swell Low strength	1.00 1.00	Somewhat limited Too clayey Cutbanks cave	0.24 0.10	Not limited	
Vc: Valentine-----	85	Somewhat limited Slope	0.16	Very limited Cutbanks cave Depth to dense layer Slope	1.00 0.50 0.16	Somewhat limited Slope	0.16
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.73 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ortello-----	30	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Wf: Wells-----	50	Very limited Low strength Shrink-swell Frost action	1.00 0.73 0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ortello-----	30	Somewhat limited Frost action	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	

CONSTRUCTION MATERIALS
Geary County, Kansas

Construction Materials

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

The soils are rated good, fair, or poor as potential sources of topsoil, reclamation material, and roadfill. The features that limit the soils as sources of these materials are specified in the tables. The numerical ratings given after the specified features indicate the degree to which the features limit the soils as sources of topsoil, reclamation material, or roadfill. The lower the number, the greater the limitation.

The soils are rated as a probable or improbable source of sand and gravel. A rating of probable means that the source material is likely to be in or below the soil. The numerical ratings in these columns indicate the degree of probability. The number 0.00 indicates that the soil is an improbable source. A number between 0.00 and 1.00 indicates the degree to which the soil is a probable source of sand or gravel.

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 these tables, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material. The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the lowest layer of the soil contains sand or gravel, the soil is rated as a probable source regardless of thickness. The assumption is that the sand or gravel layer below the depth of observation exceeds the minimum thickness.

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

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

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

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

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

The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential).

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Be: Benfield-----	42	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Florence-----	28	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cc: Clime-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cf: Clime-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sogn-----	20	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cr: Crete-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cs: Crete-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ct: Crete-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Eu: Eudora-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.07
Ge: Geary-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gf: Geary-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
He: Haynie-----	55	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.04
Hf: Hobbs-----	89	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hg: Hobbs-----	89	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Hm: Holder-----	95	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ho: Holder-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Id: Irwin-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ka: Kahola-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kb: Kahola-----	75	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ko: Konza-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lm: Ladysmith-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Lo: Longford-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Mccook-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.05
Mc: Mccook-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.05
Mk: Mccook-----	63	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.05
Smokyhill-----	25	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.05
Mu: Muir-----	94	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Oc: Orthents-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated	
Ra: Reading-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Re: Reading-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sa: Sarpy-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.22
Sc: Sarpy-----	90	Poor Bottom layer Thickest layer	0.00 0.00	Good Bottom layer Thickest layer	0.98 0.99
Sh: Solomon-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
St: Sutphen-----	80	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Tn: Tully-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
To: Tully-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vc: Valentine-----	85	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.70
W: Water-----	100	Not rated		Not rated	
We: Wells-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ortello-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.09 0.09
Wf: Wells-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ortello-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.09 0.09

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Poor Too clayey Droughty Depth to bedrock No water erosion limitation	0.00 0.99 0.99 0.99	Poor Depth to bedrock Low strength Shrink-swell Slope	0.00 0.00 0.01 0.82	Poor Too Clayey Slope Rock fragments Depth to bedrock	0.00 0.00 0.50 0.99
Florence-----	28	Poor Too clayey Droughty Cobble content	0.00 0.63 0.79	Poor Shrink-swell Low strength Cobble content Depth to bedrock	0.00 0.00 0.55 0.95	Poor Too Clayey Hard to reclaim Rock fragments Slope	0.00 0.00 0.00 0.84
Cc: Clime-----	75	Poor Too clayey Depth to bedrock Low content of organic matter Droughty Carbonate content	0.00 0.79 0.88 0.90 0.92	Poor Depth to bedrock Low strength Slope Shrink-swell	0.00 0.00 0.00 0.04	Poor Slope Too Clayey Depth to bedrock Carbonate content	0.00 0.00 0.79 0.92
Cf: Clime-----	60	Poor Too clayey Depth to bedrock Low content of organic matter Droughty Carbonate content	0.00 0.54 0.88 0.89 0.92	Poor Depth to bedrock Low strength Shrink-swell	0.00 0.00 0.06	Poor Too Clayey Slope Depth to bedrock Carbonate content	0.00 0.16 0.54 0.92
Sogn-----	20	Poor Droughty Depth to bedrock Too clayey	0.00 0.00 0.98	Poor Depth to bedrock Low strength	0.00 0.00	Poor Depth to bedrock Too Clayey	0.00 0.93
Cr: Crete-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.12 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.14	Poor Too Clayey	0.00
Cs: Crete-----	90	Poor Too clayey Low content of organic matter Too acid No water erosion limitation	0.00 0.50 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.14	Poor Too Clayey	0.00
Ct: Crete-----	90	Fair Too clayey Low content of organic matter Too acid No water erosion limitation	0.08 0.50 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.29	Fair Too Clayey	0.06
Eu: Eudora-----	85	Fair Low content of organic matter	0.02	Good		Good	
Ge: Geary-----	85	Fair Too clayey Too acid	0.92 0.92	Poor Low strength Shrink-swell	0.00 0.79	Fair Too Clayey	0.72
Gf: Geary-----	85	Fair Too clayey Too acid	0.92 0.92	Poor Low strength Shrink-swell	0.00 0.83	Fair Slope Too Clayey	0.63 0.72

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
He: Haynie-----	55	Fair Low content of organic matter Water erosion Carbonate content	0.50 0.90 0.97	Fair Low strength	0.78	Fair Carbonate content	0.97
Hf: Hobbs-----	89	Fair Low content of organic matter	0.88	Poor Low strength Shrink-swell	0.00 0.99	Good	
Hg: Hobbs-----	89	Fair Low content of organic matter	0.88	Poor Low strength Shrink-swell	0.00 0.99	Good	
Hm: Holder-----	95	Fair Too acid Too clayey	0.68 0.92	Poor Low strength Shrink-swell	0.00 0.84	Fair Too Clayey	0.72
Ho: Holder-----	75	Fair Too acid Too clayey	0.68 0.92	Poor Low strength Shrink-swell	0.00 0.84	Fair Too Clayey	0.72
Id: Irwin-----	85	Poor Too clayey Low content of organic matter Sodium content No water erosion limitation	0.00 0.50 0.97 0.99	Poor Low strength Shrink-swell	0.00 0.03	Poor Too Clayey Sodium content	0.00 0.98
Ka: Kahola-----	75	Good		Poor Low strength Shrink-swell	0.00 0.98	Good	
Kb: Kahola-----	75	Good		Poor Low strength Shrink-swell	0.00 0.98	Good	
Ko: Konza-----	85	Poor Too clayey Too acid No water erosion limitation	0.00 0.84 0.99	Poor Low strength Shrink-swell	0.00 0.01	Poor Too Clayey	0.00
Lm: Ladysmith-----	90	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Poor Low strength Shrink-swell	0.00 0.01	Poor Too Clayey	0.00
Lo: Longford-----	85	Fair Too clayey Too acid	0.08 0.97	Poor Low strength Shrink-swell	0.00 0.57	Fair Too Clayey	0.07
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Fair Low content of organic matter	0.50	Good		Good	

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mc: Mccook-----	85	Fair Low content of organic matter	0.50	Good		Good	
Mk: Mccook-----	63	Fair Low content of organic matter	0.50	Good		Good	
Smokyhill-----	25	Poor Too clayey Low content of organic matter No water erosion limitation	0.00 0.50 0.99	Fair Shrink-swell	0.99	Poor Too Clayey	0.00
Mu: Muir-----	94	Good		Poor Low strength	0.00	Good	
Oc: Orthents-----	100	Poor Low content of organic matter	0.00	Poor Low strength	0.00	Good	
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Fair Too clayey Too acid	0.92 0.95	Poor Low strength Shrink-swell	0.00 0.80	Fair Too Clayey	0.84
Re: Reading-----	85	Fair Too clayey Too acid	0.92 0.95	Poor Low strength Shrink-swell	0.00 0.80	Fair Too Clayey	0.84
Sa: Sarpy-----	90	Poor Too sandy Wind erosion Droughty Low content of organic matter	0.00 0.00 0.58 0.88	Good		Poor Too sandy	0.00
Sc: Sarpy-----	90	Poor Too sandy Wind erosion Droughty Low content of organic matter	0.00 0.00 0.00 0.12	Good		Poor Too sandy	0.00
Sh: Solomon-----	85	Poor Too clayey	0.00	Poor Low strength Shrink-swell	0.00 0.00	Poor Too Clayey	0.00
St: Sutphen-----	80	Poor Too clayey Low content of organic matter	0.00 0.32	Poor Low strength Shrink-swell	0.00 0.00	Poor Too Clayey	0.00
Tn: Tully-----	85	Fair Too clayey No water erosion limitation	0.82 0.99	Poor Low strength Shrink-swell	0.00 0.20	Fair Too Clayey	0.82

CONSTRUCTION MATERIALS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct. of map unit	Potential source of reclamation material		Potential source of roadfill		Potential source of topsoil	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
To: Tully-----	85	Fair Too clayey No water erosion limitation	0.82 0.99	Poor Low strength Shrink-swell	0.00 0.20	Fair Too Clayey	0.82
Vc: Valentine-----	85	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.12 0.98	Good		Poor Hard to reclaim Too sandy Slope	0.00 0.00 0.84
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Fair Low content of organic matter Too acid Too clayey	0.88 0.95 0.98	Poor Low strength Shrink-swell	0.00 0.88	Fair Too Clayey	0.70
Ortello-----	30	Fair Low content of organic matter	0.88	Good		Good	
WF: Wells-----	50	Fair Low content of organic matter Too acid Too clayey	0.88 0.95 0.98	Poor Low strength Shrink-swell	0.00 0.88	Fair Too Clayey	0.70
Ortello-----	30	Fair Low content of organic matter	0.88	Good		Good	

RECREATIONAL INTERPRETATIONS
Geary County, Kansas

Recreation

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

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

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

The information in this table can be supplemented by other information in this survey, for example, interpretations for building site development, construction materials, sanitary facilities, and water management.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The ratings are based on the soil properties that affect the ease of developing camp areas and the performance of the areas after development. Slope, stoniness, and depth to bedrock or a cemented pan are the main concerns affecting the development of camp areas.

The soil properties that affect the performance of the areas after development are those that influence trafficability and promote the growth of vegetation, especially in heavily used areas. For good trafficability, the surface of camp areas should absorb rainfall readily, remain firm under heavy foot traffic, and not be dusty when dry. The soil properties that influence trafficability are texture of the surface layer, depth to a water table, ponding, flooding, permeability, and large stones. The soil properties that affect the growth of plants are depth to bedrock or a cemented pan, permeability, and toxic substances in the soil.

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

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

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

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

RECREATIONAL INTERPRETATIONS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Slope Restricted permeability	1.00 0.39	Very limited Slope Restricted permeability	1.00 0.39	Very limited Slope Restricted permeability Depth to bedrock	1.00 0.39 0.01
Florence-----	28	Somewhat limited Gravel content Slope	0.54 0.16	Somewhat limited Gravel content Slope	0.54 0.16	Very limited Slope Gravel content Content of large stones	1.00 1.00 0.00
Cc: Clime-----	75	Very limited Slope Restricted permeability Too Stony	1.00 0.39 0.00	Very limited Slope Restricted permeability Too Stony	1.00 0.39 0.00	Very limited Slope Restricted permeability Depth to bedrock Content of large stones Gravel content	1.00 0.39 0.20 0.03 0.00
Cf: Clime-----	60	Somewhat limited Slope Restricted permeability	0.84 0.39	Somewhat limited Slope Restricted permeability	0.84 0.39	Very limited Slope Depth to bedrock Restricted permeability	1.00 0.46 0.39
Sogn-----	20	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope Content of large stones	1.00 0.87 0.00
Cr: Crete-----	90	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39
Cs: Crete-----	90	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability Slope	0.39 0.13
Ct: Crete-----	90	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Very limited Slope Restricted permeability	1.00 0.39
Eu: Eudora-----	85	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Ge: Geary-----	85	Not limited		Not limited		Very limited Slope	1.00
Gf: Geary-----	85	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
He: Haynie-----	55	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Hf: Hobbs-----	89	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Hg: Hobbs-----	89	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Hm: Holder-----	95	Not limited		Not limited		Somewhat limited Slope	0.00
Ho: Holder-----	75	Not limited		Not limited		Somewhat limited Slope	0.87
Id: Irwin-----	85	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.87 0.45
Ka: Kahola-----	75	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Kb: Kahola-----	75	Very limited		Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ko: Konza-----	85	Flooding	1.00			Flooding	0.60
		Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.45
Lm: Ladysmith-----	90	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
Lo: Longford-----	85	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability Slope	0.39
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Mc: Mccook-----	85	Very limited Flooding	1.00	Not limited		Not limited	
Mk: Mccook-----	63	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Smokyhill-----	25	Very limited Flooding	1.00	Very limited Ponding	1.00	Very limited Ponding	1.00
		Ponding	1.00	Restricted permeability	0.39	Flooding	0.60
		Restricted permeability	0.39			Restricted permeability	0.39
Mu: Muir-----	94	Very limited Flooding	1.00	Not limited		Not limited	
Oc: Orthents-----	100	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Slope	1.00
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	0.50
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15
		Restricted permeability	0.15				
Re: Reading-----	85	Very limited Flooding	1.00	Somewhat limited Restricted permeability	0.15	Somewhat limited Restricted permeability	0.15
		Restricted permeability	0.15				
Sa: Sarpy-----	90	Very limited Flooding Too sandy	1.00 0.49	Somewhat limited Too sandy	0.49	Somewhat limited Flooding Too sandy Slope	0.60 0.49 0.00
Sc: Sarpy-----	90	Very limited Flooding Too sandy Gravel content	1.00 0.41 0.08	Somewhat limited Too sandy Gravel content	0.41 0.08	Very limited Gravel content Flooding Too sandy Slope	1.00 0.60 0.41 0.00
Sh: Solomon-----	85	Very limited Flooding	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Restricted permeability	1.00	Too clayey	1.00	Too clayey	1.00
		Too clayey	1.00	Ponding	1.00	Ponding	1.00
		Ponding	1.00			Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Camp areas		Picnic areas		Playgrounds	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
St: Sutphen-----	80	Very limited Flooding Ponding Too clayey Restricted permeability	1.00 1.00 0.50 0.45	Very limited Ponding Too clayey Restricted permeability	1.00 0.50 0.45	Very limited Ponding Flooding Too clayey Restricted permeability	1.00 0.60 0.50 0.45
Tn: Tully-----	85	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability Slope	0.39 0.13
To: Tully-----	85	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Very limited Slope Restricted permeability	1.00 0.39
Vc: Valentine-----	85	Somewhat limited Too sandy Slope	0.96 0.16	Somewhat limited Too sandy Slope	0.96 0.16	Very limited Slope Too sandy	1.00 0.96
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Not limited		Not limited		Somewhat limited Slope	0.13
Ortello-----	30	Not limited		Not limited		Somewhat limited Slope	0.13
Wf: Wells-----	50	Not limited		Not limited		Very limited Slope	1.00
Ortello-----	30	Not limited		Not limited		Very limited Slope	1.00

RECREATIONAL INTERPRETATIONS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Somewhat limited Slope	0.18	Very limited Slope	1.00
				Depth to bedrock	0.01
Florence-----	28	Not limited		Somewhat limited Gravel content	0.54
				Droughty	0.22
				Slope	0.16
				Content of large stones	0.00
Cc: Clime-----	75	Very limited Slope	1.00	Very limited Slope	1.00
		Too Stony	0.00	Depth to bedrock	0.20
				Content of large stones	0.03
Cf: Clime-----	60	Not limited		Somewhat limited Slope	0.84
				Depth to bedrock	0.46
Sogn-----	20	Not limited		Very limited Depth to bedrock	1.00
				Droughty	1.00
				Content of large stones	0.00
Cr: Crete-----	90	Not limited		Not limited	
Cs: Crete-----	90	Not limited		Not limited	
Ct: Crete-----	90	Not limited		Not limited	
Eu: Eudora-----	85	Not limited		Somewhat limited Flooding	0.60
Ge: Geary-----	85	Not limited		Not limited	
Gf: Geary-----	85	Not limited		Somewhat limited Slope	0.37
He: Haynie-----	55	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Hf: Hobbs-----	89	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Hg: Hobbs-----	89	Not limited		Somewhat limited Flooding	0.60
Hm: Holder-----	95	Not limited		Not limited	
Ho: Holder-----	75	Not limited		Not limited	
Id: Irwin-----	85	Not limited		Not limited	
Ka: Kahola-----	75	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
Kb: Kahola-----	75	Not limited		Somewhat limited Flooding	0.60
Ko: Konza-----	85	Not limited		Not limited	
Lm: Ladysmith-----	90	Not limited		Not limited	
Lo: Longford-----	85	Not limited		Not limited	
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Mccook-----	85	Not limited		Somewhat limited Flooding	0.60
Mc: Mccook-----	85	Not limited		Not limited	
Mk: Mccook-----	63	Not limited		Somewhat limited Flooding	0.60
Smokyhill-----	25	Very limited Ponding	1.00	Very limited Ponding	1.00
				Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Paths and trails		Golf fairways	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Mu:					
Muir-----	94	Not limited		Not limited	
Oc:					
Orthents-----	100	Not limited		Not limited	
Or:					
Orthents, Earthen Dam-----	100	Not rated		Not rated	
Pt:					
Pits, Quarries-----	100	Not rated		Not rated	
Ra:					
Reading-----	85	Not limited		Not limited	
Re:					
Reading-----	85	Not limited		Not limited	
Sa:					
Sarpy-----	90	Somewhat limited Too sandy	0.49	Somewhat limited Flooding Droughty	0.60 0.36
Sc:					
Sarpy-----	90	Somewhat limited Too sandy	0.41	Very limited Droughty Flooding Too sandy Gravel content	1.00 0.60 0.50 0.08
Sh:					
Solomon-----	85	Very limited Too clayey Ponding	1.00 1.00	Very limited Too clayey Ponding Flooding	1.00 1.00 0.60
St:					
Sutphen-----	80	Very limited Ponding Too clayey	1.00 0.50	Very limited Too clayey Ponding Flooding	1.00 1.00 0.60
Tn:					
Tully-----	85	Not limited		Not limited	
To:					
Tully-----	85	Not limited		Not limited	
Vc:					
Valentine-----	85	Somewhat limited Too sandy	0.96	Somewhat limited Slope	0.16
W:					
Water-----	100	Not rated		Not rated	
We:					
Wells-----	50	Not limited		Not limited	
Ortello-----	30	Not limited		Not limited	
Wf:					
Wells-----	50	Not limited		Not limited	
Ortello-----	30	Not limited		Not limited	

WILDLIFE INTERPRETATIONS
Geary County, Kansas

Use and Explanation of Wildlife Interpretations

Soils directly affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the development of water impoundments. The kind and abundance of wildlife that populate an area depend largely on the amount and distribution of food, cover, water, and living space. If any one of these elements is missing, inadequate, or inaccessible, wildlife will be scarce or will not inhabit the area. If the soils have the potential, 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.

In the Wildlife Interpretations table, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

Suitability Ratings

The potential of the soil is rated good, fair, poor, or very poor.

Good - means that the element of wildlife habitat or the kind of habitat is easily created, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected if the soil is used for the designated purpose.

Fair - means that the element of wildlife habitat or kind of habitat can be created, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.

Poor - means that limitations are severe for the designated element or kind of wildlife habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and requires intensive effort.

Very Poor - means that limitations are very severe for the designated element or kind of wildlife habitat. Habitat is difficult to create, improve, or maintain in most places, and management is difficult and requires intensive effort.

Description of Wildlife Habitat Elements

Openland habitat consists of croplands, pastures, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The kind of wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, killdeer, cottontail rabbit, red fox, and coyote.

Woodland habitat consists of hardwood or conifers, or a mixture of these and associated grasses, legumes and wild herbaceous plants. Examples of wildlife attracted to this habitat are wild turkey, thrushes, woodpeckers, owl, tree squirrels, raccoon, and deer.

