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**County specific computer generated reports.*

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Harper County, Kansas: Maintenance needed

Map symbol	Soil name	Acres	Percent
007AE	Albion And Shellabarger Soils, 4 To 15 Percent Slopes-----	3,165	0.6
007AS	Clairemont Soils, Saline, Channeled-----	639	0.1
007FU	Farnum Clay Loam, 1 To 3 Percent Slopes, Eroded-----	6	*
007KA	Kanza Soils, Frequently Flooded-----	565	0.1
095AD	Albion Sandy Loam, 6 To 15 Percent Slopes-----	489	*
095DA	Dillwyn-Plevna Complex, Occasionally Flooded-----	661	0.1
095LA	Lincoln Loamy Sand, Occasionally Flooded-----	336	*
095NB	Nashville-Quinlan Complex, 5 To 15 Percent Slopes-----	175	*
095SA	Shellabarger Loamy Sand, 0 To 3 Percent Slopes-----	161	*
095SC	Shellabarger Sandy Loam, 3 To 6 Percent Slopes-----	165	*
095SD	Shellabarger Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	53	*
095ZA	Zenda Clay Loam, Occasionally Flooded-----	37	*
191EA	Elandco Silty Clay Loam, Rarely Flooded-----	210	*
191EC	Elandco Silt Loam, Frequently Flooded-----	131	*
191LS	Lincoln Soils, Frequently Flooded-----	123	*
191OP	Wellsford-Elandco Complex, 0 To 25 Percent Slopes-----	25	*
191PD	Pond Creek Silty Clay Loam, 2 To 6 Percent Slopes, Eroded-----	75	*
191RA	Renfrow-Grainola Complex, 1 To 3 Percent Slopes-----	12	*
191TA	Tabler Silty Clay Loam, 0 To 1 Percent Slopes-----	69	*
191US	Ustifluvents, Channeled-----	872	0.2
1439	Crisfield Sandy Loam, Rarely Flooded-----	22,025	4.3
An	Kaski Loam, Frequently Flooded-----	3,860	0.8
At	Attica Fine Sandy Loam, 1 To 3 Percent Slopes-----	1,440	0.3
Be	Bethany Silt Loam, 0 To 1 Percent Slopes-----	9,193	1.8
Bh	Bethany Silt Loam, 1 To 3 Percent Slopes-----	1,712	0.3
Bm	Lincoln Loamy Fine Sand, Occasionally Flooded-----	11,155	2.2
Bo	Gerlane Variant Loamy Fine Sand, Occasionally Flooded-----	1,576	0.3
Bp	Woodward-Port Complex, 0 To 20 Percent Slopes-----	25,586	5.0
Br	Fluvents, Frequently Flooded-----	721	0.1
Ca	Carwile Fine Sandy Loam, 0 To 1 Percent Slopes-----	1,336	0.3
Cc	Case-Clark Complex, 2 To 6 Percent Slopes-----	267	*
Ce	Corbin Silt Loam, 0 To 1 Percent Slopes-----	4,599	0.9
Cf	Corbin Silt Loam, 1 To 3 Percent Slopes-----	1,161	0.2
Fa	Farnum Clay Loam, 3 To 6 Percent Slopes, Eroded-----	1,283	0.2
Fm	Farnum Loam, 0 To 1 Percent Slopes-----	26,843	5.2
Fn	Farnum Loam, 1 To 3 Percent Slopes-----	20,055	3.9
Fu	Farnum Loam, 3 To 6 Percent Slopes-----	3,470	0.7
Ge	Gerlane Fine Sandy Loam, Occasionally Flooded-----	6,969	1.4
Gn	Grant Silt Loam, 0 To 1 Percent Slopes-----	5,693	1.1
Gr	Grant Silt Loam, 1 To 3 Percent Slopes-----	44,563	8.7
GRP	Gravel Pits-----	80	*
Gs	Grant Silt Loam, 3 To 6 Percent Slopes-----	6,083	1.2
INT	Aquolls-----	55	*
Ka	Kanza Loamy Fine Sand, Frequently Flooded-----	1,388	0.3
Kk	Kaski Loam, Occasionally Flooded-----	1,382	0.3
Km	Kirkland Silt Loam, 0 To 1 Percent Slopes-----	5,065	1.0
Kr	Kirkland-Renfrow Clay Loams, 1 To 3 Percent Slopes-----	17,984	3.5
Kw	Kirkland-Renfrow Soils, 1 To 3 Percent Slopes, Eroded-----	3,576	0.7