Wetland habitat consists of water-tolerant plants in open, marshy or swampy, shallow water areas. Examples of wildlife attracted to this habitat are ducks, geese, herons, bitterns, rails, kingfishers, shorebirds, muskrat, mink, and beaver.

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

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flooding, and slope. Soil temperature and soil moisture also are considerations. Examples of grasses and legumes are fescue, lovegrass, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flooding. Soil temperature and soil moisture also are considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, wheatgrass, and grama.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated good are Russian-olive, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Shrubs are bushy woody plants that produce fruit, buds, twigs, bark, and foliage. Soil properties and features that affect the growth of shrubs are depth of the root zone, available water capacity, salinity, and soil moisture. Examples of shrubs are fragrant sumac, chokecherry, American plum, sand plum, and gorden currant.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, saltgrass, cordgrass, rushes, sedges, and cattails.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, pheasant, meadowlark, field sparrow, cottontail, red fox and coyote.

Habitat for woodland wildlife consists of areas of deciduous and/or coniferous plants and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, thrushes, woodpeckers, squirrels, gray fox, raccoon, and deer.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, and beaver.

Habitat for rangeland wildlife consists of areas of shrubs and wild herbaceous plants. Wildlife attracted to rangeland include antelope, deer, cottontail rabbit, prairie chicken, meadowlark, quail, and pheasant.

WILDLIFE INTERPRETATIONS
Geary County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Be: BENFIELD-----	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
FLORENCE-----	Poor	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Cc: CLIME-----	Poor	Fair	Fair	---	---	Poor	---	Poor	Fair	---	Very poor	Fair
Cf: CLIME-----	Fair	Fair	Good	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
SOGN-----	Very poor	Very poor	Poor	---	---	Poor	Very poor	Very poor	Very poor	---	Very poor	Poor
Cr: CRETE-----	Good	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Good
Cs: CRETE-----	Good	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Good
Ct: CRETE-----	Fair	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Good
Eu: EUDORA-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
Ge: GEARY-----	Fair	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Good
Gf: GEARY-----	Fair	Good	Good	Fair	Fair	Fair	Very poor	Very poor	Good	Fair	Very poor	Good
He: HAYNIE-----	Fair	Fair	Fair	Fair	Poor	---	Poor	Poor	Fair	Fair	Poor	---
Hf: HOBBS-----	Poor	Fair	Fair	Fair	Fair	Fair	Very poor	Very poor	Fair	Fair	Very poor	Fair
Hg: HOBBS-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	Good
Hm: HOLDER-----	Good	Good	Good	Good	Fair	Fair	Very poor	Very poor	Good	Good	Very poor	Good
Ho: HOLDER-----	Fair	Good	Good	Good	Fair	Fair	Very poor	Very poor	Good	Good	Very poor	Good
Id: IRWIN-----	Fair	Good	Good	Good	Good	Fair	Poor	Poor	Fair	Good	Poor	Fair
Ka: KAHOLA-----	Poor	Fair	Fair	Good	Good	Good	Poor	Fair	Fair	Good	Poor	Good
Kb: KAHOLA-----	Good	Good	Good	Good	Good	Good	Poor	Fair	Good	Good	Poor	Good
Ko: KONZA-----	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Fair	Poor
Lm: LADYSMITH-----	Fair	Good	Good	---	---	Good	Poor	Fair	Good	---	Poor	Good
Lo: LONGFORD-----	Good	Good	Fair	---	---	Fair	Poor	Fair	Good	---	Poor	Fair
M-W: MISCELLANEOUS WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
Mb: MCCOOK-----	Good	Good	Good	Good	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good

WILDLIFE INTERPRETATIONS--Continued
Geary County, Kansas

Map symbol and soil name	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
Mc: MCCOOK-----	Good	Good	Good	Good	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
Mk: MCCOOK-----	Good	Good	Good	Good	Fair	Good	Very poor	Very poor	Good	Fair	Very poor	Good
SMOKYHILL-----	Good	Good	Good	Good	Good	Good	Fair	Fair	Fair	Fair	Good	Fair
Mu: MUIR-----	Good	Good	Good	Good	Good	Good	Poor	Very poor	Good	Good	Very poor	Good
Oc: ORTHENTS-----	---	---	---	---	---	---	---	---	---	---	---	---
Or: ORTHENTS, EARTHEN DAM----	---	---	---	---	---	---	---	---	---	---	---	---
Pt: Pits, quarries--	---	---	---	---	---	---	---	---	---	---	---	---
Ra: READING-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Re: READING-----	Good	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor	---
Sa: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
Sc: SARPY-----	Poor	Poor	Fair	Poor	Poor	---	Very poor	Very poor	Poor	Poor	Very poor	---
Sh: SOLOMON-----	Fair	Fair	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good	---
St: SUTPHEN-----	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Good	Fair	Fair	Fair	---
Tn: TULLY-----	Good	Good	Good	---	---	Fair	Poor	Poor	Good	---	Poor	Fair
To: TULLY-----	Fair	Good	Good	---	---	Fair	Poor	Poor	Fair	---	Poor	Fair
Vc: VALENTINE-----	Poor	Fair	Fair	Poor	Poor	Poor	Very poor	Very poor	Fair	Poor	Very poor	Fair
W: WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
We: WELLS-----	Good	Good	Good	---	---	Fair	Very poor	Very poor	Good	---	Very poor	Fair
ORTELLO-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Good	Good	Very poor	Good
Wf: WELLS-----	Good	Good	Good	---	---	Fair	Very poor	Very poor	Good	---	Very poor	Fair
ORTELLO-----	Fair	Good	Good	Good	Good	Good	Very poor	Very poor	Fair	Good	Very poor	Good

YIELDS PER ACRE OF PASTURE AND HAYLAND
Geary County, Kansas

Use and Explanation of Pastureland and Hayland Interpretations

This subsection provides information concerning the suitability of soils for the production of pasture and hayland. This subsection may contain pasture and hayland suitability groupings, land capability and yield estimates, yield estimates for individual grasses or legumes, or other information pertaining to the production of forage.

Pasture and Hayland Suitability Groupings

Soils are placed in pasture and hayland groups according to their suitability for the production of forage. The soils in each group are enough alike to be suited to the same grasses or legumes, to have similar limitations and hazards, to require similar management, and to have similar productivity and other responses to management. Thus, the pasture and hayland suitability group is a convenient way of grouping the soils for their management. If used, these groupings are identified and described in other reports in the subsection.

Yield Estimates

The average yields per acre that can be expected of the principal pasture or hayland crops, under a high level of management, are presented in this subsection. In any given year, yields may be higher or lower than those indicated in the tables because of variations in rainfall or other climatic factors. The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

Under good management, proper grazing is essential for the production of high quality forage, stand survival, and erosion control. Proper grazing helps plants 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 are also important management practices.

The Pasture and Hayland table show yield estimates in tons per acre and animal unit months for pasture and hayland groups. An animal unit month is the amount of forage required by one animal unit (AU) for 30 days. On animal unit (AU) is one (1000 pound) mature cow and a calf up to weaning age (usually six months of age) or their equivalent. The Natural Resources Conservation Service uses 900 pounds of air dry forage as the amount needed to meet this requirement. To maintain a healthy and vigorous plant community, the degree of use should never be greater than 50 percent. Therefore only 25 percent of the total biomass grown is considered consumed by the grazing animal. Animal Unit Months can be converted to air dry pounds per acre production by multiplying the AUM by 30 days, then by 30 pounds per day, and then by four. This figure is the amount of total forage production.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil in the Nontechnical Description section. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

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

Map symbol and soil name	Land capability		Grain sorghum	
	N	I	N	I
			Bu	Bu
Be: Benfield-----	6e	---	---	---
Florence-----	6e	---	---	---
Cc: Clime-----	7e	---	---	---
Cf: Clime-----	6e	---	---	---
Sogn-----	6s	---	---	---
Cr: Crete-----	2s	---	64.00	---
Cs: Crete-----	2e	---	64.00	---
Ct: Crete-----	3e	---	64.00	---
Eu: Eudora-----	2w	---	70.00	---
Ge: Geary-----	3e	---	61.00	---
Gf: Geary-----	6e	---	---	---
He: Haynie-----	5w	---	---	---
Hf: Hobbs-----	5w	---	---	---
Hg: Hobbs-----	2w	---	77.00	---
Hm: Holder-----	2e	---	61.00	---
Ho: Holder-----	3e	---	61.00	---
Id: Irwin-----	4e	---	47.00	---
Ka: Kahola-----	5w	---	---	---
Kb: Kahola-----	2w	---	77.00	---
Ko: Konza-----	3e	---	47.00	---
Lm: Ladysmith-----	2s	---	60.00	---
Lo: Longford-----	2e	---	61.00	---
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Mccook-----	2w	---	61.00	---
Mc: Mccook-----	1	---	61.00	---
Mk: Mccook-----	2w	---	61.00	---
Smokyhill-----	2w	---	64.00	---
Mu: Muir-----	1	---	77.00	---

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

Map symbol and soil name	Land capability		Grain sorghum	
	N	I	N	I
			Bu	Bu
Oc: Orthents-----	7s	---	---	---
Or: Orthents, Earthen Dam----	8s	---	---	---
Pt: Pits, Quarries-----	---	---	---	---
Ra: Reading-----	1	---	73.00	---
Re: Reading-----	1	---	72.00	---
Sa: Sarpy-----	4s	---	39.00	---
Sc: Sarpy-----	6s	---	---	---
Sh: Solomon-----	3w	---	45.00	---
St: Sutphen-----	3w	---	61.00	---
Tn: Tully-----	2e	---	67.00	---
To: Tully-----	3e	---	58.00	---
Vc: Valentine-----	6e	---	---	---
W: Water-----	---	---	---	---
We: Wells-----	3e	---	64.00	---
Ortello-----	3e	---	60.00	---
Wf: Wells-----	4e	---	58.00	---
Ortello-----	4e	---	56.00	---

CONSERVATION TREE AND SHRUB MANAGEMENT
Geary County, Kansas

A Conservation Tree/Shrub Suitability Group (CTSG), formerly Windbreak Suitability Group, is a physiographic unit or area having similar climatic and edaphic characteristics that control the selection and height growth of trees and shrubs.

In this table, the Conservation Tree and Shrub Grouping is expressed as a group index number. The group index for Conservation Tree and Shrub groups (CTSG) are a guide for species best suited for different kinds of soil and for prediction height, growth, and effectiveness. The groupings can be used when selection woody plants for windbreaks, wildlife plantings riparian buffers, reforestation, other environmental plantings, recreation, landscaping, wetland restoration or enhancement and critical area plantings. CTSG's are developed to assure satisfactory species selection and adaptation to specific conditions of soil, climate and physiography. CTSG's are a guide for selection species best suited for different kinds of soil and prediction height growth and effectiveness.

All soil series mapped in the state have been placed in 10 groups of similar soil characteristics. Groups 1, 2, 3, 4, 6, and 9 are further divided into subgroups. In addition, all groups provide information by Major Land Resource Areas.

Each tree or shrub species has certain climatic and physiographic limits. Within these parameters a tree or shrub may be well or poorly suited because of soil characteristics. Each tree or shrub also has definable potentials of height growth depending on the factors just mentioned. Accurate definitions of potential heights are necessary for proper windbreak planning and design.

Windbreaks protect livestock, buildings, roads and yards from wind and snow. They also protect fruit trees and gardens, and they furnish habitat for wildlife. Several rows of low-growing 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 grow trees originally. Knowledge of how trees perform on such land can be gained only by observing and recording their performance where trees have been planted and survived. The problem is compounded by the fact that many favorite windbreak species are not indigenous to the areas in which they are planted.

The Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups shows the adapted species listing for each group index number. Showing the height that locally grown trees and shrubs are expected to reach in 20 years on various soils. The estimates are based on measurements and observation of established plantings that have been given adequate care. This information should be used to determine the placement of a windbreak, the area protected and the arrangement of species.

A number of attributes are included in the CTSG species tables for each group number found in this section of the Field Office Technical Guide. These attributes were rated subjectively and assigned a relative value to further assist those unfamiliar with individual species characteristics or desirability for the intended use. Definitions and explanations can be found. Additional information on planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local office of the Natural Resources Conservation Service or of the Cooperative Extension Service or from a commercial nursery. See part 537 of the National Forestry Manual for additional information.

In the Tree and Shrub Management table interpretive ratings are given for various aspects of forest and conservation tree and shrub management. Some rating class terms indicate the degree to which the soils are suited to a specified forest management practice. Well suited indicates that the soil has features that are favorable for the specified practice and has no limitations. Good performance can be expected, and little or no maintenance is needed. Moderately well suited indicates that the soil has features that are moderately favorable for the specified practice. One or more soil properties are less than desirable and fair performance can be expected. Some maintenance is needed. Poorly suited indicates that the soil has one or more properties that are unfavorable for the specified practice. Overcoming the unfavorable properties requires special design, extra maintenance, and costly alteration. Unsuitable indicates that the expected performance of the soil is unacceptable for the specified practice or that extreme measures are needed to overcome the undesirable soil properties.

The paragraphs that follow indicate the soil properties considered in rating the soils for forest and conservation tree and shrub management practices. More detailed information about the criteria used in the ratings is available in the "National Forestry Manual," which is available in local offices of the Natural Resources Conservation Service or on the Internet. Also, in the Kansas Field Office Technical Guide Notice KS-230, Conservation Tree and Shrub Plantings Suitability Groups.

Ratings in the columns suitability for hand planting and suitability for mechanical planting are based on slope, depth to a restrictive layer, content of sand, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, moderately well suited, poorly suited, or unsuited to these methods of planting. It is assumed that necessary site preparation is completed before seedlings are planted.

Ratings in the column suitability for mechanical site preparation (surface) are based on slope, depth to a restrictive layer, plasticity index, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 1-foot is considered in the ratings.

Ratings in the column suitability for mechanical site preparation (deep) are based on slope, depth to a restrictive layer, rock fragments on or below the surface, depth to a water table, and ponding. The soils are described as well suited, poorly suited, or unsuited to this management activity. The part of the soil from the surface to a depth of about 3 feet is considered in the ratings.

Ratings in the column potential for seedling mortality are based on flooding, ponding, depth to a water table, content of lime, reaction, salinity, available water capacity, soil moisture regime, soil temperature regime, aspect, and slope. The soils are described as having a low, moderate, or high potential for seedling mortality. See the National Forestry Manual, Subpart B for criteria used in rating management concerns. Specific information on plants and yields can be obtained from the local office of the Natural Resources Conservation Service or the Cooperative Extension Service.

CONSERVATION TREE AND SHRUB MANAGEMENT
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Be: Benfield-----	4C	Moderately suited Stickiness	Poorly suited Slope Stickiness Rock fragments	Poorly suited Slope	Poorly suited Slope	Low
Florence-----	6D	Poorly suited Stickiness Rock fragments	Poorly suited Rock fragments Stickiness Slope	Poorly suited Rock fragments Stickiness	Well suited	Low
Cc: Clime-----	8	Moderately suited Stickiness	Unsuited Slope Stickiness Rock fragments	Poorly suited Slope Rock fragments Stickiness	Poorly suited Slope	Moderate Lime
Cf: Clime-----	8	Moderately suited Stickiness	Moderately suited Slope Stickiness Rock fragments	Poorly suited Stickiness	Well suited	Moderate Lime
Sogn-----	10	Unsuited Restrictive layer	Moderately suited Slope Restrictive layer	Poorly suited Restrictive layer	Well suited	Low
Cr: Crete-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Cs: Crete-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Ct: Crete-----	4C	Poorly suited Stickiness	Poorly suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Eu: Eudora-----	1	Well suited	Well suited	Well suited	Well suited	Low
Ge: Geary-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Gf: Geary-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
He: Haynie-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Lime
Hf: Hobbs-----	1	Well suited	Well suited	Well suited	Well suited	Low
Hg: Hobbs-----	1	Well suited	Well suited	Well suited	Well suited	Low
Hm: Holder-----	3	Well suited	Well suited	Well suited	Well suited	Low
Ho: Holder-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Id: Irwin-----	4C	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ka: Kahola-----	1	Well suited	Well suited	Well suited	Well suited	Low
Kb: Kahola-----	1	Well suited	Well suited	Well suited	Well suited	Low
Ko: Konza-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. Pines and spruces are prone to disease problems. See text for further explanation of ratings in this table.)

Map symbol and soil name	Wind break Group	Suitability for hand planting	Suitability for mechanical planting	Suitability for mechanical site preparation (surface)	Suitability for mechanical site preparation (deep)	Potential for seedling mortality
		Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features	Rating class and limiting features
Lm: Ladysmith-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Lo: Longford-----	3	Well suited	Well suited	Well suited	Well suited	Low
M-W: Miscellaneous Water-		Not rated	Not rated	Not rated	Not rated	Not rated
Mb: Mccook-----	1	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Mc: Mccook-----	1	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Mk: Mccook-----	1	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Smokyhill-----	7	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Mu: Muir-----	1	Well suited	Well suited	Well suited	Well suited	Low
Oc: Orthents-----		Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	Unsuited Horizon table contains no data	High Horizon table contains no data
Or: Orthents, Earthen Dam-----		Not rated	Not rated	Not rated	Not rated	Not rated
Pt: Pits, Quarries-----		Not rated	Not rated	Not rated	Not rated	Not rated
Ra: Reading-----	1	Well suited	Well suited	Well suited	Well suited	Low
Re: Reading-----	1	Well suited	Well suited	Well suited	Well suited	Low
Sa: Sarpy-----	1K	Well suited	Well suited	Well suited	Well suited	Low
Sc: Sarpy-----		Moderately suited Sandiness	Moderately suited Sandiness Rock fragments	Well suited	Well suited	Low
Sh: Solomon-----	2	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	High Wetness Soil reaction
St: Sutphen-----	4C	Poorly suited Stickiness	Poorly suited Stickiness	Poorly suited Stickiness	Well suited	Low
Tn: Tully-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
To: Tully-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Vc: Valentine-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
W: Water-----		Not rated	Not rated	Not rated	Not rated	Not rated
We: Wells-----	3	Well suited	Well suited	Well suited	Well suited	Low
Ortello-----	5	Well suited	Well suited	Well suited	Well suited	Low
Wf: Wells-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ortello-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low

ENGINEERING INDEX PROPERTIES
Geary County, Kansas

Engineering Index Properties table gives the engineering classifications and the range of index properties for the layers of each soil in the survey area. Depth to the upper and lower boundaries of each layer is indicated. Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. Loam, for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, gravelly. Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (ASTM, 1998) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 1998). The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection. If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in Engineering Index Properties table.

Rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

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

ENGINEERING INDEX PROPERTIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct					Pct	
Be: Benfield-----	In											
	0-5	Silty clay loam	CL	A-7-6	0	0-5	93-100	91-100	86-100	77-95	36-44	16-22
	5-10	Silty clay loam	CH	A-7-6	0	0-5	80-100	76-100	72-100	65-95	44-53	22-29
	10-19	Gravelly silty clay	CH	A-7-6	0	0-5	60-80	50-74	45-74	45-70	44-57	22-32
	19-34	Silty clay	CH	A-7-6	0	0-5	80-92	76-90	72-90	68-86	44-62	22-36
	34-38	Silty clay	CH	A-7-6	0	0	100	100	95-100	90-95	48-66	25-39
	38-56	Weathered bedrock			---	---	---	---	---	---	---	---
Florence-----	0-5	Gravelly silt loam	CL, GC	A-7-6	0	0-10	58-92	48-90	43-90	34-81	40-51	20-29
	5-14	Very gravelly silty clay	GC, CH	A-7-6	0	0-40	30-80	11-75	10-75	8-70	51-71	29-45
	14-48	Very cobbly clay	CH, GC	A-7	0	25-50	42-68	26-61	23-61	20-58	66-96	41-65
	48-56	Extremely cobbly silty clay	CH, GC	A-2-7	0	50-90	20-88	3-85	3-85	3-81	66-96	41-65
	56-60	Unweathered bedrock			---	---	---	---	---	---	---	---
Cc: Clime-----	0-2	Silty clay loam	CL	A-7-6	0-5	0-12	84-100	79-100	75-100	67-95	40-48	19-25
	2-9	Silty clay	CH, CL	A-7-6	0	0-12	84-100	79-100	75-100	67-95	40-57	19-32
	9-27	Silty clay	CH, CL	A-7-6	0	0	92-100	90-100	86-100	77-95	44-57	22-32
	27-33	Silty clay	CH, CL	A-7-6	0	0	100	100	95-100	77-95	44-57	22-32
	33-37	Weathered bedrock			---	---	---	---	---	---	---	---
Cf: Clime-----	0-12	Silty clay loam	CL	A-7-6	0	0-5	86-100	82-100	78-100	70-95	41-48	20-25
	12-26	Silty clay	CH, CL	A-7-6	0	0-5	86-100	82-100	78-100	70-95	44-57	22-32
	26-30	Silty clay	CH, CL	A-7-6	0	0	86-100	82-100	78-100	70-95	44-57	22-32
	30-34	Weathered bedrock			---	---	---	---	---	---	---	---
Sogn-----	0-9	Silty clay loam	CL	A-6, A-7-6	0	0-10	85-100	82-100	78-100	70-95	36-44	16-22
	9-13	Unweathered bedrock			---	---	---	---	---	---	---	---
Cr: Crete-----	0-6	Silty clay loam	CL	A-7-6	0	0	100	100	97-100	88-99	40-51	20-29
	6-14	Silty clay loam	CL	A-7-6	0	0	100	100	97-100	96-99	43-51	23-29
	14-30	Silty clay	CH	A-7-6	0	0	100	100	97-100	96-99	51-71	29-45
	30-42	Silty clay loam	CL, CH	A-7-6	0	0	100	100	97-100	96-99	46-61	25-36
	42-60	Silty clay loam	CL, CH	A-7-6	0	0	100	100	97-100	88-99	41-56	21-33
Cs: Crete-----	0-6	Silty clay loam	CL	A-7-6	0	0	100	100	97-100	88-99	40-51	20-29
	6-11	Silty clay loam	CL	A-7-6	0	0	100	100	97-100	96-99	43-51	23-29
	11-27	Silty clay	CH	A-7-6	0	0	100	100	97-100	96-99	51-71	29-45
	27-40	Silty clay loam			0	0	100	100	97-100	96-99	46-61	25-36
	40-60	Silty clay loam			0	0	100	100	97-100	88-99	41-56	21-33
Ct: Crete-----	0-6	Silty clay loam	CL	A-7-6	0	0	100	100	97-100	88-99	40-51	20-29
	6-16	Silty clay	CH	A-7-6	0	0	100	100	97-100	96-99	51-71	29-45
	16-29	Silty clay loam	CL, CH	A-7-6	0	0	100	100	97-100	96-99	46-61	25-36
	29-46	Silty clay loam	CL, CH	A-7-6	0	0	100	100	97-100	88-99	41-56	21-33
	46-60	Silt loam	CL, CH	A-7-6	0	0	100	100	97-100	88-99	41-56	21-33
Eu: Eudora-----	0-7	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	90-100	70-90	17-30	1-11
	7-14	Silt loam	CL, ML	A-4	0	0	100	100	90-100	70-90	17-30	1-11
	14-19	Silt loam	CL	A-4	0	0	100	100	90-100	70-90	17-28	1-10
	19-26	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	85-100	50-90	17-28	1-10
	26-60	Very fine sandy loam	CL	A-4	0	0	100	100	85-100	50-90	17-28	1-10
Ge: Geary-----	0-8	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	60-97	26-36	8-16
	8-18	Silt loam	CL	A-6	0	0	100	100	90-100	60-97	30-41	11-19
	18-25	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	60-97	36-46	16-24
	25-48	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-97	36-46	16-24
	48-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	90-100	60-97	30-44	8-22
Gf: Geary-----	0-6	Silt loam	CL	A-4, A-6	0	0	100	100	90-100	60-97	26-36	8-16
	6-10	Silt loam	CL	A-6	0	0	100	100	90-100	60-97	30-41	11-19
	10-16	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	60-97	36-46	16-24
	16-38	Silty clay loam	CL	A-6, A-7-6	0	0	100	100	90-100	60-97	36-46	16-24
	38-60	Silt loam	CL	A-6, A-7	0	0	100	100	90-100	60-97	30-44	8-22
He: Haynie-----	0-10	Silt loam	CL	A-6, A-4	0	0	100	100	85-100	70-100	26-35	8-15
	10-60	Very fine sandy loam	CL, CL-ML	A-4	0	0	100	100	85-100	85-100	21-28	4-10
Hf: Hobbs-----	0-8	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	85-100	26-36	8-16
	8-24	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	85-100	26-36	8-16
	24-44	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	80-100	26-39	8-18
	44-60	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	80-100	26-39	8-18
Hg: Hobbs-----	0-8	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	85-100	26-36	8-16
	8-24	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	85-100	26-36	8-16
	24-44	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	80-100	26-39	8-18
	44-60	Silt loam	CL	A-6, A-4	0	0	100	100	95-100	80-100	26-39	8-18

ENGINEERING INDEX PROPERTIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct					Pct	
Hm:	In											
Holder-----	0-8	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-36	8-16
	8-14	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
	14-45	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	60-97	37-44	17-22
	45-58	Silty clay loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
	58-60	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
Ho:												
Holder-----	0-8	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-36	8-16
	8-14	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
	14-45	Silty clay loam	CL	A-7-6, A-6	0	0	100	100	90-100	60-97	37-44	17-22
	45-58	Silty clay loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
	58-60	Silt loam	CL	A-6, A-4	0	0	100	100	90-100	60-97	26-39	8-18
Id:												
Irwin-----	0-6	Silty clay loam	CL	A-7-6	0	0	93-100	91-100	86-100	77-95	37-44	17-22
	6-13	Silty clay loam	CL	A-7-6	0	0	93-100	91-100	86-100	77-95	37-44	17-22
	13-30	Silty clay	CH	A-7-6	0	0	93-100	91-100	82-100	68-95	48-66	25-39
	30-41	Silty clay	CH	A-7-6	0	0	93-100	91-100	82-100	68-95	48-66	25-39
	41-72	Silty clay	CH	A-7-6	0	0	93-100	91-100	86-100	77-95	44-62	22-36
Ka:												
Kahola-----	0-24	Silt loam	CL	A-6	0	0	94-100	91-100	82-100	64-90	28-36	10-16
	24-36	Silt loam	CL	A-6	0	0	94-100	91-100	82-100	64-90	28-36	10-16
	36-44	Silt loam	CL	A-6, A-7	0	0	94-100	91-100	82-100	64-90	28-44	10-22
	44-60	Silt loam	CL	A-6, A-7	0	0	94-100	91-100	82-100	64-90	28-44	10-22
Kb:												
Kahola-----	0-24	Silt loam	CL	A-6	0	0	94-100	91-100	82-100	64-90	28-36	10-16
	24-36	Silt loam	CL	A-6	0	0	94-100	91-100	82-100	64-90	28-36	10-16
	36-44	Silt loam	CL	A-6, A-7	0	0	94-100	91-100	82-100	64-90	28-44	10-22
	44-60	Silt loam	CL	A-6, A-7	0	0	94-100	91-100	82-100	64-90	28-44	10-22
Ko:												
Konza-----	0-6	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	41-51	21-29
	6-28	Silty clay	CH	A-7-6	0	0	100	100	95-100	80-95	61-71	37-45
	28-42	Silty clay	CH	A-7-6	0	0	100	100	95-100	85-95	51-61	29-37
	42-50	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	46-56	25-33
	50-70	Silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	51-61	29-37
	70-89	Clay	CH	A-7-6	0	0-5	93-100	91-100	82-100	68-95	61-81	37-53
Lm:												
Ladysmith-----	0-7	Silty clay loam	CL	A-7-6	0	0	100	100	95-100	85-95	44-51	23-29
	7-15	Silty clay	CH	A-7-6	0	0	100	100	90-100	75-95	56-76	33-49
	15-30	Clay	CH	A-7-6	0	0	100	100	90-100	75-95	56-76	33-49
	30-38	Clay	CH	A-7-6	0	0	100	100	90-100	75-95	56-76	33-49
	38-60	Silty clay	CH	A-7-6	0	0	100	100	95-100	85-95	51-71	29-45
Lo:												
Longford-----	0-11	Loam	CL	A-6	0	0	100	95-100	85-95	60-75	26-36	8-16
	11-16	Clay loam	CL	A-7-6	0	0	100	95-100	85-100	60-80	37-48	17-25
	16-46	Clay loam	CL	A-7-6	0	0	100	95-100	90-100	70-80	44-53	22-29
	46-54	Clay loam	CL	A-7-6, A-6	0	0	100	95-100	85-100	60-80	30-44	11-22
	54-60	Loam	CL	A-6, A-7-6	0	0	100	95-100	90-100	60-80	30-44	11-22
M-W:												
Miscellaneous	---	---	---	---	---	---	---	---	---	---	---	---
Water-----												
Mb:												
Mccook-----	0-16	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	16-25	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	25-60	Very fine sandy loam	CL, ML	A-4	0	0	100	97-100	81-100	48-90	21-28	NP-10
Mc:												
Mccook-----	0-16	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	16-25	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	25-60	Very fine sandy loam	CL, CL-ML, ML	A-4	0	0	100	97-100	81-100	48-90	21-28	NP-10
Mk:												
Mccook-----	0-12	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	12-23	Silt loam	CL	A-4	0	0	100	100	85-100	60-90	26-30	8-11
	23-60	Very fine sandy loam, silt loam	CL, ML, CL-ML	A-4	0	0	100	97-100	81-100	48-90	21-28	NP-10
Smokyhill-----	0-6	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	28-36	10-16
	6-14	Silty clay loam	CH	A-7	0	0	100	100	97-100	85-95	39-48	18-25
	14-30	Silty clay loam	CH	A-7-6	0	0	100	100	95-100	85-95	44-53	22-29
	30-72	Silt loam	CL, CL-ML	A-4	0	0	100	97-100	81-100	48-90	21-28	4-10
Mu:												
Muir-----	0-4	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	28-36	10-16
	4-16	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	28-36	10-16
	16-24	Silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-90	28-44	10-22
	24-44	Silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-90	28-44	10-22
	44-60	Silt loam	CL	A-6, A-7-6	0	0	100	100	90-100	70-90	28-44	10-22
Oc:												
Orthents-----	---	---	---	---	---	---	---	---	---	---	---	---
Or:												
Orthents, Earthen Dam---	---	---	---	---	---	---	---	---	---	---	---	---
Pt:												
Pits, Quarries-	0-60	Variable			---	---	---	---	---	---	---	---
Ra:												
Reading-----	0-8	Silt loam	CL	A-6	0	0	100	100	90-100	70-90	28-37	10-17
	8-20	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-39	16-18
	20-52	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	39-44	18-22
	52-60	Silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	39-48	18-25

ENGINEERING INDEX PROPERTIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct					Pct	
Re: Reading-----	In											
	0-8	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-39	16-18
	8-20	Silty clay loam	CL	A-6	0	0	100	100	95-100	85-95	36-39	16-18
	20-52	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-95	39-44	18-22
	52-60	Silty clay loam	CL	A-7, A-6	0	0	100	100	95-100	85-95	39-48	18-25
Sa: Sarpy-----	0-9	Loamy fine sand	SM	A-2-4	0	0	100	100	70-85	28-45	12-17	NP-1
	9-60	Fine sand	SM, SP-SM	A-2-4	0	0	100	100	50-85	5-45	12-17	NP-1
Sc: Sarpy-----	0-4	Gravelly loamy coarse sand	SM	A-2-4	0	0	72-92	60-82	30-62	9-25	14-17	NP-1
	4-10	Sand	SM	A-2-4	0	0	88-100	82-100	40-70	5-15	14-17	NP-1
	10-60	Coarse sand	SM	A-2-4	0	0	92-100	82-100	40-70	5-15	14-17	NP-1
Sh: Solomon-----	0-8	Silty clay	CH	A-7	0	0	100	100	95-100	90-95	56-71	33-45
	8-19	Silty clay	CH	A-7	0	0	100	100	95-100	90-95	56-71	33-45
	19-36	Clay	CH	A-7	0	0	100	100	90-100	75-95	56-71	33-45
	36-50	Clay	CH	A-7	0	0	100	100	90-100	75-95	56-71	33-45
	50-60	Clay	CH	A-7	0	0	100	100	90-100	75-95	56-71	33-45
St: Sutphen-----	0-6	Silty clay	CH	A-7	0	0	100	100	95-100	85-95	51-71	29-45
	6-11	Silty clay	CH	A-7	0	0	100	100	95-100	90-95	56-71	33-45
	11-21	Silty clay	CH	A-7	0	0	100	100	95-100	90-95	56-71	33-45
	21-30	Silty clay	CH	A-7	0	0	100	100	95-100	90-95	56-71	33-45
	30-40	Silty clay	CH	A-7	0	0	100	100	95-100	85-95	51-71	29-45
	40-60	Silty clay	CH	A-7	0	0	100	100	95-100	85-95	51-71	29-45
Tn: Tully-----	0-12	Silty clay loam	CL	A-6, A-7-6	0	0	93-100	91-100	86-100	77-95	37-46	17-24
	12-21	Silty clay loam	CL	A-6, A-7-6	0	0	93-100	91-100	86-100	77-95	39-48	18-25
	21-31	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	31-40	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	40-52	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	52-60	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	77-95	44-53	22-29
To: Tully-----	0-12	Silty clay loam	CL	A-6, A-7-6	0	0	93-100	91-100	86-100	77-95	37-46	17-24
	12-21	Silty clay loam	CL	A-6, A-7-6	0	0	93-100	91-100	86-100	77-95	39-48	18-25
	21-31	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	31-40	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	40-52	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	82-95	48-62	25-36
	52-60	Silty clay	CH, CL	A-7-6	0	0	93-100	91-100	86-100	77-95	44-53	22-29
Vc: Valentine-----	0-5	Loamy fine sand	SM, SP-SM	A-2	0	0	100	100	75-100	10-55	14-21	NP-4
	5-50	Loamy sand	SM	A-2	0	0	100	100	50-75	15-30	14-21	NP-4
	50-60	Sand	SM	A-2-4, A-3	0	0	100	100	50-70	5-15	12-17	NP-1
W: Water-----	---	---	---	---	---	---	---	---	---	---	---	---
We: Wells-----	0-12	Loam	CL	A-6	0	0	100	100	85-95	60-75	28-36	10-16
	12-19	Clay loam	CL	A-6, A-7	0	0	100	100	80-100	35-80	36-44	16-22
	19-37	Clay loam	CL	A-6, A-7	0	0	100	100	80-100	35-80	36-44	16-22
	37-51	Sandy clay loam	CL	A-6, A-7	0	0	100	100	80-90	35-55	36-44	16-22
	51-63	Clay loam	CL	A-4, A-6	0	0	100	100	90-100	60-80	26-39	8-18
Ortello-----	0-6	Sandy loam	SC, SM	A-4	0	0	100	100	60-70	30-40	17-26	1-8
	6-15	Sandy loam	SC, SM	A-4	0	0	100	100	60-70	30-40	17-26	1-8
	15-34	Sandy loam	ML, CL, CL-ML	A-4	0	0	100	100	60-85	30-55	17-26	1-8
	34-60	Sandy loam	ML, CL, CL-ML	A-4	0	0	100	100	60-85	30-55	17-26	1-8
Wf: Wells-----	0-12	Loam	CL	A-6	0	0	100	100	85-95	60-75	28-36	10-16
	12-19	Clay loam	CL	A-6, A-7	0	0	100	100	80-100	35-80	36-44	16-22
	19-37	Clay loam	CL	A-6, A-7	0	0	100	100	80-100	35-80	36-44	16-22
	37-51	Sandy clay loam	CL	A-7, A-6	0	0	100	100	80-90	35-55	36-44	16-22
	51-63	Clay loam	CL	A-4, A-6	0	0	100	100	90-100	60-80	26-39	8-18
Ortello-----	0-6	Sandy loam	SC, SM	A-4	0	0	100	100	60-70	30-40	17-26	1-8
	6-15	Sandy loam	SC, SM	A-4	0	0	100	100	60-70	30-40	17-26	1-8
	15-34	Sandy loam	ML, CL	A-4	0	0	100	100	60-85	30-55	17-26	1-8
	34-60	Sandy loam	ML, CL	A-4	0	0	100	100	60-85	30-55	17-26	1-8

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

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

Particle size is the effective diameter of a soil particle as measured by sedimentation, sieving, or micrometric methods. Particle sizes are expressed as classes with specific effective diameter class limits. The broad classes are sand, silt, and clay, ranging from the larger to the smaller.

Sand as a soil separate consists of mineral soil particles that are 0.05 millimeter to 2 millimeters in diameter. In this table, the estimated sand content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

Silt as a soil separate consists of mineral soil particles that are 0.002 to 0.05 millimeter in diameter. In this table, the estimated silt content of each soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

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

The content of sand, silt, and clay affects the physical behavior of a soil. Particle size is important for engineering and agronomic interpretations, for determination of soil hydrologic qualities, and for soil classification.

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

Moist bulk density is the weight of soil (oven-dry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3- or 1/10-bar (33kPa or 10kPa) moisture tension. Weight is determined after the soil is dried at 105 degrees C. In the table, the estimated moist bulk density of each soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. Depending on soil texture, a bulk density of more than 1.4 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

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

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

Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. It is an expression of the volume change between the water content of the clod at 1/3- or 1/10-bar tension (33kPa or 10kPa tension) and oven dryness. The volume change is reported in the table as percent change for the whole soil. Volume change is influenced by the amount and type of clay minerals in the soil.

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

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In Physical Properties table, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter. The content of organic matter in a soil can be maintained by returning crop residue to the soil. Organic matter has a positive effect on available water capacity, water infiltration, soil organism activity, and tilth. It is a source of nitrogen and other nutrients for crops and soil organisms.

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

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

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to

wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are as follows:

1. Coarse sands, sands, fine sands, and very fine sands.
2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, ash material, and sapric soil material.
3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams.
- 4L. Calcareous loams, silt loams, clay loams, and silty clay loams.
4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay.
5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material.
6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay.
7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material.
8. Soils that are not subject to wind erosion because of coarse fragments on the surface or because of surface wetness.

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

Explanation of Wind Erodibility Groups

Soil erodibility by wind is directly related to the percentage of dry non-erodible surface soil aggregates larger than 0.84 mm in diameter. From this percentage, the wind erodibility index (I-factor) is determined. The I-factor is an expression of the stability of these soil aggregates against breakdown by tillage and abrasion from wind erosion. Soils are placed in Wind Erodibility Groups (WEG) having similar percentages of dry soil aggregates larger than 0.84 mm as shown in the following table.

WEG	Properties of Soil Surface Layer	Dry Soil Aggregates >0.84mm Percent	Wind Erodibility Index T/Ac/Yr (I)
1	Very fine sand, fine sand, sand, or coarse sand	1 2 3 5 7	310 1/ 250 220 180 160
2	Loamy very fine sand, loamy fine sand, loamy sand, loamy coarse sand, organic soil materials.	10	134
3	Very fine sandy loam, fine sandy loam, sandy loam, or coarse sandy loam.	25	86
4	Clay, silty clay, non-calcareous clay loam, or silty clay loam with >35 percent clay content.	25	86
4L	Calcareous 2/ loam, silt loam, clay loam, or silty clay loam.	25	86
5	Non-calcareous loam and silt loam with <20 percent clay content, or sandy clay loam, sandy clay, and hemic 3/ organic soil materials.	40	56
6	Non-calcareous loam and silt loam with >20 percent clay content, or non-calcareous clay loam with <35 percent clay content.	45	48
7	Silt, non-calcareous silty clay loam with >35 percent clay content and fibric 3/ organic soil material.	50	38
8	Soils not suitable for cultivation due to coarse fragments or wetness; wind erosion is not a problem.	--	0

1/ The "I" values for WEG 1 vary from 160 for coarse sands to 310 for very fine sands. Use an "I" of 220 as an average figure. For coarser sand that has gravel, use a lower figure. For a soil that has no gravel and very fine sand, use a higher figure. (Modification for coarse fragments is preparation.)