Mc	Minco Silt Loam, 0 To 1 Percent Slopes-----	487	*
Mn	Minco Silt Loam, 1 To 3 Percent Slopes-----	4,463	0.9
Mo	Minco Silt Loam, 3 To 6 Percent Slopes-----	1,031	0.2
Na	Nashville Silt Loam, 0 To 1 Percent Slopes-----	3,460	0.7
Ne	Nashville Silt Loam, 1 To 3 Percent Slopes-----	25,281	4.9
Nh	Nashville Silt Loam, 3 To 6 Percent Slopes-----	4,694	0.9
Nn	Nashville Silt Loam, 3 To 6 Percent Slopes, Eroded-----	7,071	1.4
No	Milan Loam, 1 To 3 Percent Slopes-----	8,737	1.7
Pc	Pond Creek Silt Loam, 0 To 1 Percent Slopes-----	16,218	3.2
Pd	Pond Creek Silt Loam, 1 To 3 Percent Slopes-----	23,063	4.5
Pe	Pond Creek Silt Loam, 3 To 6 Percent Slopes-----	827	0.2
Pg	Pond Creek Silt Loam, 3 To 6 Percent Slopes, Eroded-----	1,919	0.4
Ph	Dale Silt Loam, Rarely Flooded-----	19,944	3.9
Pk	Buttermilk Silt Loam, Rarely Flooded-----	4,281	0.8
Pm	Pratt Loamy Fine Sand, 3 To 8 Percent Slopes-----	5,262	1.0
Pn	Pratt Loamy Fine Sand, Siltstone Substratum, 3 To 8 Percent Slopes-----	2,197	0.4
Po	Pratt-Carwile Complex, 0 To 8 Percent Slopes-----	10,135	2.0
Pt	Pratt-Tivoli Loamy Fine Sands, 8 To 15 Percent Slopes-----	7,216	1.4
Qa	Quinlan Loam, 0 To 1 Percent Slopes-----	2,915	0.6
Qn	Quinlan Loam, 1 To 3 Percent Slopes-----	2,175	0.4
Qu	Quinlan Loam, 3 To 6 Percent Slopes-----	3,214	0.6
Rc	Renfrow-Vernon Clay Loams, 1 To 3 Percent Slopes-----	1,637	0.3
Re	Ruella Loam, 0 To 1 Percent Slopes-----	383	*
Rh	Ruella Loam, 1 To 3 Percent Slopes-----	3,004	0.6
Ru	Ruella Loam, 3 To 6 Percent Slopes-----	498	*
Sa	Lesho Clay Loam, Saline, Occasionally Flooded-----	587	0.1
Sb	Shellabarger Fine Sandy Loam, 0 To 1 Percent Slopes-----	3,320	0.6
Se	Shellabarger Fine Sandy Loam, 1 To 3 Percent Slopes-----	30,395	5.9
Sf	Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes-----	10,080	2.0
Sg	Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	4,249	0.8
Sh	Zellmont Sandy Loam, 1 To 3 Percent Slopes-----	4,620	0.9
SHH	Shellabarger Sandy Loam, 1 To 3 Percent Slopes-----	890	0.2
Sk	Zellmont Sandy Loam, 3 To 6 Percent Slopes-----	1,100	0.2
Sm	Zellmont Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	433	*
Sn	Shellabarger Loamy Fine Sand, 0 To 3 Percent Slopes-----	305	*
So	Shellabarger And Albion Soils, 7 To 15 Percent Slopes-----	6,286	1.2
Sp	Drummond Loam, 0 To 2 Percent Slopes-----	2,376	0.5
Ta	Tabler Clay Loam, 0 To 1 Percent Slopes-----	5,286	1.0
Th	Tivoli Fine Sand, 8 To 15 Percent Slopes-----	2,647	0.5
Vr	Vernon-Renfrow Complex, 2 To 6 Percent Slopes, Eroded-----	559	0.1
W	Water-----	541	0.1
Wa	Kingman Clay Loam, Occasionally Flooded-----	11,254	2.2
Wd	Woodward-Quinlan Loams, 0 To 1 Percent Slopes-----	5,443	1.1
We	Woodward-Quinlan Loams, 1 To 3 Percent Slopes-----	15,667	3.1

ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Harper County, Kansas: Maintenance needed

Map symbol	Soil name	Acres	Percent
Ww	Woodward-Quinlan Loams, 3 To 6 Percent Slopes-----	593	0.1
Za	Canadian Fine Sandy Loam, Rarely Flooded-----	3,241	0.6
Zf	Zenda Fine Sandy Loam, Occasionally Flooded-----	6,393	1.2
	Total-----	513,466	100.0

* Less than 0.1 percent.

NONTECHNICAL SOIL DESCRIPTIONS
Harper 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.

007AE Albion And Shellabarger Soils, 4 To 15 Percent Slopes

Albion soil makes up 55 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep paleoterrace on river valley. The runoff class is low. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderately 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 (pe20-25) range site. It is in the nonirrigated land capability classification 6e.

Shellabarger soil makes up 45 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep paleoterrace 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 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 (pe20-25) range site. It is in the nonirrigated land capability classification 6e.

007AS Clairemont Soils, Saline, Channeled

Clairemont soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat poorly drained. The slowest permeability is moderate. It has a moderate 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. This soil contains a moderately saline horizon. This soil is in the Saline Lowland (pe20-25) range site. It is in the nonirrigated land capability classification 6s.

007FU Farnum Clay Loam, 1 To 3 Percent Slopes, Eroded

Farnum soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a gently sloping paleoterrace on river valley. The runoff class is low. The parent material consists of alluvium. 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

007KA Kanza Soils, Frequently Flooded

Kanza soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is poorly drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

095AD Albion Sandy Loam, 6 To 15 Percent Slopes

Albion soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep paleoterrace on river valley. The runoff class is medium. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderately 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 (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

095DA Dillwyn-Plevna Complex, Occasionally Flooded

Dillwyn soil makes up 60 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level dune on paleoterrace on river valley, interdune on paleoterrace on river valley. The runoff class is negligible. The parent material consists of sandy eolian deposits. This soil is somewhat poorly 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 top of the seasonal high water table is at 24 inches. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 4w.

Plevna soil makes up 40 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is poorly drained. The slowest permeability is moderately rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

095LA Lincoln Loamy Sand, Occasionally Flooded

Lincoln soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat 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 top of the seasonal high water table is at 66 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sandy Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 6w.

095NB Nashville-Quinlan Complex, 5 To 15 Percent Slopes

Nashville soil makes up 60 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping hillslope on upland. The runoff class is high. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

Quinlan soil makes up 40 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping to moderately steep hillslope on upland. The runoff class is high. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

095SA Shellabarger Loamy Sand, 0 To 3 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping paleoterrace on river valley. The runoff class is very low. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderate. It has a moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

095SC Shellabarger Sandy Loam, 3 To 6 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

095SD Shellabarger Sandy Loam, 3 To 6 Percent Slopes, Eroded

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

095ZA Zenda Clay Loam, Occasionally Flooded

Zenda soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level dune on paleoterrace on river valley. The runoff class is very low. The parent material consists of sandy eolian deposits. This soil is somewhat poorly drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil contains a very slightly saline horizon. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 2w.

191EA Elandco Silty Clay Loam, Rarely Flooded

Elandco soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 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 Loamy Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 2w.

191EC Elandco Silt Loam, Frequently Flooded

Elandco soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 frequently 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 (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

191LS Lincoln Soils, Frequently Flooded

Lincoln soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat excessively drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 66 inches. This soil is in the Sandy Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 6w.

191OP Wellsford-Elandco Complex, 0 To 25 Percent Slopes

Wellsford soil makes up 65 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to steep hillslope on upland. The runoff class is very high. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is very slow. It has a very 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. This soil is in the Red Clay Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

Elandco soil makes up 35 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 frequently 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 (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

191PD Pond Creek Silty Clay Loam, 2 To 6 Percent Slopes, Eroded

Pond Creek soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping terrace. The runoff class is medium. The parent material consists of 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

191RA Renfrow-Grainola Complex, 1 To 3 Percent Slopes

Renfrow soil makes up 70 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Grainola soil makes up 30 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

191TA Tabler Silty Clay Loam, 0 To 1 Percent Slopes

Tabler soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level paleoterrace on river valley. The runoff class is negligible. The parent material consists of clayey alluvium. This soil is moderately well drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2s.