2/ Calcareous is a strongly or violently effervescent reaction to cold dilute (1N) HCL.

3/ See Soil Taxonomy for definition.

PHYSICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas: Update

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
Be: Benfield-----	0-5 5-10 10-19 19-34 34-38 38-56	8 7 7 5 5	61 54 48 45 45	27-35 35-45 35-50 35-55 40-60	1.30-1.50 1.35-1.50 1.35-1.50 1.35-1.50 1.35-1.50	0.20-0.60 0.06-0.20 0.06-0.20 0.06-0.20 0.06-0.20	0.21-0.24 0.11-0.20 0.11-0.20 0.08-0.16 0.08-0.16	4.1-5.8 5.8-7.9 5.8-8.9 5.8-10.0 6.8-11.0	2.0-6.0 1.0-2.0 1.0-2.0 0.5-1.5 0.0-1.0	.37 .24 --- --- ---	.37 .37 --- --- ---	3	7	38
Florence-----	0-5 5-14 14-48 48-56 56-60	12 7 10 10	61 48 20-45 20-45	24-35 35-55 50-80 50-80	1.25-1.35 1.35-1.55 1.35-1.55 1.35-1.55	0.60-2.00 0.20-0.60 0.20-0.60 0.20-0.60	0.05-0.20 0.03-0.11 0.03-0.12 0.03-0.12	3.9-6.7 6.7-11.7 6.0-11.0 6.0-11.0	4.0-8.0 2.0-6.0 0.8-3.0 0.5-1.0	.15 .15 --- ---	.24 .24 --- ---	3	8	0
Cc: Cline-----	0-2 2-9 9-27 27-33 33-37	8 7 6 8	56 52 47 50	32-40 32-50 35-50 35-50	1.00-1.45 1.30-1.45 1.30-1.50 1.30-1.50	0.20-0.60 0.06-0.60 0.06-0.20 0.06-0.20	0.21-0.23 0.12-0.23 0.09-0.20 0.08-0.20	5.1-6.8 5.1-8.9 5.8-8.9 5.8-8.9	2.0-4.0 0.5-2.0 0.5-1.0 0.0-0.5	.24 .17 --- ---	.32 .28 --- ---	3	8	0
Cf: Cline-----	0-12 12-26 26-30 30-34	8 6 8	56 47 50	32-40 35-50 35-50	1.00-1.45 1.00-1.50 1.00-1.50	0.20-0.60 0.06-0.20 0.06-0.20	0.21-0.23 0.12-0.18 0.10-0.14	5.1-6.8 5.8-8.9 5.8-8.9	2.0-4.0 0.5-1.0 0.0-0.5	.24 .24 ---	.32 .28 ---	3	4	86
Sogn-----	0-9 9-13	20	49	27-35	1.35-1.45	0.60-2.00	0.21-0.23	4.1-5.8	1.0-3.0	.24	.32	1	4L	86
Cr: Crete-----	0-6 6-14 14-30 30-42 42-60	7 9 3 3 4	63 60 52 59 60	24-35 27-35 35-55 30-45 25-40	1.20-1.40 1.20-1.40 1.10-1.30 1.10-1.30 1.10-1.30	0.20-0.60 0.20-0.60 0.06-0.20 0.06-0.20 0.20-0.60	0.21-0.23 0.21-0.23 0.12-0.20 0.12-0.20 0.12-0.20	3.9-7.0 5.0-7.0 7.0-12.0 5.0-9.0 4.1-8.0	2.0-4.0 1.0-3.0 0.5-2.0 0.2-0.8 0.0-0.5	.37 .37 --- --- ---	.37 .37 --- --- ---	5	7	38
Cs: Crete-----	0-6 6-11 11-27 27-40 40-60	7 9 3 3 4	63 60 52 59 60	24-35 27-35 35-55 30-45 25-40	1.20-1.40 1.20-1.40 1.10-1.30 1.10-1.30 1.10-1.30	0.20-0.60 0.20-0.60 0.06-0.20 0.06-0.20 0.20-0.60	0.21-0.23 0.21-0.23 0.12-0.20 0.12-0.20 0.12-0.20	3.9-7.0 5.0-7.0 7.0-12.0 5.0-9.0 4.1-8.0	2.0-4.0 1.0-3.0 0.5-2.0 0.2-0.8 0.0-0.5	.37 .37 --- --- ---	.37 .37 --- --- ---	5	7	38
Ct: Crete-----	0-6 6-16 16-29 29-46 46-60	7 3 3 4 4	63 52 59 60 69	24-35 35-55 30-45 25-40 25-35	1.20-1.40 1.10-1.30 1.10-1.30 1.10-1.30 1.10-1.30	0.20-0.60 0.06-0.20 0.06-0.20 0.20-0.60 0.20-0.60	0.21-0.23 0.12-0.20 0.12-0.20 0.12-0.20 0.12-0.20	3.9-7.0 7.0-12.0 5.0-9.0 4.1-8.0 4.1-8.0	2.0-4.0 0.5-2.0 0.5-2.0 0.2-0.8 0.0-0.5	.37 .37 --- --- ---	.37 .37 --- --- ---	5	7	38
Eu: Eudora-----	0-7 7-14 14-19 19-26 26-60	12 14 21 22 63	69 73 69 70 29	10-20 10-20 5-18 5-18 5-18	1.00-1.50 1.20-1.50 1.20-1.50 1.30-1.50 1.30-1.50	0.60-2.00 0.60-2.00 0.60-2.00 2.00-6.00 2.00-6.00	0.20-0.24 0.20-0.24 0.20-0.22 0.14-0.22 0.14-0.22	0.5-2.6 0.5-2.6 0.0-2.2 0.0-2.2 0.0-2.2	1.0-3.0 1.0-3.0 0.0-2.0 0.0-1.0 0.0-0.5	.32 .32 --- --- ---	.32 .32 --- --- ---	5	5	56
Ge: Geary-----	0-8 8-18 18-25 25-48 48-60	11 9 7 26 26	68 64 59 42 44	15-27 20-32 27-38 27-38 20-35	1.12-1.40 1.12-1.40 1.35-1.50 1.35-1.50 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.20-0.22 0.15-0.20 0.15-0.20 0.15-0.20	1.6-4.1 2.6-5.1 4.1-6.4 4.1-6.4 2.6-5.8	1.0-4.0 1.0-3.0 1.0-2.0 0.5-1.5 0.5-1.0	.32 .32 --- --- ---	.32 .32 --- --- ---	5	6	48
Gf: Geary-----	0-6 6-10 10-16 16-38 38-60	11 9 7 7 26	68 64 59 61 47	15-27 20-32 27-38 27-38 20-35	1.12-1.40 1.12-1.40 1.35-1.50 1.35-1.50 1.35-1.50	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.20-0.22 0.15-0.20 0.15-0.20 0.15-0.20	1.6-4.1 2.6-5.1 4.1-6.4 4.1-6.4 2.6-5.8	1.0-4.0 1.0-3.0 1.0-2.0 0.5-1.5 0.5-1.0	.32 .32 --- --- ---	.32 .32 --- --- ---	5	6	48
He: Haynie-----	0-10 10-60	11 30-65	69 26	15-25 10-18	1.20-1.35 1.20-1.35	0.60-2.00 0.60-2.00	0.18-0.23 0.18-0.23	1.6-3.7 0.5-2.2	1.0-3.0 0.0-1.0	.32 .43	.32 .43	5	4L	86
Hf: Hobbs-----	0-8 8-24 24-44 44-60	11 11 10 10	68 68 68 68	15-27 15-27 15-30 15-30	1.20-1.40 1.20-1.40 1.20-1.40 1.20-1.40	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.21-0.24 0.00-0.20 0.18-0.22 0.18-0.22	1.6-4.1 1.6-4.1 1.6-4.7 1.6-4.7	2.0-4.0 0.5-1.0 0.5-1.0 0.5-1.0	.32 .32 --- ---	.32 .32 --- ---	5	6	48
Hg: Hobbs-----	0-8 8-24 24-44 44-60	11 11 10 10	68 68 68 68	15-27 15-27 15-30 15-30	1.20-1.40 1.20-1.40 1.20-1.40 1.20-1.40	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.21-0.24 0.00-0.20 0.18-0.22 0.18-0.22	1.6-4.1 1.6-4.1 1.6-4.7 1.6-4.7	2.0-4.0 0.5-1.0 0.5-1.0 0.5-1.0	.32 .32 --- ---	.32 .32 --- ---	5	6	48
Hm: Holder-----	0-8 8-14 14-45 45-58 58-60	11 9 7 7 10	68 64 61 66 68	15-27 15-30 28-35 15-30 15-30	1.40-1.60 1.40-1.60 1.20-1.40 1.40-1.60 1.40-1.60	0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00 0.60-2.00	0.22-0.24 0.22-0.24 0.18-0.20 0.20-0.22 0.20-0.22	1.6-4.1 1.6-4.7 4.3-5.8 1.6-4.7 1.6-4.7	1.0-4.0 1.0-3.0 0.8-2.0 0.5-1.5 0.1-0.5	.32 .32 --- --- ---	.32 .32 --- --- ---	5	6	48

PHYSICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas: Update

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
Ho: Holder-----	0-8	11	68	15-27	1.40-1.60	0.60-2.00	0.22-0.24	1.6-4.1	1.0-4.0	.32	.32	5	6	48
	8-14	9	64	15-30	1.40-1.60	0.60-2.00	0.22-0.24	1.6-4.7	1.0-3.0	.32	.32			
	14-45	7	61	28-35	1.20-1.40	0.60-2.00	0.18-0.20	4.3-5.8	0.8-2.0	---	---			
	45-58	9	64	15-30	1.40-1.60	0.60-2.00	0.20-0.22	1.6-4.7	0.5-1.5	---	---			
	58-60	10	68	15-30	1.40-1.60	0.60-2.00	0.20-0.22	1.6-4.7	0.1-0.5	---	---			
Id: Irwin-----	0-6	10	58	28-35	1.35-1.45	0.20-0.60	0.21-0.23	4.3-5.8	2.0-4.0	.37	.37	5	7	38
	6-13	10	58	28-35	1.35-1.45	0.20-0.60	0.21-0.23	4.3-5.8	1.5-3.0	.37	.37			
	13-30	5	35-45	40-60	1.40-1.50	0.00-0.06	0.10-0.13	6.8-11.0	0.8-2.0	---	---			
	30-41	5	35-45	40-60	1.40-1.50	0.00-0.06	0.10-0.13	6.8-11.0	0.2-1.0	---	---			
	41-72	7	48	35-50	1.40-1.50	0.06-0.20	0.09-0.19	5.8-10.0	0.2-0.8	---	---			
Ka: Kahola-----	0-24	10	68	18-27	1.35-1.40	0.60-2.00	0.21-0.24	2.2-4.1	2.0-4.0	.32	.32	5	6	48
	24-36	10	68	18-27	1.35-1.40	0.60-2.00	0.21-0.24	2.2-4.1	1.0-4.0	.32	.32			
	36-44	9	64	18-35	1.35-1.40	0.60-2.00	0.17-0.22	2.2-5.8	0.5-2.0	---	---			
	44-60	9	64	18-35	1.35-1.40	0.60-2.00	0.17-0.22	2.2-5.8	0.5-1.5	---	---			
Kb: Kahola-----	0-24	10	68	18-27	1.35-1.40	0.60-2.00	0.21-0.24	2.2-4.1	2.0-4.0	.32	.32	5	6	48
	24-36	10	68	18-27	1.35-1.40	0.60-2.00	0.21-0.24	2.2-4.1	1.0-4.0	.32	.32			
	36-44	9	64	18-35	1.35-1.40	0.60-2.00	0.17-0.22	2.2-5.8	0.5-2.0	---	---			
	44-60	9	64	18-35	1.35-1.40	0.60-2.00	0.17-0.22	2.2-5.8	0.5-1.5	---	---			
Ko: Konza-----	0-6	5	68	25-35	1.10-1.35	0.20-0.60	0.21-0.24	4.1-7.0	2.0-6.0	.37	.37	3	7	38
	6-28	2	48	45-55	1.10-1.40	0.00-0.06	0.09-0.13	9.0-12.0	1.0-3.0	.37	.37			
	28-42	3	57	35-45	1.10-1.50	0.06-0.20	0.11-0.20	7.0-9.0	0.5-1.0	---	---			
	42-50	3	62	30-40	1.10-1.50	0.06-0.20	0.18-0.20	5.0-8.0	0.2-0.8	---	---			
	50-70	4	56	35-45	1.30-1.50	0.06-0.20	0.11-0.20	7.0-9.0	0.1-0.8	---	---			
	70-89	5	40	45-65	1.30-1.50	0.00-0.06	0.08-0.12	9.0-14.0	0.0-0.5	---	---			
Lm: Ladysmith----	0-7	1-10	62	28-35	1.35-1.45	0.20-0.60	0.21-0.23	5.0-7.0	2.0-4.0	.37	.37	5	7	38
	7-15	1-10	45	40-60	1.35-1.50	0.00-0.06	0.10-0.15	8.0-13.0	1.0-3.0	.37	.37			
	15-30	1-10	45	40-60	1.35-1.50	0.00-0.06	0.10-0.15	8.0-13.0	1.0-3.0	---	---			
	30-38	1-10	45	40-60	1.35-1.50	0.00-0.06	0.10-0.15	8.0-13.0	1.0-3.0	---	---			
	38-60	1-10	48	35-55	1.40-1.60	0.00-0.20	0.10-0.19	7.0-12.0	0.0-1.0	---	---			
Lo: Longford-----	0-11	42	37	15-27	1.30-1.40	0.60-2.00	0.20-0.22	1.6-4.1	1.0-4.0	.28	.28	5	6	48
	11-16	34	36	28-40	1.35-1.50	0.20-0.60	0.14-0.20	4.9-7.9	1.0-2.0	.32	.32			
	16-46	30	20-47	35-40	1.35-1.50	0.06-0.20	0.14-0.20	5.8-7.9	0.5-2.0	---	---			
	46-54	34	33	20-35	1.30-1.40	0.20-0.60	0.15-0.20	2.6-5.8	0.5-1.0	---	---			
	54-60	38	36	20-35	1.30-1.40	0.20-0.60	0.15-0.20	2.6-5.8	0.5-1.0	---	---			
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---	---	---	---	---	-	---	---
Mb: Mccook-----	0-16	14	69	15-20	1.20-1.40	0.60-2.00	0.20-0.24	1.6-2.6	1.0-3.0	.32	.32	5	4L	86
	16-25	41	42	15-20	1.20-1.40	0.60-2.00	0.17-0.22	1.6-2.6	0.5-2.0	.32	.32			
	25-60	60	26	10-18	1.30-1.70	0.60-2.00	0.17-0.22	0.5-2.2	0.1-2.9	---	---			
Mc: Mccook-----	0-16	14	69	15-20	1.20-1.40	0.60-2.00	0.20-0.24	1.6-2.6	1.0-3.0	.32	.32	5	4L	86
	16-25	41	42	15-20	1.20-1.40	0.60-2.00	0.17-0.22	1.6-2.6	0.5-2.0	.32	.32			
	25-60	60	26	10-18	1.30-1.70	0.60-2.00	0.17-0.22	0.5-2.2	0.1-2.9	---	---			
Mk: Mccook-----	0-12	14	69	15-20	1.20-1.40	0.60-2.00	0.20-0.24	1.6-2.6	1.0-3.0	.32	.32	5	4L	86
	12-23	41	42	15-20	1.20-1.40	0.60-2.00	0.17-0.22	1.6-2.6	0.5-2.0	.32	.32			
	23-60	60	26	10-18	1.30-1.70	0.60-2.00	0.17-0.22	0.5-2.2	0.1-2.9	---	---			
Smokyhill----	0-6	25	53	18-27	1.20-1.30	0.60-2.00	0.22-0.24	2.2-4.1	2.0-4.0	.32	.32	5	4L	86
	6-14	18	48	30-40	1.10-1.30	0.20-0.60	0.12-0.20	4.7-6.8	1.0-2.0	.37	.37			
	14-30	3	57	35-45	1.10-1.50	0.06-0.20	0.11-0.20	5.8-7.0	0.5-1.0	---	---			
	30-72	60	26	10-18	1.30-1.70	0.60-2.00	0.17-0.22	0.0-2.2	0.1-2.0	---	---			
Mu: Muir-----	0-4	10	68	18-27	1.30-1.45	0.60-2.00	0.22-0.24	2.2-4.1	2.0-4.0	.32	.32	5	6	48
	4-16	10	68	18-27	1.30-1.45	0.60-2.00	0.22-0.24	2.2-4.1	2.0-4.0	.32	.32			
	16-24	9	64	18-35	1.30-1.50	0.60-2.00	0.18-0.22	2.2-5.8	1.0-3.0	---	---			
	24-44	9	64	18-35	1.30-1.50	0.60-2.00	0.18-0.22	2.2-5.8	1.0-3.0	---	---			
	44-60	9	64	18-35	1.30-1.50	0.60-2.00	0.18-0.22	2.2-5.8	0.0-0.5	---	---			
Oc: Orthents-----	---	---	---	---	---	---	---	---	---	---	---	5	4	86
Or: Orthents, Earthen Dam-	---	---	---	---	---	---	---	---	---	---	---	-	---	---
Pt: Pits, Quarries----	0-60	---	---	---	---	---	---	---	---	---	---	-	---	0
Ra: Reading-----	0-8	11	67	18-28	1.35-1.40	0.60-2.00	0.22-0.24	2.2-4.3	2.0-4.0	.32	.32	5	6	48
	8-20	7	64	27-30	1.35-1.40	0.20-0.60	0.21-0.23	3.0-4.7	2.0-4.0	.32	.32			
	20-52	7	61	30-35	1.40-1.50	0.20-0.60	0.18-0.20	4.7-5.8	0.5-3.0	---	---			
	52-60	8	56	30-40	1.40-1.50	0.20-0.60	0.13-0.20	4.7-6.8	0.5-1.0	---	---			
Re: Reading-----	0-8	7	64	27-30	1.35-1.40	0.20-0.60	0.21-0.23	3.0-4.7	2.0-4.0	.32	.32	5	7	38
	8-20	7	64	27-30	1.35-1.40	0.20-0.60	0.21-0.23	3.0-4.7	2.0-4.0	.32	.32			
	20-52	7	61	30-35	1.40-1.50	0.20-0.60	0.18-0.20	4.7-5.8	0.5-3.0	---	---			
	52-60	8	56	30-40	1.40-1.50	0.20-0.60	0.13-0.20	4.7-6.8	0.5-1.0	---	---			

PHYSICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas: Update

(Single entries under "Sand and Silt" are a representative percentage are calculated using an algorithm. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Wind erodibility index" apply only to the surface layer)