191US Ustifluvents, Channeled

Ustifluvents soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to steep flood plain. The runoff class is very high. The parent material consists of alluvium. This soil is . 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 .

1439 Crisfield Sandy Loam, Rarely Flooded

Crisfield soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is moderately well drained. The slowest permeability is moderately rapid. It has a low available water capacity and a low shrink swell potential. This soil is rarely flooded and is not ponded. The top of the seasonal high water table is at 40 inches. This soil is in the Sandy Terrace (pe24-32) range site. It is in the nonirrigated land capability classification 3s.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

An Kaski Loam, Frequently Flooded

Kaski soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping flood plain on river valley. The runoff class is very low. The parent material consists of alluvium. 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 frequently 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 (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

At Attica Fine Sandy Loam, 1 To 3 Percent Slopes

Attica soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a gently sloping dune on paleoterrace on river valley. The runoff class is very low. The parent material consists of eolian deposits. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Be Bethany Silt Loam, 0 To 1 Percent Slopes

Bethany soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level paleoterrace on upland. The runoff class is very low. The parent material consists of alluvium and/or loess over shale. 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 (pe24-32) range site. It is in the nonirrigated land capability classification 1.

Bh Bethany Silt Loam, 1 To 3 Percent Slopes

Bethany soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping paleoterrace on upland. The runoff class is low. The parent material consists of alluvium and/or loess over shale. 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Bm Lincoln Loamy Fine Sand, Occasionally Flooded

Lincoln soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat 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 top of the seasonal high water table is at 66 inches. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Sands (pe24-32) range site. It is in the nonirrigated land capability classification 4s.

Bo Gerlane Variant Loamy Fine Sand, Occasionally Flooded

Gerlane soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat excessively drained. The slowest permeability is slow. It has a low available water capacity and a high shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 60 inches. This soil contains a very slightly saline horizon. This soil is in the Sands (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

Bp Woodward-Port Complex, 0 To 20 Percent Slopes

Woodward soil makes up 65 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately steep hillslope on upland. The runoff class is high. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is somewhat excessively drained. The slowest permeability is moderate. 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

Port soil makes up 35 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is low. The parent material consists of alluvium. 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 frequently 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 (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

Br Fluvents, Frequently Flooded

Broken Alluvial Land soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to steep flood plain on river valley. The runoff class is high. The parent material consists of 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. It is in the nonirrigated land capability classification 6w.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

- Ca Carwile Fine Sandy Loam, 0 To 1 Percent Slopes
Carwile soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level depression on paleoterrace on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat poorly 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 top of the seasonal high water table is at 0 inches. This soil is in the Sandy (pe24-32) range site. It is in the nonirrigated land capability classification 2w.
- Cc Case-Clark Complex, 2 To 6 Percent Slopes
Case soil makes up 70 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping paleoterrace on river valley. The runoff class is low. The parent material consists of alluvium. 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. The soil contains a maximum amount of 25 percent calcium carbonate. This soil is in the Limy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.
- Clark soil makes up 30 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping paleoterrace 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 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 45 percent calcium carbonate. This soil is in the Limy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.
- Ce Corbin Silt Loam, 0 To 1 Percent Slopes
Corbin soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of 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 (pe24-32) range site. It is in the nonirrigated land capability classification 1.
- Cf Corbin Silt Loam, 1 To 3 Percent Slopes
Corbin soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.
- Fa Farnum Clay Loam, 3 To 6 Percent Slopes, Eroded
Farnum soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace on river valley. The runoff class is medium. The parent material consists of alluvium. 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 (pe24-32) range site. It is in the nonirrigated land capability classification 4e.
- Fm Farnum Loam, 0 To 1 Percent Slopes
Farnum soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level paleoterrace on river valley. The runoff class is very low. The parent material consists of alluvium. 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 (pe24-32) range site. This soil is in the irrigated land capability class 1 It is in the nonirrigated land capability classification 2c.
- Fn Farnum Loam, 1 To 3 Percent Slopes
Farnum soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a gently sloping paleoterrace on river valley. The runoff class is low. The parent material consists of alluvium. 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 (pe24-32) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.
- Fu Farnum Loam, 3 To 6 Percent Slopes
Farnum soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace on river valley. The runoff class is medium. The parent material consists of alluvium. 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Ge Gerlane Fine Sandy Loam, Occasionally Flooded

Gerlane soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace. The runoff class is very low. The parent material consists of alluvium. This soil is moderately well drained. The slowest permeability is moderately slow. It has a high available water capacity and a low shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 48 inches. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Gn Grant Silt Loam, 0 To 1 Percent Slopes

Grant soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace on upland. The runoff class is very low. The parent material consists of residuum. The soil is 40 to 60 inches deep to bedrock (paralithic). 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 1.

Gr Grant Silt Loam, 1 To 3 Percent Slopes

Grant soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping terrace on upland. The runoff class is low. The parent material consists of residuum. The soil is 40 to 60 inches deep to bedrock (paralithic). 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Gs Grant Silt Loam, 3 To 6 Percent Slopes

Grant soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping terrace on upland. The runoff class is medium. The parent material consists of residuum. The soil is 40 to 60 inches deep to bedrock (paralithic). 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

INT Aquolls

Aquolls soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level depression on terrace on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is very poorly drained. It has a very low available water capacity and a low shrink swell potential. This soil is not flooded and is occasional ponded. The top of the seasonal high water table is at 0 inches. It is in the nonirrigated land capability classification 5w.

Ka Kanza Loamy Fine Sand, Frequently Flooded

Kanza soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is poorly drained. The slowest permeability is rapid. It has a low available water capacity and a low shrink swell potential. This soil is frequently flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

Kk Kaski Loam, Occasionally Flooded

Kaski soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 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 Loamy Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 2w.

Km Kirkland Silt Loam, 0 To 1 Percent Slopes

Kirkland soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2s.

Kr Kirkland-Renfrow Clay Loams, 1 To 3 Percent Slopes

Kirkland soil makes up 70 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Renfrow soil makes up 30 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Kw Kirkland-Renfrow Soils, 1 To 3 Percent Slopes, Eroded

Kirkland soil makes up 70 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

Renfrow soil makes up 30 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Mc Minco Silt Loam, 0 To 1 Percent Slopes

Minco soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of eolian deposits. 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 1.

Mn Minco Silt Loam, 1 To 3 Percent Slopes

Minco soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is very low. The parent material consists of eolian deposits. 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Mo Minco Silt Loam, 3 To 6 Percent Slopes

Minco soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of eolian deposits. 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Na Nashville Silt Loam, 0 To 1 Percent Slopes

Nashville soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2s.

Ne Nashville Silt Loam, 1 To 3 Percent Slopes

Nashville soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Nh Nashville Silt Loam, 3 To 6 Percent Slopes

Nashville soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Nn Nashville Silt Loam, 3 To 6 Percent Slopes, Eroded

Nashville soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. It has a moderate 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 Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

No Milan Loam, 1 To 3 Percent Slopes

Norge soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of 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 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 (pe24-32) range site. This soil is in the irrigated land capability class 2e. It is in the nonirrigated land capability classification 2e.

Pc Pond Creek Silt Loam, 0 To 1 Percent Slopes

Pond Creek soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace. The runoff class is negligible. The parent material consists of 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 1.

Pd Pond Creek Silt Loam, 1 To 3 Percent Slopes

Pond Creek soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping terrace. The runoff class is low. The parent material consists of 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Pe Pond Creek Silt Loam, 3 To 6 Percent Slopes

Pond Creek soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping terrace. The runoff class is medium. The parent material consists of 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Pg Pond Creek Silt Loam, 3 To 6 Percent Slopes, Eroded

Pond Creek soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping terrace. The runoff class is medium. The parent material consists of 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Ph Dale Silt Loam, Rarely Flooded

Dale soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 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 5 percent calcium carbonate. This soil is in the Loamy Terrace (pe24-32) range site. It is in the nonirrigated land capability classification 1.