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Permea- bility (Ksat)	Available water capacity	Linear extensi- bility	Organic matter	Erosion factors			Wind erodi- bility group	Wind erodi- bility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Sa: Sarpy-----	0-9	80	16	2-5	1.30-1.70	5.95-19.98	0.10-0.12	0.0-0.0	0.5-1.0	.17	.17	5	2	134
	9-60	95	1	2-5	1.30-1.70	5.95-19.98	0.05-0.10	0.0-0.0	0.5-1.0	.15	.15			
Sc: Sarpy-----	0-4	79	17	2-5	1.30-1.70	5.95-19.98	0.04-0.06	0.0-0.0	0.5-1.0	.17	.24	5	2	134
	4-10	95	1	2-5	1.30-1.70	5.95-19.98	0.06-0.08	0.0-0.0	0.0-0.5	.15	.24			
	10-60	92	4	2-5	1.30-1.70	5.95-19.98	0.02-0.04	0.0-0.0	0.0-0.5	---	---			
Sh: Solomon-----	0-8	6	48	40-55	1.35-1.45	0.00-0.06	0.12-0.14	7.9-11.7	2.0-4.0	.28	.28	5	4L	86
	8-19	6	48	40-55	1.35-1.45	0.00-0.06	0.12-0.14	7.9-11.7	2.0-4.0	.28	.28			
	19-36	11	39	40-55	1.35-1.45	0.00-0.06	0.08-0.12	7.9-11.7	1.0-2.0	---	---			
	36-50	11	39	40-55	1.35-1.45	0.00-0.06	0.08-0.12	7.9-11.7	1.0-2.0	---	---			
	50-60	11	39	40-55	1.35-1.45	0.00-0.06	0.08-0.12	7.9-11.7	1.0-2.0	---	---			
St: Sutphen-----	0-6	6	47	35-55	1.35-1.45	0.00-0.06	0.12-0.14	6.7-11.7	2.0-4.0	.28	.28	5	4	86
	6-11	6	47	40-55	1.35-1.45	0.00-0.06	0.12-0.14	7.9-11.7	1.5-4.0	.28	.28			
	11-21	6	47	40-55	1.35-1.45	0.00-0.06	0.12-0.14	7.9-11.7	1.0-3.0	---	---			
	21-30	6	47	40-55	1.35-1.45	0.00-0.06	0.10-0.14	7.9-11.7	0.8-2.0	---	---			
	30-40	7	48	35-55	1.35-1.45	0.06-0.20	0.10-0.18	6.7-11.7	0.2-1.0	---	---			
	40-60	7	48	35-55	1.35-1.45	0.06-0.20	0.10-0.18	6.7-11.7	0.2-0.8	---	---			
Tn: Tully-----	0-12	10	57	28-38	1.35-1.45	0.20-0.60	0.21-0.23	4.3-6.4	3.0-6.0	.37	.37	5	7	38
	12-21	10	55	30-40	1.35-1.45	0.20-0.60	0.18-0.20	4.7-6.8	2.0-4.0	.37	.37			
	21-31	8	49	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	1.0-3.0	---	---			
	31-40	6	48	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	0.8-2.0	---	---			
	40-52	7	48	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	0.5-1.0	---	---			
	52-60	8	52	35-45	1.40-1.50	0.06-0.20	0.07-0.12	5.8-7.0	0.2-1.0	---	---			
To: Tully-----	0-12	10	57	28-38	1.35-1.45	0.20-0.60	0.21-0.23	4.3-6.4	3.0-6.0	.37	.37	5	7	38
	12-21	10	55	30-40	1.35-1.45	0.20-0.60	0.18-0.20	4.7-6.8	2.0-4.0	.37	.37			
	21-31	8	49	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	1.0-3.0	---	---			
	31-40	6	48	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	0.8-2.0	---	---			
	40-52	7	48	40-55	1.40-1.50	0.06-0.20	0.10-0.15	6.8-10.0	0.5-1.0	---	---			
	52-60	8	52	35-45	1.40-1.50	0.06-0.20	0.07-0.12	5.8-7.0	0.2-1.0	---	---			
Vc: Valentine----	0-5	87	7	2-10	1.70-1.90	5.95-19.98	0.07-0.12	0.0-0.0	0.5-1.0	.17	.17	5	2	134
	5-50	87	7	2-10	1.70-1.90	5.95-19.98	0.09-0.11	0.0-0.0	0.0-0.5	.17	.17			
	50-60	96	1	0-6	1.70-1.90	5.95-19.98	0.05-0.07	0.0-0.0	0.0-0.5	---	---			
W: Water-----	---			---	---	---	---	---	---	---	---	-	---	---
We: Wells-----	0-12	40	37	18-27	1.35-1.50	0.60-2.00	0.20-0.22	2.2-4.1	1.0-4.0	.28	.28	5	6	48
	12-19	35	34	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	.32	.32			
	19-37	35	34	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	---	---			
	37-51	55	14	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	---	---			
	51-63	38	42	15-30	1.35-1.50	0.60-2.00	0.15-0.19	1.6-4.7	0.5-1.0	---	---			
Ortello-----	0-6	67	23	5-15	1.40-1.60	2.00-6.00	0.13-0.18	0.0-1.6	1.0-2.0	.20	.20	4	3	86
	6-15	67	23	5-15	1.40-1.60	2.00-6.00	0.13-0.18	0.0-1.6	1.0-2.0	.20	.20			
	15-34	67	23	5-15	1.40-1.60	2.00-6.00	0.12-0.17	0.0-1.6	0.5-1.0	---	---			
	34-60	67	23	5-15	1.40-1.60	2.00-6.00	0.11-0.16	0.0-1.6	0.5-1.0	---	---			
Wf: Wells-----	0-12	40	37	18-27	1.35-1.50	0.60-2.00	0.20-0.22	2.2-4.1	1.0-4.0	.28	.28	5	6	48
	12-19	35	34	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	.32	.32			
	19-37	35	34	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	---	---			
	37-51	55	14	27-35	1.35-1.60	0.60-2.00	0.15-0.19	4.1-5.8	0.5-1.0	---	---			
	51-63	38	42	15-30	1.35-1.50	0.60-2.00	0.15-0.19	1.6-4.7	0.5-1.0	---	---			
Ortello-----	0-6	67	23	5-15	1.40-1.60	2.00-6.00	0.13-0.18	0.0-1.6	1.0-2.0	.20	.20	4	3	86
	6-15	67	23	5-15	1.40-1.60	2.00-6.00	0.13-0.18	0.0-1.6	1.0-2.0	.20	.20			
	15-34	67	23	5-15	1.40-1.60	2.00-6.00	0.12-0.17	0.0-1.6	0.5-1.0	---	---			
	34-60	67	23	5-15	1.40-1.60	2.00-6.00	0.11-0.16	0.0-1.6	0.5-1.0	---	---			

CHEMICAL PROPERTIES OF THE SOILS
Geary County, Kansas

The Chemical Properties table shows 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.

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

Effective cation-exchange capacity refers to the sum of extractable bases plus aluminum expressed in terms of milliequivalents per 100 grams of soil. It is determined for soils that have pH of less than 5.5.

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

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

Gypsum is expressed as a percent, by weight, of hydrated calcium sulfates in the fraction of the soil less than 20 millimeters in size. Gypsum is partially soluble in water and can be dissolved and removed by water. Soils that have a high content of gypsum may collapse if the gypsum is removed by percolating water.

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 soil if used as construction material, and the potential of the soil to corrode metal and concrete.

Sodium adsorption ratio (SAR) is a measure of the amount of sodium (Na) relative to calcium (Ca) and magnesium (Mg) in the water extract from saturated soil paste. It is the ratio of the Na concentration divided by the square root of one-half of the Ca + Mg concentration. Soils that have SAR values of 13 or more may be characterized by an increased dispersion of organic matter and clay particles, reduced permeability and aeration, and a general degradation of soil structure.

CHEMICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Be:								
Benfield-----	0-5	19-24	---	6.1-7.8	0	0	0	0
	5-10	24-30	---	6.6-8.4	0	0	0	0
	10-19	28-33	---	7.4-8.4	0	0	0	0
	19-34	28-36	---	7.4-8.4	0	0	0	0
	34-38	27-38	---	7.9-8.4	1-5	0	0	0
	38-56	---	---	---	---	---	---	---
Florence-----	0-5	20-28	---	5.6-7.3	0	0	0	0
	5-14	28-43	---	5.6-7.3	0	0	0	0
	14-48	43-62	---	6.1-7.8	0	0	0	0
	48-56	43-62	---	6.1-7.8	0-5	0	0	0
	56-60	---	---	---	---	---	---	---
Cc:								
Clime-----	0-2	22-27	---	6.6-8.4	1-15	0	0	0
	2-9	22-33	---	6.6-8.4	5-15	0	0	0
	9-27	24-33	---	7.4-8.4	10-35	0	0	0
	27-33	24-33	---	7.4-8.4	10-35	0	0	0
	33-37	---	---	---	---	---	---	---
Cf:								
Clime-----	0-12	22-27	---	6.6-8.4	1-15	0	0	0
	12-26	24-33	---	7.4-8.4	5-35	0	0	0
	26-30	24-33	---	7.4-8.4	10-35	0	0	0
	30-34	---	---	---	---	---	---	---
Sogn-----	0-9	19-24	---	6.1-8.4	0-5	0	0	0
	9-13	---	---	---	---	---	---	---
Cx:								
Crete-----	0-6	20-29	---	5.6-6.0	0	0	0	0
	6-14	22-29	---	5.6-6.0	0	0	0	0
	14-30	29-44	---	6.1-7.3	0	0	0	0
	30-42	25-36	---	6.1-7.3	0-5	0	0	0
	42-60	20-33	---	6.1-7.3	0-5	0	0	0
Cs:								
Crete-----	0-6	20-29	---	5.6-6.0	0	0	0	0
	6-11	22-29	---	5.6-6.0	0	0	0	0
	11-27	29-44	---	6.1-7.3	0	0	0	0
	27-40	25-36	---	6.1-7.3	0-5	0	0	0
	40-60	20-33	---	6.1-7.3	0-5	0	0	0
Ct:								
Crete-----	0-6	20-29	---	5.6-6.0	0	0	0	0
	6-16	29-44	---	6.1-7.3	0	0	0	0
	16-29	25-36	---	6.1-7.3	0-5	0	0	0
	29-46	20-33	---	6.1-7.3	0-5	0	0	0
	46-60	20-33	---	6.1-7.3	0-5	0	0	0
Eu:								
Eudora-----	0-7	8.9-15	---	5.1-7.8	0	0	0	0
	7-14	8.9-15	---	5.1-7.8	0	0	0	0
	14-19	9.0-14	---	5.1-7.8	0	0	0	0
	19-26	2.0-14	---	5.1-8.5	0-5	0	0	0
	26-60	2.0-14	---	5.1-8.5	0-5	0	0	0
Ge:								
Geary-----	0-8	12-19	---	5.6-6.5	0	0	0	0
	8-18	15-22	---	5.6-6.5	0	0	0	0
	18-25	19-26	---	5.6-8.4	0	0	0	0
	25-48	19-26	---	5.6-8.4	0	0	0	0
	48-60	15-24	---	5.6-8.4	0	0	0	0
Gf:								
Geary-----	0-6	12-19	---	5.6-6.5	0	0	0	0
	6-10	15-22	---	5.6-6.5	0	0	0	0
	10-16	19-26	---	5.6-8.4	0	0	0	0
	16-38	19-26	---	5.6-8.4	0	0	0	0
	38-60	15-24	---	5.6-8.4	0	0	0	0
He:								
Haynie-----	0-10	12-18	---	6.6-8.4	0-25	0	0	0
	10-60	8.9-14	---	7.4-8.4	5-30	0	0	0
Hf:								
Hobbs-----	0-8	12-19	---	6.1-7.8	0	0	0	0
	8-24	12-19	---	6.1-7.8	0	0	0	0
	24-44	12-21	---	6.1-7.8	0-5	0	0	0
	44-60	12-21	---	6.1-7.8	0-5	0	0	0
Hg:								
Hobbs-----	0-8	12-19	---	6.1-7.8	0	0	0	0
	8-24	12-19	---	6.1-7.8	0	0	0	0
	24-44	12-21	---	6.1-7.8	0-5	0	0	0
	44-60	12-21	---	6.1-7.8	0-5	0	0	0
Hm:								
Holder-----	0-8	12-19	---	5.1-7.3	0	0	0	0
	8-14	12-21	---	5.1-7.3	0	0	0	0
	14-45	20-24	---	6.1-7.8	0	0	0	0
	45-58	12-21	---	6.6-8.4	0-2	0	0	0
	58-60	12-21	---	6.6-8.4	0-5	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas

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Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Ho: Holder-----	0-8	12-19	---	5.1-7.3	0	0	0	0
	8-14	12-21	---	5.1-7.3	0	0	0	0
	14-45	20-24	---	6.1-7.8	0	0	0	0
	45-58	12-21	---	6.6-8.4	0-2	0	0	0
	58-60	12-21	---	6.6-8.4	0-5	0	0	0
Id: Irwin-----	0-6	20-24	---	5.6-7.3	0	0	0.0-2.0	0-2
	6-13	20-24	---	5.6-7.3	0	0	0.0-2.0	0-2
	13-30	27-38	---	5.6-8.4	0-3	0	2.0-4.0	2-8
	30-41	27-38	---	5.6-8.4	0-3	0	2.0-4.0	2-8
	41-72	28-36	---	6.6-8.4	0-3	0	2.0-4.0	2-8
Ka: Kahola-----	0-24	14-19	---	6.1-7.8	0	0	0	0
	24-36	14-19	---	6.1-7.8	0-3	0	0	0
	36-44	14-24	---	7.4-8.4	1-5	0	0	0
	44-60	14-24	---	7.4-8.4	1-5	0	0	0
Kb: Kahola-----	0-24	14-19	---	6.1-7.8	0	0	0	0
	24-36	14-19	---	6.1-7.8	0-3	0	0	0
	36-44	14-24	---	7.4-8.4	1-5	0	0	0
	44-60	14-24	---	7.4-8.4	1-5	0	0	0
Ko: Konza-----	0-6	20-29	---	5.6-7.3	0	0	0.0-2.0	0-2
	6-28	36-44	---	6.1-7.3	0	0	0.0-2.0	0-4
	28-42	29-36	---	7.4-8.4	0-2	0	0.0-2.0	0-6
	42-50	25-33	---	7.9-8.4	0-2	0-2	0.0-2.0	2-6
	50-70	29-36	---	7.4-8.4	0-5	0-2	0.0-2.0	4-10
	70-89	36-52	---	7.4-8.4	0-5	0-2	2.0-4.0	8-15
Lm: Ladysmith-----	0-7	23-29	---	5.6-7.3	0	0	0.0-2.0	0
	7-15	33-48	---	5.6-7.3	0	0	0.0-2.0	0
	15-30	33-48	---	5.6-7.8	0-2	0	0.0-2.0	0
	30-38	33-48	---	5.6-7.8	0-2	0	0.0-2.0	0
	38-60	29-44	---	7.4-8.4	0-2	0	0.0-2.0	0
Lo: Longford-----	0-11	12-19	---	5.6-7.3	0	0	0	0
	11-16	12-16	---	5.1-7.3	0	0	0	0
	16-46	14-18	---	5.1-7.3	0	0	0	0
	46-54	15-24	---	6.1-7.8	0	0	0	0
	54-60	15-24	---	6.1-7.8	0	0	0	0
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---	---
Mb: Mccook-----	0-16	10-15	---	6.6-8.4	0-3	0	0	0
	16-25	10-15	---	6.6-8.4	1-6	0	0	0
	25-60	7.0-14	---	6.6-8.4	3-10	0	0	0
Mc: Mccook-----	0-16	10-15	---	6.6-8.4	0-3	0	0	0
	16-25	10-15	---	6.6-8.4	1-6	0	0	0
	25-60	7.0-14	---	6.6-8.4	3-10	0	0	0
Mk: Mccook-----	0-12	10-15	---	6.6-8.4	0-3	0	0	0
	12-23	10-15	---	6.6-8.4	1-6	0	0	0
	23-60	7.0-14	---	6.6-8.4	3-10	0	0	0
Smokyhill-----	0-6	12-19	---	6.6-7.8	0-5	0	0	0
	6-14	19-27	---	6.6-7.8	0-5	0	0	0
	14-30	22-30	---	7.4-8.4	0-5	0	0	0
	30-72	7.0-14	---	7.4-8.4	0-5	0	0	0
Mu: Muir-----	0-4	12-19	---	5.6-7.3	0	0	0	0
	4-16	12-19	---	5.6-7.3	0	0	0	0
	16-24	12-24	---	6.1-7.3	0	0	0	0
	24-44	12-24	---	6.1-7.3	0-2	0	0	0
	44-60	12-24	---	6.1-8.4	0-2	0	0	0
Oc: Orthents-----	---	---	---	---	---	---	---	---
Or: Orthents, Earthen Dam----	---	---	---	---	---	---	---	---
Pt: Pits, Quarries--	0-60	---	---	---	---	---	---	---
Ra: Reading-----	0-8	12-20	---	5.6-6.5	0	0	0	0
	8-20	19-21	---	5.6-6.5	0	0	0	0
	20-52	10-24	---	5.6-6.5	0	0	0	0
	52-60	15-27	---	6.1-7.8	0	0	0	0
Re: Reading-----	0-8	15-21	---	5.6-6.5	0	0	0	0
	8-20	15-21	---	5.6-6.5	0	0	0	0
	20-52	19-24	---	5.6-6.5	0	0	0	0
	52-60	19-27	---	6.1-7.8	0	0	0	0

CHEMICAL PROPERTIES OF THE SOILS--Continued
Geary County, Kansas

PAGE 4 of 4

Map symbol and soil name	Depth	Cation- exchange capacity	Effective Cation Exchange Capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm		
Sa:								
Sarpy-----	0-9	2.0-5.0	---	6.6-8.4	0-2	0	0	0
	9-60	2.0-5.0	---	6.6-8.4	0-2	0	0	0
Sc:								
Sarpy-----	0-4	2.0-5.0	---	6.6-8.4	0	0	0	0
	4-10	2.0-5.0	---	7.4-8.4	0	0	0	0
	10-60	2.0-5.0	---	7.4-8.4	0	0	0	0
Sh:								
Solomon-----	0-8	32-43	---	7.4-8.4	1-4	0	0	0
	8-19	32-43	---	7.4-8.4	1-4	0	0	0
	19-36	32-43	---	7.9-9.0	1-4	0	0	0
	36-50	32-43	---	7.9-9.0	1-4	0	0	0
	50-60	32-43	---	7.9-9.0	1-4	0	0	0
St:								
Sutphen-----	0-6	28-43	---	6.1-8.4	0	0-3	0	0
	6-11	32-43	---	6.1-8.4	0	0-3	0	0
	11-21	32-43	---	6.1-8.4	0-3	0-3	0	0
	21-30	32-43	---	6.6-8.4	0-3	0-3	0	0
	30-40	28-43	---	7.4-8.4	1-3	0-3	0	0
	40-60	28-43	---	7.4-8.4	1-3	0-3	0	0
Tn:								
Tully-----	0-12	20-26	---	5.6-7.3	0	0	0	0
	12-21	19-27	---	5.6-7.3	0	0	0	0
	21-31	27-36	---	5.6-8.4	0-5	0	0	0
	31-40	27-36	---	5.6-8.4	0-5	0	0	0
	40-52	27-36	---	5.6-8.4	0-5	0	0	0
	52-60	22-30	---	6.6-8.4	0-5	0	0	0
To:								
Tully-----	0-12	20-26	---	5.6-7.3	0	0	0	0
	12-21	19-27	---	5.6-7.3	0	0	0	0
	21-31	27-36	---	5.6-8.4	0-5	0	0	0
	31-40	27-36	---	5.6-8.4	0-5	0	0	0
	40-52	27-36	---	5.6-8.4	0-5	0	0	0
	52-60	22-30	---	6.6-8.4	0-5	0	0	0
Vc:								
Valentine-----	0-5	2.0-10	---	5.6-7.3	0	0	0	0
	5-50	2.0-10	---	5.6-7.3	0	0	0	0
	50-60	0.0-6.0	---	5.6-7.3	0	0	0	0
W:								
Water-----	---	---	---	---	---	---	---	---
We:								
Wells-----	0-12	12-19	---	5.6-6.5	0	0	0	0
	12-19	19-24	---	5.6-7.3	0	0	0	0
	19-37	19-24	---	5.6-7.3	0	0	0	0
	37-51	19-24	---	5.6-7.3	0	0	0	0
	51-63	10-21	---	5.6-7.3	0	0	0	0
Ortello-----	0-6	5.0-12	---	5.6-7.3	0	0	0	0
	6-15	5.0-12	---	5.6-7.3	0	0	0	0
	15-34	5.0-12	---	6.1-7.3	0	0	0	0
	34-60	5.0-12	---	6.1-7.3	0	0	0	0
Wf:								
Wells-----	0-12	12-19	---	5.6-6.5	0	0	0	0
	12-19	19-24	---	5.6-7.3	0	0	0	0
	19-37	19-24	---	5.6-7.3	0	0	0	0
	37-51	19-24	---	5.6-7.3	0	0	0	0
	51-63	10-21	---	5.6-7.3	0	0	0	0
Ortello-----	0-6	5.0-12	---	5.6-7.3	0	0	0	0
	6-15	5.0-12	---	5.6-7.3	0	0	0	0
	15-34	5.0-12	---	6.1-7.3	0	0	0	0
	34-60	5.0-12	---	6.1-7.3	0	0	0	0

WATER FEATURES Geary County, Kansas

The Water Features table gives estimates of various water features. The estimates are used in land use planning that involves engineering considerations. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

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

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

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

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

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

Water table refers to a saturated zone in the soil. The Water Features table indicates, by month, depth to the top (upper limit) and base (lower limit) of the saturated zone in most years. Estimates of the upper and lower limits are based mainly on observations of the water table at selected sites and on evidence of a saturated zone, namely grayish colors or mottles (redoximorphic features) in the soil. A saturated zone that lasts for less than a month is not considered a water table. Ponding is standing water in a closed depression. Unless a drainage system is installed, the water is removed only by percolation, transpiration, or evaporation. The Water Features table indicates surface water depth and the duration and frequency of ponding. Duration is expressed as very brief if less than 2 days, brief if 2 to 7 days, long if 7 to 30 days, and very long if more than 30 days. Frequency is expressed as none, rare, occasional, and frequent. None means that ponding is not probable; rare that it is unlikely but possible under unusual weather conditions (the chance of ponding is nearly 0 percent to 5 percent in any year); occasional that it occurs, on the average, once or less in 2 years (the chance of ponding is 5 to 50 percent in any year); and frequent that it occurs, on the average, more than once in 2 years (the chance of ponding is more than 50 percent in any year).

Flooding, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt is not considered flooding, and water standing in swamps and marshes is considered ponding rather than flooding.

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

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

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

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

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
			Ft	Ft	Ft				
Be: Benfield-----	C		---	---	---	---	---	---	---
Florence-----	C		---	---	---	---	---	---	---
Cc: Cline-----	C		---	---	---	---	---	---	---
Cf: Cline-----	C		---	---	---	---	---	---	---
Sogn-----	D		---	---	---	---	---	---	---
Cr: Crete-----	C		---	---	---	---	---	---	---
Cs: Crete-----	C		---	---	---	---	---	---	---
Ct: Crete-----	C		---	---	---	---	---	---	---
Eu: Eudora-----	B		---	---	---	---	---	---	---
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Ge: Geary-----	B		---	---	---	---	---	---	---
Gf: Geary-----	B		---	---	---	---	---	---	---
He: Haynie-----	B		---	---	---	---	---	---	---
		April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
Hf: Hobbs-----	B		---	---	---	---	None	Brief	Frequent
		April	---	---	---	---	None	Brief	Frequent
		May	---	---	---	---	None	Brief	Frequent
		June	---	---	---	---	None	Brief	Frequent
		July	---	---	---	---	None	Brief	Frequent
		August	---	---	---	---	None	Brief	Frequent
		September	---	---	---	---	None	Brief	Frequent
		October	---	---	---	---	None	Brief	Frequent
Hg: Hobbs-----	B		---	---	---	---	None	Brief	Occasional
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
Hm: Holder-----	B		---	---	---	---	---	---	---
Ho: Holder-----	B		---	---	---	---	---	---	---
Id: Irwin-----	D		---	---	---	---	---	---	---
Ka:			---	---	---	---	---	---	---

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

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Kahola-----	B	January	---	---	---	---	None	---	Rare
		February	---	---	---	---	None	---	Rare
		March	---	---	---	---	None	---	Rare
		April	---	---	---	---	None	Very brief	Frequent
		May	---	---	---	---	None	Very brief	Frequent
		June	---	---	---	---	None	Very brief	Frequent
		July	---	---	---	---	None	Very brief	Frequent
		August	---	---	---	---	None	Very brief	Frequent
		September	---	---	---	---	None	Very brief	Frequent
		October	---	---	---	---	None	Very brief	Frequent
		November	---	---	---	---	None	---	Rare
		December	---	---	---	---	None	---	Rare
Kb: Kahola-----	B	January	---	---	---	---	None	---	Rare
		February	---	---	---	---	None	---	Rare
		March	---	---	---	---	None	---	Rare
		April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
		November	---	---	---	---	None	---	Rare
		December	---	---	---	---	None	---	Rare
Ko: Konza-----	D		---	---	---	---	---	---	---
Lm: Ladysmith-----	D		---	---	---	---	---	---	---
Lo: Longford-----	C		---	---	---	---	---	---	---
M-W: Miscellaneous Water-----	---		---	---	---	---	---	---	---
Mb: Mccook-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Mc: Mccook-----	B	April	---	---	---	---	None	Very brief	Rare
		May	---	---	---	---	None	Very brief	Rare
		June	---	---	---	---	None	Very brief	Rare
		July	---	---	---	---	None	Very brief	Rare
		August	---	---	---	---	None	Very brief	Rare
		September	---	---	---	---	None	Very brief	Rare
		October	---	---	---	---	None	Very brief	Rare
Mk: Mccook-----	B	April	---	---	---	---	None	Very brief	Occasional
		May	---	---	---	---	None	Very brief	Occasional
		June	---	---	---	---	None	Very brief	Occasional
		July	---	---	---	---	None	Very brief	Occasional
		August	---	---	---	---	None	Very brief	Occasional
		September	---	---	---	---	None	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Smokyhill-----	C	April	---	---	0.5-1.6	Brief	Rare	Brief	Occasional
		May	---	---	0.5-1.6	Brief	Rare	Brief	Occasional
		June	---	---	0.5-1.6	Brief	Rare	Brief	Occasional
		July	---	---	0.5-1.6	Brief	Rare	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
Mu: Muir-----	B	April	---	---	---	---	None	Brief	Rare
		May	---	---	---	---	None	Brief	Rare
		June	---	---	---	---	None	Brief	Rare
		July	---	---	---	---	None	Brief	Rare
		August	---	---	---	---	None	Brief	Rare
		September	---	---	---	---	None	Brief	Rare
		October	---	---	---	---	None	Brief	Rare
Oc:									

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

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Orthents-----	D		Ft	Ft	Ft				
Or:			---	---	---	---	---	---	---
Orthents, Earthen Dam----	---		---	---	---	---	---	---	---
Pt:			---	---	---	---	---	---	---
Pits, Quarries-----	---		---	---	---	---	---	---	---
Ra:			---	---	---	---	---	---	---
Reading-----	B		---	---	---	---	---	---	---
		March	---	---	---	---	None	---	Rare
		April	---	---	---	---	None	---	Rare
		May	---	---	---	---	None	---	Rare
		June	---	---	---	---	None	---	Rare
		July	---	---	---	---	None	---	Rare
		August	---	---	---	---	None	---	Rare
		September	---	---	---	---	None	---	Rare
		October	---	---	---	---	None	---	Rare
		November	---	---	---	---	None	---	Rare
Re:			---	---	---	---	---	---	---
Reading-----	B		---	---	---	---	---	---	---
		March	---	---	---	---	None	---	Rare
		April	---	---	---	---	None	---	Rare
		May	---	---	---	---	None	---	Rare
		June	---	---	---	---	None	---	Rare
		July	---	---	---	---	None	---	Rare
		August	---	---	---	---	None	---	Rare
		September	---	---	---	---	None	---	Rare
		October	---	---	---	---	None	---	Rare
		November	---	---	---	---	None	---	Rare
Sa:			---	---	---	---	---	---	---
Sarpy-----	A		---	---	---	---	---	---	---
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
Sc:			---	---	---	---	---	---	---
Sarpy-----	A		---	---	---	---	---	---	---
		April	---	---	---	---	None	Brief	Occasional
		May	---	---	---	---	None	Brief	Occasional
		June	---	---	---	---	None	Brief	Occasional
		July	---	---	---	---	None	Brief	Occasional
		August	---	---	---	---	None	Brief	Occasional
		September	---	---	---	---	None	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
Sh:			---	---	---	---	---	---	---
Solomon-----	D		---	---	---	---	---	---	---
		March	---	---	0.5-1.6	Long	Occasional	---	None
		April	---	---	0.5-1.6	Long	Frequent	Brief	Occasional
		May	---	---	0.5-1.6	Long	Frequent	Brief	Occasional
		June	---	---	0.5-1.6	Long	Occasional	Brief	Occasional
		July	---	---	0.5-1.6	Long	Occasional	Brief	Occasional
		August	---	---	0.5-1.6	Long	Rare	Brief	Occasional
		September	---	---	0.5-1.6	Long	Rare	Brief	Occasional
		October	---	---	---	---	None	Brief	Occasional
St:			---	---	---	---	---	---	---
Sutphen-----	D		---	---	---	---	---	---	---
		March	---	---	0.0-1.0	Brief	Rare	---	None
		April	---	---	0.0-1.0	Brief	Occasional	Very brief	Occasional
		May	---	---	0.0-1.0	Brief	Occasional	Very brief	Occasional
		June	---	---	0.0-1.0	Brief	Occasional	Very brief	Occasional
		July	---	---	0.0-1.0	Brief	Occasional	Very brief	Occasional
		August	---	---	0.0-1.0	Brief	Rare	Very brief	Occasional
		September	---	---	0.0-1.0	Brief	Rare	Very brief	Occasional
		October	---	---	---	---	None	Very brief	Occasional
Tn:			---	---	---	---	---	---	---
Tully-----	C		---	---	---	---	---	---	---
To:			---	---	---	---	---	---	---
Tully-----	C		---	---	---	---	---	---	---
Vc:			---	---	---	---	---	---	---
Valentine-----	A		---	---	---	---	---	---	---
W:			---	---	---	---	---	---	---
Water-----	---		---	---	---	---	---	---	---
We:			---	---	---	---	---	---	---
Wells-----	B		---	---	---	---	---	---	---

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

Map symbol and soil name	Hydro- logic group	Month	Soil Saturation		Ponding			Flooding	
			Upper limit	Lower limit	Surface water depth	Duration	Frequency	Duration	Frequency
Ortello-----	B		Ft ---	Ft ---	Ft ---	---	---	---	---
Wf: Wells-----	B		---	---	---	---	---	---	---
Ortello-----	B		---	---	---	---	---	---	---

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

A restrictive layer is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers. The table indicates the hardness and thickness of the restrictive layer, both of which significantly affect the ease of excavation. Depth to top is the vertical distance from the soil surface to the upper boundary of the restrictive layer.

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

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

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

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

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In	In				
Be: Benfield-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Low	High	Low
Florence-----	40-60	Bedrock (lithic)	---	Indurated	Low	Moderate	Low
Cc: Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Low	High	Low
Cf: Clime-----	20-40	Bedrock (paralithic)	---	Moderately cemented	Low	High	Low
Sogn-----	4-20	Bedrock (lithic)	---	Strongly cemented	Moderate	Low	Low
Cr: Crete-----	---	---	---	---	Low	Moderate	Low
Cs: Crete-----	---	---	---	---	Low	Moderate	Low
Ct: Crete-----	---	---	---	---	Low	Moderate	Low
Eu: Eudora-----	---	---	---	---	High	Low	Low
Ge: Geary-----	---	---	---	---	Moderate	Low	Low
Gf: Geary-----	---	---	---	---	Moderate	Low	Low
He: Haynie-----	---	---	---	---	High	Low	Low
Hf: Hobbs-----	---	---	---	---	Moderate	Low	Low
Hg: Hobbs-----	---	---	---	---	Moderate	Low	Low
Hm: Holder-----	---	---	---	---	Moderate	Low	Low
Ho: Holder-----	---	---	---	---	Moderate	Low	Low
Id: Irwin-----	---	---	---	---	Moderate	High	Low
Ka: Kahola-----	---	---	---	---	Moderate	Low	Low
Kb: Kahola-----	---	---	---	---	Moderate	Low	Low
Ko: Konza-----	---	---	---	---	Moderate	High	Moderate
Lm: Ladysmith-----	---	---	---	---	Moderate	High	Low
Lo: Longford-----	---	---	---	---	Moderate	High	Low
M-W: Miscellaneous Water-----	---	---	---	---	---	---	---
Mb: Mccook-----	---	---	---	---	Moderate	Low	Low
Mc: Mccook-----	---	---	---	---	Moderate	Low	Low
Mk: Mccook-----	---	---	---	---	Moderate	Low	Low
Smokyhill-----	---	---	---	---	Low	High	Low
Mu: Muir-----	---	---	---	---	Moderate	Low	Moderate
Oc: Orthents-----	---	---	---	---	Low	High	Moderate
Or: Orthents, Earthen Dam----	---	---	---	---	---	---	---
Pt: Pits, Quarries--	---	---	---	---	---	---	---
Ra: Reading-----	---	---	---	---	Moderate	Moderate	Low
Re: Reading-----	---	---	---	---	Moderate	Moderate	Low
Sa: Sarpy-----	---	---	---	---	Low	Low	Low
Sc: Sarpy-----	---	---	---	---	Low	Low	Low
Sh: Solomon-----	---	---	---	---	Moderate	High	Low
St: Sutphen-----	---	---	---	---	Low	High	Low
Tn: Tully-----	---	---	---	---	Low	High	Low
To: Tully-----	---	---	---	---	Low	High	Low
Vc: Valentine-----	---	---	---	---	Low	Low	Low
W: Water-----	---	---	---	---	Low	---	---
We: Wells-----	---	---	---	---	Moderate	Low	Moderate
Ortello-----	---	---	---	---	Moderate	Moderate	Low

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
Wf:		In	In				
Wells-----	---	---	---	---	Moderate	Low	Moderate
Ortello-----	---	---	---	---	Moderate	Moderate	Low

WATER MANAGEMENT
Geary County, Kansas

The soils of the survey area are rated in the Water Management table according to limitations that affect their suitability for water management. Soils are rated for pond reservoir areas, drainage, irrigation, terraces and diversions, and grassed waterways. Restrictive features that affect each soil for the specified use is also provided in the table.

The ratings in the table are both verbal and numerical. Rating class terms indicate the extent to which the soils are limited by all of the soil features that affect the specified use. Not limited indicates that the soil has features that are very favorable for the specified use. Good performance and very low maintenance can be expected. Slightly limited indicates that the soil has features that are favorable for the specified use. The limitations are minor and can be easily overcome. Good performance and low maintenance can be expected. Moderately limited indicates that the soil has features that are moderately favorable for the specified use. The limitations can be overcome or minimized by special planning, design, or installation. Fair performance and moderate maintenance can be expected. Limited indicates that the soil has one or more features that are significant limitations for the specified use. The limitations can be overcome, but generally require special design, soil reclamation, or installation procedures that may result in additional expense. Fair performance and moderate to high maintenance can be expected. Very limited indicates that the soil has one or more features that are unfavorable for the specified use. The limitations generally cannot be overcome without major soil reclamation, special design, or expensive installation procedures. Poor performance and high maintenance can be expected.

Limitation class terms, such as very limited or limited, etc., limitation ratings, and numerical ratings are shown for each soil feature listed. As many as three soil features may be listed for each soil component if applicable. The overall limitation rating for the soil component is based on the most severe limitation.

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 this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

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

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

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, to a cemented pan, 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 ditch banks are affected by depth to bedrock or to a cemented pan, 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, sodium, and sulfur. 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 or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, 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 or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a very limited 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, which conduct surface water to outlets at a non-erosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts and sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

WATER MANAGEMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Be: Benfield-----	Limitation: deep to water	Limitation: percs slowly slope thin layer	Limitation: area reclaim erodes easily slope	Limitation: area reclaim erodes easily slope
Florence-----	Limitation: deep to water	Limitation: large stones slope droughty	Limitation: large stones slope	Limitation: large stones slope droughty
Cc: Clime-----	Limitation: deep to water	---	Limitation: percs slowly slope depth to rock	---
Cf: Clime-----	Limitation: deep to water	Limitation: percs slowly slope thin layer	Limitation: area reclaim erodes easily slope	Limitation: area reclaim erodes easily slope
Sogn-----	Limitation: deep to water	Limitation: slope thin layer	Limitation: area reclaim slope depth to rock	Limitation: area reclaim slope depth to rock
Cr: Crete-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Cs: Crete-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Ct: Crete-----	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily	Limitation: erodes easily percs slowly
Eu: Eudora-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Ge: Geary-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Gf: Geary-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily slope	Limitation: erodes easily slope
He: Haynie-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Hf: Hobbs-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Hg: Hobbs-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Hm: Holder-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Ho: Holder-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
Id: Irwin-----	Limitation: deep to water	Limitation: percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Ka: Kahola-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Kb: Kahola-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Ko: Konza-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Lm: Ladysmith-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
Lo: Longford-----	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly

WATER MANAGEMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Features affecting--			
	Drainage	Irrigation	Terraces and diversions	Grassed waterways
M-W: Miscellaneous Water-----	---	---	---	---
Mb: Mccook-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Mc: Mccook-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Mk: Mccook-----	Limitation: deep to water	Limitation: flooding	Limitation: erodes easily	Limitation: erodes easily
Smokyhill-----	Limitation: deep to water	Limitation: flooding percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Mu: Muir-----	Limitation: deep to water	Favorable	Favorable	Favorable
Oc: Orthents-----	Limitation: deep to water	Limitation: percs slowly slope droughty	Limitation: percs slowly	Limitation: percs slowly droughty
Or: Orthents, Earthen Dam----	---	---	---	---
Pt: Pits, Quarries--	---	---	---	---
Ra: Reading-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Re: Reading-----	Limitation: deep to water	Favorable	Limitation: erodes easily	Limitation: erodes easily
Sa: Sarpy-----	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
Sc: Sarpy-----	Limitation: deep to water	Limitation: fast intake droughty	Limitation: too sandy soil blowing	Limitation: droughty
Sh: Solomon-----	Limitation: flooding percs slowly	Limitation: slow intake wetness droughty	Limitation: percs slowly wetness	Limitation: percs slowly wetness droughty
St: Sutphen-----	Limitation: deep to water	Limitation: flooding percs slowly slow intake	Limitation: percs slowly	Limitation: percs slowly
Tn: Tully-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
To: Tully-----	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Vc: Valentine-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: rooting depth slope droughty
W: Water-----	---	---	---	---
We: Wells-----	Limitation: deep to water	Favorable	Favorable	Favorable
Ortello-----	Limitation: deep to water	Limitation: soil blowing	Limitation: too sandy soil blowing	Favorable
Wf: Wells-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Ortello-----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: too sandy soil blowing	Favorable

WATER MANAGEMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Somewhat limited Slope Depth to bedrock	0.08 0.02	Somewhat limited Hard to pack Thin layer	0.60 0.56	Very limited Deep to water	1.00
Florence-----	28	Somewhat limited Seepage Depth to bedrock	0.05 0.01	Somewhat limited Thin layer	0.01	Very limited Deep to water	1.00
Cc: Clime-----	75	Somewhat limited Slope Depth to bedrock	0.50 0.06	Somewhat limited Thin layer Hard to pack	0.77 0.43	Very limited Deep to water	1.00
Cf: Clime-----	60	Somewhat limited Depth to bedrock Slope	0.11 0.01	Somewhat limited Thin layer Hard to pack	0.86 0.39	Very limited Deep to water	1.00
Sogn-----	20	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Cr: Crete-----	90	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.60	Very limited Deep to water	1.00
Cs: Crete-----	90	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.60	Very limited Deep to water	1.00
Ct: Crete-----	90	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.42	Very limited Deep to water	1.00
Eu: Eudora-----	85	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.07	Very limited Deep to water	1.00
Ge: Geary-----	85	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.04	Very limited Deep to water	1.00
Gf: Geary-----	85	Somewhat limited Seepage Slope	0.70 0.00	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
He: Haynie-----	55	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.04	Very limited Deep to water	1.00
Hf: Hobbs-----	89	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Deep to water	1.00
Hg: Hobbs-----	89	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.84	Very limited Deep to water	1.00
Hm: Holder-----	95	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.10	Very limited Deep to water	1.00
Ho: Holder-----	75	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.10	Very limited Deep to water	1.00
Id: Irwin-----	85	Not limited		Somewhat limited Hard to pack	0.51	Very limited Deep to water	1.00
Ka: Kahola-----	75	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.61	Very limited Deep to water	1.00
Kb: Kahola-----	75	Somewhat limited		Somewhat limited		Very limited	

WATER MANAGEMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ko: Konza-----	85	Seepage	0.70	Piping	0.61	Deep to water	1.00
Lm: Ladysmith-----	90	Not limited		Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Lo: Longford-----	85	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.98	Very limited Deep to water	1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Very limited Deep to water	1.00
Mb: Mccook-----	85	Somewhat limited Seepage	0.70	Not rated		Not rated	
Mc: Mccook-----	85	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.05	Very limited Deep to water	1.00
Mk: Mccook-----	63	Somewhat limited Seepage	0.70	Very limited Piping Seepage	1.00 0.05	Very limited Deep to water	1.00
Smokyhill-----	25	Somewhat limited Seepage	0.70	Very limited Ponding Piping Seepage	1.00 0.87 0.05	Very limited Deep to water	1.00
Mu: Muir-----	94	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.56	Very limited Deep to water	1.00
Oc: Orthents-----	100	Very limited Seepage	1.00	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.01	Very limited Deep to water	1.00
Re: Reading-----	85	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.01	Very limited Deep to water	1.00
Sa: Sarpy-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Deep to water	1.00
Sc: Sarpy-----	90	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Deep to water	1.00
Sh: Solomon-----	85	Not limited		Very limited Hard to pack Ponding	1.00 1.00	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Pond Reservoir Area		Embankments, Dikes, and Levees		Excavated Ponds (Aquifer- fed)	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
St: Sutphen-----	80	Not limited		Very limited Ponding Hard to pack	1.00 0.98	Very limited Deep to water	1.00
Tn: Tully-----	85	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
To: Tully-----	85	Somewhat limited Seepage	0.05	Not limited		Very limited Deep to water	1.00
Vc: Valentine-----	85	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Deep to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.18	Very limited Deep to water	1.00
Ortello-----	30	Very limited Seepage	1.00	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Wf: Wells-----	50	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.18	Very limited Deep to water	1.00
Ortello-----	30	Very limited Seepage	1.00	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00

SANITARY FACILITIES
Geary County, Kansas

Sanitary Facilities

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

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

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

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

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

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

A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor. If the lagoon is to be uniformly deep throughout, the slope must be gentle enough and the soil material must be thick enough over bedrock or a cemented pan to make land smoothing practical.

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

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

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

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

SANITARY FACILITIES
Geary County, Kansas

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

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

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

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

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

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

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Florence-----	28	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 0.47 0.16	Very limited Slope Depth to hard bedrock	1.00 0.05
Cc: Clime-----	75	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 1.00
Cf: Clime-----	60	Very limited Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00 0.84	Very limited Depth to soft bedrock Slope	1.00 1.00
Sogn-----	20	Very limited Depth to bedrock	1.00	Very limited Depth to hard bedrock Slope	1.00 0.67
Cr: Crete-----	90	Very limited Restricted permeability	1.00	Not limited	
Cs: Crete-----	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.09
Ct: Crete-----	90	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
Eu: Eudora-----	85	Very limited Flooding	1.00	Very limited Flooding Seepage	1.00 1.00
Ge: Geary-----	85	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope Seepage	0.91 0.50
Gf: Geary-----	85	Somewhat limited Restricted permeability Slope	0.50 0.37	Very limited Slope Seepage	1.00 0.50
He: Haynie-----	55	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Hf: Hobbs-----	89	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Hg: Hobbs-----	89	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Hm: Holder-----	95	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage Slope	0.50 0.00
Ho: Holder-----	75	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope Seepage	0.67 0.50

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Id: Irwin-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.67
Ka: Kahola-----	75	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Kb: Kahola-----	75	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Ko: Konza-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Lm: Ladysmith-----	90	Very limited Restricted permeability	1.00	Not limited	
Lo: Longford-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
M-W: Miscellaneous Water-	100	Not rated		Not rated	
Mb: Mccook-----	85	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Mc: Mccook-----	85	Somewhat limited Restricted permeability Flooding	0.50 0.40	Somewhat limited Seepage Flooding	0.50 0.40
Mk: Mccook-----	63	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Smokyhill-----	25	Very limited Flooding Restricted permeability Ponding	1.00 1.00 1.00	Very limited Flooding Ponding Seepage	1.00 1.00 0.50
Mu: Muir-----	94	Somewhat limited Restricted permeability Flooding	0.50 0.40	Somewhat limited Seepage Flooding	0.50 0.40
Oc: Orthents-----	100	Not limited		Somewhat limited Slope	0.33
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated	
Ra: Reading-----	85	Very limited Restricted permeability Flooding	1.00 0.40	Somewhat limited Flooding	0.40
Re: Reading-----	85	Very limited Restricted permeability Flooding	1.00 0.40	Somewhat limited Flooding	0.40
Sa: Sarpy-----	90	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.00

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Septic tank absorption fields		Sewage lagoons	
		Rating class and limiting features	Value	Rating class and limiting features	Value
Sc: Sarpy-----	90	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Flooding Seepage Slope	1.00 1.00 0.00
Sh: Solomon-----	85	Very limited Flooding Restricted permeability Ponding	1.00 1.00 1.00	Very limited Flooding Ponding	1.00 1.00
St: Sutphen-----	80	Very limited Flooding Restricted permeability Ponding	1.00 1.00 1.00	Very limited Flooding Ponding	1.00 1.00
Tn: Tully-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.09
To: Tully-----	85	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.91
Vc: Valentine-----	85	Very limited Filtering capacity Slope	1.00 0.16	Very limited Seepage Slope	1.00 1.00
W: Water-----	100	Not rated		Not rated	
We: Wells-----	50	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage Slope	0.50 0.09
Ortello-----	30	Not limited		Very limited Seepage Slope	1.00 0.09
Wf: Wells-----	50	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope	0.91
Ortello-----	30	Not limited		Seepage Very limited Seepage Slope	0.50 1.00 0.91

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Depth to bedrock Too clayey Slope Seepage	1.00 1.00 1.00 1.00	Very limited Depth to bedrock Slope	1.00 1.00	Very limited Depth to bedrock Too clayey Hard to compact Slope	1.00 1.00 1.00 1.00
Florence-----	28	Very limited Depth to bedrock Too clayey Seepage Content of large stones Slope	1.00 1.00 1.00 1.00 0.21 0.16	Somewhat limited Slope Depth to bedrock	0.16 0.05	Very limited Too clayey Gravel content Content of large stones Slope Depth to bedrock	1.00 0.47 0.21 0.16 0.05
Cc: Clime-----	75	Very limited Slope Depth to bedrock Too clayey Seepage	1.00 1.00 1.00 1.00	Very limited Slope Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Slope Too clayey	1.00 1.00 1.00
Cf: Clime-----	60	Very limited Depth to bedrock Too clayey Seepage Slope	1.00 1.00 1.00 0.84	Very limited Depth to bedrock Slope	1.00 0.84	Very limited Depth to bedrock Too clayey Hard to compact Slope	1.00 1.00 1.00 0.84
Sogn-----	20	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey	1.00 0.50
Cr: Crete-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Cs: Crete-----	90	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Ct: Crete-----	90	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Eu: Eudora-----	85	Very limited Flooding Seepage	1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Somewhat limited Seepage	0.50
Ge: Geary-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Gf: Geary-----	85	Somewhat limited Too clayey Slope	0.50 0.37	Somewhat limited Slope	0.37	Somewhat limited Too clayey Slope	0.50 0.37
He: Haynie-----	55	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Hf: Hobbs-----	89	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Hg: Hobbs-----	89	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Hm: Holder-----	95	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ho: Holder-----	75	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Id: Irwin-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Ka: Kahola-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Kb: Kahola-----	75	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Ko: Konza-----	85	Somewhat limited Too clayey	0.50	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Lm: Ladysmith-----	90	Very limited		Not limited		Very limited	

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
		Too clayey	1.00			Too clayey Hard to compact	1.00 1.00
Lo: Longford-----	85	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Mc: Mccook-----	85	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Mk: Mccook-----	63	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Smokyhill-----	25	Very limited Flooding Ponding	1.00 1.00	Very limited Flooding Ponding	1.00 1.00	Very limited Ponding	1.00
Mu: Muir-----	94	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Oc: Orthents-----	100	Not limited		Not limited		Not limited	
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Somewhat limited Too clayey Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
Re: Reading-----	85	Somewhat limited Too clayey Flooding	0.50 0.40	Somewhat limited Flooding	0.40	Somewhat limited Too clayey	0.50
Sa: Sarpy-----	90	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
Sc: Sarpy-----	90	Very limited Flooding Seepage Too Sandy	1.00 1.00 1.00	Very limited Flooding Seepage	1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
Sh: Solomon-----	85	Very limited Flooding Too clayey Ponding	1.00 1.00 1.00	Very limited Flooding Ponding	1.00 1.00	Very limited Too clayey Hard to compact Ponding	1.00 1.00 1.00
St: Sutphen-----	80	Very limited Flooding Too clayey Ponding	1.00 1.00 1.00	Very limited Flooding Ponding	1.00 1.00	Very limited Too clayey Hard to compact Ponding	1.00 1.00 1.00
Tn: Tully-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
To: Tully-----	85	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Vc: Valentine-----	85	Very limited Seepage Too Sandy Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Seepage Too Sandy Slope	1.00 0.50 0.16
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ortello-----	30	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50

SANITARY FACILITIES--Continued
Geary County, Kansas

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

Map symbol and soil name	Pct of map unit	Trench sanitary landfill		Area sanitary landfill		Daily cover for landfill	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Wf: Wells-----	50	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ortello-----	30	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50

AGRICULTURAL WASTE MANAGEMENT
Geary County, Kansas

The nature of the soil is also important in the application of organic wastes and wastewater to land as fertilizers and irrigation; it is also important when the soil is used as a medium for treatment and disposal of these wastes. Favorable soil properties are required to prevent environmental damage.

The use of organic wastes and wastewater as production resources will result in energy conservation, prevent the waste of these important resources, and prevent problems associated with their disposal. Where disposal is the goal, and a maximum amount is disposed in a minimum area to hold costs to a minimum, risk of environmental damage is the principal constraint. Where the reuse goal is pursued, and a minimum amount is applied to a maximum area to obtain the greatest benefit, environmental damage is unlikely.

Interpretations developed for waste management may include ratings for (1) manure and food processing wastes; (2) municipal sewage sludge; (3) irrigation use of wastewater; or (4) treatment of wastewater by the slow rate process, overland flow process, or rapid infiltration process. If available, these should be located in this subsection.

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

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

The ratings in the tables are for waste management systems that not only dispose of and treat organic waste or wastewater but also are beneficial to crops (application of manure and food-processing waste, application of sewage sludge, and disposal of wastewater by irrigation) and for waste management systems that are designed only for the purpose of wastewater disposal and treatment (overland flow of wastewater, rapid infiltration of wastewater, and slow rate treatment of wastewater).

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

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

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

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

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

AGRICULTURAL WASTE MANAGEMENT
Geary County, Kansas

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

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

Disposal of wastewater by irrigation not only disposes of municipal wastewater and wastewater from food-processing plants, lagoons, and storage ponds but also can improve crop production by increasing the amount of water available to crops. The ratings in the table are based on the soil properties that affect the design, construction, management, and performance of the irrigation system. The properties that affect design and management include the sodium adsorption ratio, depth to a water table, ponding, available water capacity, permeability, slope, and flooding. The properties that affect construction include stones, cobbles, depth to bedrock or a cemented pan, depth to a water table, and ponding.

The properties that affect performance include depth to bedrock or a cemented pan, bulk density, the sodium adsorption ratio, salinity, reaction, and the cation-exchange capacity, which is used to estimate the capacity of a soil to adsorb heavy metals. Permanently frozen soils are not suitable for disposal of wastewater by irrigation.

See the National Soil Handbook, September 1992, Part 620, for criteria used in rating soils for sanitary facilities and waste management.

AGRICULTURAL WASTE MANAGEMENT--Continued
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Be: Benfield-----	42	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Too steep for surface application	1.00 1.00
		Droughty	0.01	Droughty	0.01	Too steep for sprinkler application	1.00
		Depth to bedrock	0.01	Depth to bedrock	0.01	Droughty Depth to bedrock	0.01 0.01
Florence-----	28	Somewhat limited Droughty	0.37	Somewhat limited Droughty	0.37	Very limited Too steep for surface application	1.00
		Restricted permeability	0.30	Restricted permeability	0.22	Too steep for sprinkler application	0.39
		Slope	0.16	Slope	0.16	Droughty Restricted permeability	0.37 0.22
Cc: Clime-----	75	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Too steep for surface application	1.00
		Restricted permeability	1.00	Restricted permeability	1.00	Too steep for sprinkler application	1.00
		Depth to bedrock	0.20	Depth to bedrock	0.20	Restricted permeability	1.00
		Droughty	0.10	Droughty	0.10	Depth to bedrock Droughty	0.20 0.10
Cf: Clime-----	60	Very limited Restricted permeability Slope	1.00 0.84	Very limited Restricted permeability Slope	1.00 0.84	Very limited Restricted permeability Too steep for surface application	1.00 1.00
		Depth to bedrock	0.46	Depth to bedrock	0.46	Too steep for sprinkler application	0.89
		Droughty	0.11	Droughty	0.11	Depth to bedrock Droughty	0.46 0.11
Sogn-----	20	Very limited Depth to bedrock Droughty Runoff limitation	1.00 1.00 0.40	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Droughty Depth to bedrock Too steep for surface application	1.00 1.00 0.31
Cr: Crete-----	90	Very limited Restricted permeability Too acid	1.00 0.11	Very limited Restricted permeability Too acid	1.00 0.42	Very limited Restricted permeability Too acid	1.00 0.42
Cs: Crete-----	90	Very limited Restricted permeability Too acid	1.00 0.11	Very limited Restricted permeability Too acid	1.00 0.42	Very limited Restricted permeability Too acid Too steep for surface application	1.00 0.42 0.00
Ct: Crete-----	90	Very limited Restricted permeability Too acid	1.00 0.11	Very limited Restricted permeability Too acid	1.00 0.42	Very limited Restricted permeability Too steep for surface application Too acid Too steep for sprinkler application	1.00 0.66 0.42 0.00
Eu: Eudora-----	85	Somewhat limited		Very limited		Somewhat limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Ge: Geary-----	85	Flooding	0.60	Flooding	1.00	Flooding	0.60
		Filtering capacity	0.00	Filtering capacity	0.00	Filtering capacity	0.00
		Somewhat limited		Somewhat limited		Somewhat limited	
		Too acid	0.05	Too acid	0.21	Too steep for surface application	0.66
Gf: Geary-----	85	Too acid		Too acid		Too acid	0.21
						Too steep for sprinkler application	0.00
		Somewhat limited		Somewhat limited		Very limited	
		Slope	0.37	Slope	0.37	Too steep for surface application	1.00
He: Haynie-----	55	Too acid	0.05	Too acid	0.21	Too steep for sprinkler application	0.59
						Too acid	0.21
		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Hf: Hobbs-----	89	Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Hg: Hobbs-----	89	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Hm: Holder-----	95	Somewhat limited		Somewhat limited		Somewhat limited	
		Too acid	0.22	Too acid	0.77	Too acid	0.77
Ho: Holder-----	75	Somewhat limited		Somewhat limited		Somewhat limited	
		Too acid	0.22	Too acid	0.77	Too acid	0.77
Id: Irwin-----	85	Too steep for surface application	0.31	Too steep for surface application	0.31	Too steep for surface application	0.31
		Very limited		Very limited		Very limited	
		Restricted		Restricted		Restricted	
		permeability	1.00	permeability	1.00	permeability	1.00
Ka: Kahola-----	75	Runoff limitation	0.40	Sodium content	0.08	Too steep for surface application	0.31
		Sodium content	0.08			Sodium content	0.08
		Very limited		Very limited		Very limited	
		Flooding	1.00	Flooding	1.00	Flooding	1.00
Kb: Kahola-----	75	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Ko: Konza-----	85	Very limited		Very limited		Very limited	
		Restricted		Restricted		Restricted	
		permeability	1.00	permeability	1.00	permeability	1.00
		Runoff limitation	0.40	Too acid	0.42	Too acid	0.42
		Too acid	0.11				
Lm: Ladysmith-----	90	Very limited		Very limited		Very limited	
		Restricted		Restricted		Restricted	
		permeability	1.00	permeability	1.00	permeability	1.00
		Runoff limitation	0.40				
Lo: Longford-----	85	Very limited		Very limited		Very limited	
		Restricted		Restricted		Restricted	
		permeability	1.00	permeability	1.00	permeability	1.00
M-W: Miscellaneous Water-	100	Not rated		Not rated		Not rated	
Mb: Mccook-----	85	Somewhat limited		Very limited		Somewhat limited	
		Flooding	0.60	Flooding	1.00	Flooding	0.60
Mc: Mccook-----	85	Not limited		Somewhat limited		Not limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
Mk: Mccook-----	63	Somewhat limited Flooding	0.60	Flooding	0.40	Somewhat limited Flooding	0.60
Smokyhill-----	25	Very limited Restricted permeability Ponding Flooding	1.00 1.00 1.00 0.60	Very limited Flooding Restricted permeability Ponding	1.00 1.00 1.00 1.00	Very limited Restricted permeability Ponding Flooding	1.00 1.00 1.00 0.60
Mu: Muir-----	94	Not limited		Somewhat limited Flooding	0.40	Not limited	
Oc: Orthents-----	100	Very limited Low adsorption Runoff limitation	1.00 0.40	Very limited Low adsorption	1.00	Very limited Low adsorption Too steep for surface application	1.00 0.08
Or: Orthents, Earthen Dam-----	100	Not rated		Not rated		Not rated	
Pt: Pits, Quarries-----	100	Not rated		Not rated		Not rated	
Ra: Reading-----	85	Somewhat limited Restricted permeability Too acid	0.30 0.03	Somewhat limited Flooding Restricted permeability Too acid	0.40 0.22 0.14	Somewhat limited Restricted permeability Too acid	0.22 0.14
Re: Reading-----	85	Somewhat limited Restricted permeability Too acid	0.30 0.03	Somewhat limited Flooding Restricted permeability Too acid	0.40 0.22 0.14	Somewhat limited Restricted permeability Too acid	0.22 0.14
Sa: Sarpy-----	90	Very limited Filtering capacity Flooding Leaching limitation Droughty	1.00 0.60 0.45 0.42	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.42	Very limited Filtering capacity Flooding Droughty	1.00 0.60 0.42
Sc: Sarpy-----	90	Very limited Droughty Filtering capacity Flooding Leaching limitation	1.00 1.00 0.60 0.45	Very limited Droughty Flooding Filtering capacity	1.00 1.00 1.00	Very limited Droughty Filtering capacity Flooding	1.00 1.00 0.60
Sh: Solomon-----	85	Very limited Restricted permeability Ponding Flooding Runoff limitation	1.00 1.00 0.60 0.40	Very limited Restricted permeability Flooding Ponding	1.00 1.00 1.00	Very limited Restricted permeability Ponding Flooding	1.00 1.00 0.60
St: Sutphen-----	80	Very limited Restricted permeability Ponding Flooding Runoff limitation	1.00 1.00 0.60 0.40	Very limited Restricted permeability Flooding Ponding	1.00 1.00 1.00	Very limited Restricted permeability Ponding Flooding	1.00 1.00 0.60
Tn: Tully-----	85	Very limited		Very limited		Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Geary County, Kansas

(The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation. The numbers in the value columns range from 0.00 to 1.00. The larger the value, the greater the potential limitation. See text for further explanation of ratings in this table.)

Map symbol and soil name	Pct of map unit	Application of manure and food- processing waste		Application of sewage sludge		Disposal of wastewater by irrigation	
		Rating class and limiting features	Value	Rating class and limiting features	Value	Rating class and limiting features	Value
To: Tully-----	85	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability Too steep for surface application	1.00 0.00
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability Too steep for surface application Too steep for sprinkler application	1.00 0.66 0.00
Vc: Valentine-----	85	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Too steep for surface application	1.00
		Leaching limitation	0.45	Slope	0.16	Filtering capacity	1.00
		Slope	0.16	Droughty	0.02	Too steep for sprinkler application	0.39
		Droughty	0.02			Droughty	0.02
W: Water-----	100	Not rated		Not rated		Not rated	
We: Wells-----	50	Somewhat limited Too acid	0.03	Somewhat limited Too acid	0.14	Somewhat limited Too acid Too steep for surface application	0.14 0.00
Ortello-----	30	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity Too steep for surface application	0.00 0.00
Wf: Wells-----	50	Somewhat limited Too acid	0.03	Somewhat limited Too acid	0.14	Somewhat limited Too steep for surface application Too acid Too steep for sprinkler application	0.66 0.14 0.00
Ortello-----	30	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00	Somewhat limited Too steep for surface application Filtering capacity Too steep for sprinkler application	0.66 0.00 0.00

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Geary County, Kansas: KS061

						SPISP II Ratings		
MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	Leaching	Solution	Adsorbed
						(SLP)	Runoff (SSRP)	Runoff (SARP)
Be 1	BENFIELD SICL 42%	C	0.37	5"	4.0%	L	H	H (s)
Be 2	FLORENCE GR-SIL 28%	C	0.15	5"	6.0%	L	H	I
Cc 1	CLIME SICL 75%	C	0.24	2"	3.0%	I	H	H (s)
Cf 1	CLIME SICL 60%	C	0.24	12"	3.0%	L	H	H (s)
Cf 2	SOGN SICL 20%	D	0.24	9"	2.0%	V	H	H (s)
Cr 1	CRETE SICL 90%	C	0.37	6"	3.0%	L	H	H
Cs 1	CRETE SICL 90%	C	0.37	6"	3.0%	L	H	H
Ct 1	CRETE SICL 90%	C	0.37	6"	3.0%	L	H	H
Eu 1	EUDORA SIL 85%	B	0.32	7"	2.0%	I	I	I
Ge 1	GEARY SIL 85%	B	0.32	8"	2.5%	I	I	I
Gf 1	GEARY SIL 85%	B	0.32	6"	2.5%	I	I	I
He 1	HAYNIE SIL 55%	B	0.32	10"	2.0%	I	I	I
Hf 1	HOBBS SIL 89%	B	0.32	8"	3.0%	I	I	I
Hg 1	HOBBS SIL 89%	B	0.32	8"	3.0%	I	I	I
Hm 1	HOLDER SIL 95%	B	0.32	8"	2.5%	I	I	I
Ho 1	HOLDER SIL 75%	B	0.32	8"	2.5%	I	I	I
Id 1	IRWIN SICL 85%	D	0.37	6"	3.0%	V	H	H
Ka 1	KAHOLA SIL 75%	B	0.32	24"	3.0%	L	I	I
Kb 1	KAHOLA SIL 75%	B	0.32	24"	3.0%	L	I	I
Ko 1	KONZA SICL 85%	D	0.37	6"	4.0%	V	H	H
Lm 1	LADYSMITH SICL 90%	D	0.37	7"	3.0%	V	H	H
Lo 1	LONGFORD L 85%	C	0.28	11"	2.5%	L	H	H
M-W 1	MISCELLANEOUS WATER 100%		0.00	0"	0.0%	?	?	?
Mb 1	MCCOOK SIL 85%	B	0.32	16"	2.0%	I	I	I
Mc 1	MCCOOK SIL 85%	B	0.32	16"	2.0%	I	I	I
Mk 1	MCCOOK SIL 63%	B	0.32	12"	2.0%	I	I	I
Mk 2	SMOKYHILL SIL 25%	C	0.32	6"	3.0%	L	H	H

WIN-PST SPISP II
SOIL SENSITIVITY TO PESTICIDE LOSS RATING REPORT

Soils Data Table: SOIL_KS Sort Order: MUSYM

Geary County, Kansas: KS061

Mu 1	MUIR SIL 94%	B	0.32	4"	3.0% I	I	I
Oc 1	ORTHENTS 100%	D	0.00	0"	0.0% V	H	L
Or 1	ORTHENTS, EARTHEN DAM 100%		0.00	0"	0.0% ?	?	?
Pt 1	Pits, quarries VAR 100%		0.00	60"	0.0% ?	?	?
Ra 1	READING SIL 85%	B	0.32	8"	3.0% I	I	I
Re 1	READING SICL 85%	B	0.32	8"	3.0% I	I	I
Sa 1	SARPY LFS 90%	A	0.17	9"	0.8% H	L	L
Sc 1	SARPY GR-LCOS 90%	A	0.17	4"	0.8% H	L	L
Sh 1	SOLOMON SIC 85%	D	0.28	8"	3.0% V	H	H
St 1	SUTPHEN SIC 80%	D	0.28	6"	3.0% V	H	H
Tn 1	TULLY SICL 85%	C	0.37	12"	4.5% L	H	H
To 1	TULLY SICL 85%	C	0.37	12"	4.5% L	H	H
Vc 1	VALENTINE LFS 85%	A	0.17	5"	0.8% H	L	L
W 1	WATER 100%		0.00	0"	0.0% ?	?	?
We 1	WELLS L 50%	B	0.28	12"	2.5% I	I	I
We 2	ORTELLO SL 30%	B	0.20	6"	1.5% H	I	I
Wf 1	WELLS L 50%	B	0.28	12"	2.5% I	I	I
Wf 2	ORTELLO SL 30%	B	0.20	6"	1.5% H	I	I

(.\REPORTS\SOILS.TXT generated on 12/12/01 at 12:11:15)

H -- High
I -- Intermediate
L -- Low
V -- Very Low

Conditions that affect ratings:

- m -- There are macropores in the surface horizon deeper than 24"
- w -- The high water table comes within 24" of the surface during the growing season
- s -- The field slope is greater than 15%

SPISP II S-Ratings:

- SLP -- Soil Leaching Potential
- SSRP -- Soil Solution Runoff Potential
- SARP -- Soil Adsorbed Runoff Potential

In this section, hydric soils are defined and described and the hydric soils in the survey area are listed. The three essential characteristics of wetlands are hydrophytic vegetation, hydric soils, and wetland hydrology (Cowardin and others, 1979; U.S. Army Corps of Engineers, 1987; National Research Council, 1995; Tiner, 1985). Criteria for each of the characteristics must be met for areas to be identified as wetlands. Undrained hydric soils that have natural vegetation should support a dominant population of ecological wetland plant species. Hydric soils that have been converted to other uses should be capable of being restored to wetlands.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). These soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 1995). These criteria are used to identify a phase of a soil series that normally is associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (USDA, 1999) and "Keys to Soil Taxonomy" (USDA, 1998) and in the "Soil Survey Manual" (USDA, 1993).

If soils are wet enough for a long enough period to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils in this survey area are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and others, 1996).

Hydric soils are identified by examining and describing the soil to a depth of about 20 inches. This depth may be greater if determination of an appropriate indicator so requires. It is always recommended that soils be excavated and described to the depth necessary for an understanding of the redoximorphic processes. Then, using the completed soil descriptions, soil scientists can compare the soil features required by each indicator and specify which indicators have been matched with the conditions observed in the soil. The soil can be identified as a hydric soil if at least one of the approved indicators is present.

Map units in the Hydric Soil Interpretations table meet the definition of hydric soils and, in addition, have at least one of the hydric soil indicators. This list can help in planning land uses; however, onsite investigation is recommended to determine the hydric soils on a specific site (National Research Council, 1995; Hurt and others, 1996).

Map units that are made up of hydric soils may have small areas, or inclusions, of nonhydric soils in the higher positions on the landform, and map units made up of nonhydric soils may have inclusions of hydric soils in the lower positions on the landform.

These map units, in general, do not meet the definition of hydric soils because they do not have one of the hydric soil indicators. A portion of these map units, however, may include hydric soils. Onsite investigation is recommended to determine whether hydric soils occur and the location of the included hydric soils.

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Geary County, Kansas

PAGE 2 of 6

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Be: BENFIELD-FLORENCE COMPLEX, 5 TO 30 PERCENT SLOPES	BENFIELD	No	hillslope	---	---	---	---
	FLORENCE	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	KONZA	No	ridge	---	---	---	---
	LABETTE	No	hillslope	---	---	---	---
	IRWIN	No	hillslope	---	---	---	---
	TULLY	No	hillslope	---	---	---	---
	KAHOLA	No	flood plain	---	---	---	---
	ROCK OUTCROP	---	---	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
Cc: CLIME SILTY CLAY LOAM, 20 TO 40 PERCENT SLOPES, VERY STONY	CLIME	No	hillslope	---	---	---	---
	TUTTLE	No	hillslope	---	---	---	---
	TULLY	No	hillslope	---	---	---	---
	ROCK OUTCROP	---	---	---	---	---	---
	KAHOLA	No	flood plain	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
Cf: CLIME-SOHN SILTY CLAY LOAMS, 5 TO 20 PERCENT SLOPES	CLIME	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	TULLY	No	hillslope	---	---	---	---
	IRWIN	No	hillslope	---	---	---	---
	TUTTLE	No	hillslope	---	---	---	---
	KAHOLA	No	flood plain	---	---	---	---
	KONZA	No	ridge	---	---	---	---
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
Cr: CRETE SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	CRETE	No	ridge	---	---	---	---
	HASTINGS HOLDER	No No	divide hillslope	---	---	---	---
Cs: CRETE SILTY CLAY LOAM, 1 TO 4 PERCENT SLOPES	CRETE	No	hillslope	---	---	---	---
	HASTINGS HOLDER	No No	divide hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
Ct: CRETE SILTY CLAY LOAM, 3 TO 8 PERCENT SLOPES	CRETE	No	hillslope	---	---	---	---
	HASTINGS HOLDER	No No	divide hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
Eu: EUDORA SILT LOAM, OCCASIONALLY FLOODED	EUDORA	No	flood plain	---	---	---	---
	MCCOOK	No	stream terrace	---	---	---	---
	SARPY	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
Ge: GEARY SILT LOAM, 3 TO 8 PERCENT SLOPES	GEARY	No	hillslope	---	---	---	---
	CRETE	No	hillslope	---	---	---	---
	HASTINGS	No	divide	---	---	---	---
	HOLDER	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
Geary County, Kansas

PAGE 3 of 6

All mapunits are displayed regardless of hydric status and are listed in alpha-numeric order by mapunit symbol. The "Hydric Soils Criteria" columns indicate the conditions that caused the mapunit component to be classified as "Hydric" or "Non-Hydric". These criteria are defined in "Hydric Soils of the United States" (USDA Miscellaneous Publication No. 1491, June, 1991). See the "Criteria for Hydric Soils" endnote to determine the meaning of these columns. Spot symbols are footnoted at the end of the table.

Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Gf: GEARY SILT LOAM, 7 TO 15 PERCENT SLOPES	GEARY	No	hillslope	---	---	---	---
	HOLDER	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	SOGN	No	hillslope	---	---	---	---
	He: HAYNIE SILT LOAM, FREQUENTLY FLOODED	No	flood plain	---	---	---	---
	Unnamed stratified soils (fine- silty)	No	flood plain	---	---	---	---
	Unnamed stratified soils (fine)	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
	Unnamed stratified soils (sandy)	No	flood plain	---	---	---	---
Hf: HOBBS SILT LOAM, CHANNELED	HOBBS	No	flood plain	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
	MUIR	No	flood plain	---	---	---	---
	CRETE	No	hillslope	---	---	---	---
	GEARY	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
	Hg: HOBBS SILT LOAM, OCCASIONALLY FLOODED	Unranked	---	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
	MUIR	No	flood plain	---	---	---	---
Hm: HOLDER SILT LOAM, 1 TO 3 PERCENT SLOPES	CRETE	No	hillslope	---	---	---	---
	GEARY	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
	Ho: HOLDER SILT LOAM, 3 TO 7 PERCENT SLOPES	No	hillslope	---	---	---	---
	CRETE	No	hillslope	---	---	---	---
	GEARY	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	Id: IRWIN SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	No	hillslope	---	---	---	---
	IRWIN	No	hillslope	---	---	---	---
Id: IRWIN SILTY CLAY LOAM, 3 TO 7 PERCENT SLOPES	KONZA	No	ridge	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	FLORENCE	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO

HYDRIC SOIL INTERPRETATIONS
HYDRIC SOILS LIST
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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Ka: KAHOLA SILT LOAM, CHANNELED	KAHOLA	No	flood plain	---	---	---	---
	TULLY	No	hillslope	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
Kb: KAHOLA SILT LOAM, OCCASIONALLY FLOODED	KAHOLA	No	flood plain	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
	TULLY	No	hillslope	---	---	---	---
	READING	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
Ko: KONZA SILTY CLAY LOAM, 1 TO 3 PERCENT SLOPES	KONZA	No	ridge	---	---	---	---
	IRWIN	No	hillslope	---	---	---	---
	LABETTE	No	hillslope	---	---	---	---
	LADYSMITH	No	ridge	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	FLORENCE	No	hillslope	---	---	---	---
Lm: LADYSMITH SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES	LADYSMITH	No	ridge	---	---	---	---
	KONZA	No	ridge	---	---	---	---
Lo: LONGFORD LOAM, 1 TO 3 PERCENT SLOPES	LONGFORD	No	hillslope	---	---	---	---
	CRETE	No	hillslope	---	---	---	---
	ORTELO	No	hillslope	---	---	---	---
	WELLS	No	hillslope	---	---	---	---
M-W: MISCELLANEOUS WATER	MISCELLANEOUS WATER	Unranked	---	---	---	---	---
Mb: MCCOOK SILT LOAM, OCCASIONALLY FLOODED	MCCOOK	No	stream terrace	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
	SMOKYHILL	No	depression, flood plain	---	---	---	---
	SOLOMON	Yes	ephemeral oxbow lake, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
Mc: MCCOOK SILT LOAM, RARELY FLOODED	MCCOOK	No	stream terrace	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
	SMOKYHILL	No	depression, flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
Mk: MCCOOK-SMOKYHILL SILT LOAMS, OCCASIONALLY FLOODED	MCCOOK	No	stream terrace	---	---	---	---
	SMOKYHILL	No	depression, flood plain	---	---	---	---
	MCCOOK sandy substratum	No	flood plain	---	---	---	---
	SUTPHEN	No	flood plain	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
Mu: MUIR SILT LOAM, RARELY FLOODED	MUIR	No	flood plain	---	---	---	---
	SUTPHEN UNNAMED HYDRIC SOIL (ponding)	No Yes	flood plain depression, flood plain	---	---	---	---
Oc: ORTHENTS	ORTHENTS	Unranked	---	---	---	---	---
	ORTHENTS, EARTHEN DAM	Unranked	---	---	---	---	---
Pt: PITS, QUARRIES	Pits, quarries	Unranked	---	---	---	---	---
Ra: READING SILT LOAM, 0 TO 1 PERCENT SLOPES	READING	No	flood plain	---	---	---	---
	TULLY KAHOLA	No No	hillslope flood plain	---	---	---	---
Re: READING SILTY CLAY LOAM, 0 TO 2 PERCENT SLOPES	READING	No	flood plain	---	---	---	---
	TULLY KAHOLA	No No	hillslope flood plain	---	---	---	---
Sa: SARPY LOAMY FINE SAND, 0 TO 4 PERCENT SLOPES	SARPY	No	flood plain	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
Sc: SARPY GRAVELLY LOAMY SAND, 0 TO 4 PERCENT SLOPES, OCCASIONALLY FLOODED	SARPY	No	flood plain	---	---	---	---
	EUDORA	No	flood plain	---	---	---	---
Sh: SOLOMON SILTY CLAY, OCCASIONALLY FLOODED	SOLOMON	Yes	ephemeral oxbow lake, flood plain	3	NO	NO	YES
	SUTPHEN MCCOOK	No No	flood plain stream terrace	---	---	---	---
St: SUTPHEN SILTY CLAY, OCCASIONALLY FLOODED	SUTPHEN	No	flood plain	---	---	---	---
	MUIR	No	flood plain	---	---	---	---
	MCCOOK	No	stream terrace	---	---	---	---
	SOLOMON	Yes	ephemeral oxbow lake, flood plain	3	NO	NO	YES
Tn: TULLY SILTY CLAY LOAM, 1 TO 4 PERCENT SLOPES	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
	TULLY	No	hillslope	---	---	---	---
	KAHOLA	No	flood plain	---	---	---	---
	READING	No	flood plain	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	FLORENCE	No	hillslope	---	---	---	---

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Map symbol and map unit name	Component	Hydric	Local landform	Hydric soils criteria			
				Hydric criteria code	Meets saturation criteria	Meets flooding criteria	Meets ponding criteria
To: TULLY SILTY CLAY LOAM, 3 TO 8 PERCENT SLOPES	TULLY	No	hillslope	---	---	---	---
	KAHOLA	No	flood plain	---	---	---	---
	READING	No	flood plain	---	---	---	---
	BENFIELD	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	FLORENCE	No	hillslope	---	---	---	---
	calcareous, fine-loamy, cumulic hapludolls	No	flood plain	---	---	---	---
Vc: VALENTINE LOAMY FINE SAND, 5 TO 15 PERCENT SLOPES	VALENTINE	No	dune	---	---	---	---
	ORTELLO	No	hillslope	---	---	---	---
	WELLS	No	hillslope	---	---	---	---
	LONGFORD	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	UNNAMED HYDRIC SOIL (ponding)	Yes	depression, flood plain	3	NO	NO	YES
	UNNAMED HYDRIC SOIL (saturation)	Yes	flood plain, marsh	2B3	YES	NO	NO
W: WATER	WATER	Yes	---	4,3	NO	YES	YES
We: WELLS-ORTELLO COMPLEX, 1 TO 4 PERCENT SLOPES	WELLS	No	hillslope	---	---	---	---
	ORTELLO	No	hillslope	---	---	---	---
	LONGFORD	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---
	CRETE	No	hillslope	---	---	---	---
	VALENTINE	No	dune	---	---	---	---
Wf: WELLS-ORTELLO COMPLEX, 4 TO 8 PERCENT SLOPES	WELLS	No	hillslope	---	---	---	---
	ORTELLO	No	hillslope	---	---	---	---
	LONGFORD	No	hillslope	---	---	---	---
	CLIME	No	hillslope	---	---	---	---

FOOTNOTE: There may be small areas of included soils or miscellaneous areas that are significant to use and management of the soil; yet are too small to delineate on the soil map at the map's original scale. These may be designated as spot symbols and are defined in the published Soil Survey Report or the USDA-NRCS Technical Guide, Part II.
Areas mapped as water or any map unit that contains one of the following conventional symbols is considered a hydric soil map unit: marshes or swamps; wet spots; depressions; streams, lakes and ponds.

1. All Histosols except Folists, or
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Aquisalids, Pachic subgroups, or Cumulic subgroups that are:
 - a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
 - b. poorly drained or very poorly drained and have either:
 - (1) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in), or for other soils
 - (2) water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or
 - (3) water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or
3. Soils that are frequently ponded for long duration or very long duration during the growing season, or
4. Soils that are frequently flooded for long duration or very long duration during the growing season.