Pk Buttermilk Silt Loam, Rarely Flooded

Port soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level terrace on river valley. The runoff class is negligible. The parent material consists of alluvium. 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 rarely flooded and is not ponded. The top of the seasonal high water table is at 63 inches. The soil contains a maximum amount of 10 percent calcium carbonate. This soil contains a moderately saline horizon. This soil is in the Saline Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 3s.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Pm Pratt Loamy Fine Sand, 3 To 8 Percent Slopes

Pratt soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. This soil is well drained. The slowest permeability is rapid. It has a moderate 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 Sands (pe24-32) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Pn Pratt Loamy Fine Sand, Siltstone Substratum, 3 To 8 Percent Slopes

Pratt soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well 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 Sands (pe24-32) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Po Pratt-Carwile Complex, 0 To 8 Percent Slopes

Pratt soil makes up 65 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping to strongly sloping dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. This soil is well drained. The slowest permeability is rapid. It has a moderate available water capacity and a low shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 18 inches. This soil is in the Sands (pe24-32) range site. This soil is in the irrigated land capability class 3e. It is in the nonirrigated land capability classification 4e.

Carwile soil makes up 35 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level depression on paleoterrace on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat poorly 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 top of the seasonal high water table is at 0 inches. This soil is in the Sandy (pe24-32) range site. It is in the nonirrigated land capability classification 2w.

Pt Pratt-Tivoli Loamy Fine Sands, 8 To 15 Percent Slopes

Pratt soil makes up 50 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. This soil is well drained. The slowest permeability is rapid. It has a moderate 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 Sands (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

Tivoli soil makes up 50 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. 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 Sands (pe24-32) range site. It is in the nonirrigated land capability classification 7e.

Qa Quinlan Loam, 0 To 1 Percent Slopes

Quinlan soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Qn Quinlan Loam, 1 To 3 Percent Slopes

Quinlan soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Qu Quinlan Loam, 3 To 6 Percent Slopes

Quinlan soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Rc Renfrow-Vernon Clay Loams, 1 To 3 Percent Slopes

Renfrow soil makes up 65 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Vernon soil makes up 35 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is very 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 25 percent calcium carbonate. This soil contains a slightly saline horizon, it has a horizon that is moderately sodic. This soil is in the Red Clay Prairie (pe24-32) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 4e.

Re Ruella Loam, 0 To 1 Percent Slopes

Ruella soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of alluvium. The soil is 8 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2c.

Rh Ruella Loam, 1 To 3 Percent Slopes

Ruella soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of alluvium. The soil is 8 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Ru Ruella Loam, 3 To 6 Percent Slopes

Ruella soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of alluvium. The soil is 8 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Sa Lesho Clay Loam, Saline, Occasionally Flooded

Lesho soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is somewhat poorly drained. The slowest permeability is moderately slow. It has a moderate available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil contains a moderately saline horizon. This soil is in the Saline Subirrigated (pe24-32) range site. This soil is in the irrigated land capability class 4s. It is in the nonirrigated land capability classification 6s.

Sb Shellabarger Fine Sandy Loam, 0 To 1 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level paleoterrace on river valley. The runoff class is negligible. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderate. It has a moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Se Shellabarger Fine Sandy Loam, 1 To 3 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a gently sloping paleoterrace on river valley. The runoff class is very low. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderate. It has a moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Sf Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace 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 moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Sg Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes, Eroded

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a moderately sloping paleoterrace 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 moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Sh Zellmont Sandy Loam, 1 To 3 Percent Slopes

Zellmont soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping strath terrace on river valley. The runoff class is low. The parent material consists of loamy alluvium over residuum weathered from Permian shale. The soil is 20 to 39 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a 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 20 percent calcium carbonate. This soil is in the Sandy (pe21-28) range site. It is in the nonirrigated land capability classification 2e.

SHH Shellabarger Sandy Loam, 1 To 3 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a gently sloping paleoterrace on river valley. The runoff class is very low. The parent material consists of loamy 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 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 (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Sk Zellmont Sandy Loam, 3 To 6 Percent Slopes

Zellmont soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping strath terrace on river valley. The runoff class is low. The parent material consists of loamy alluvium over residuum weathered from Permian shale. The soil is 20 to 39 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a 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 20 percent calcium carbonate. This soil is in the Sandy (pe21-28) range site. It is in the nonirrigated land capability classification 3e.

Sm Zellmont Sandy Loam, 3 To 6 Percent Slopes, Eroded

Zellmont, eroded, soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping strath terrace on river valley. The runoff class is low. The parent material consists of loamy alluvium over residuum weathered from Permian shale. The soil is 20 to 39 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderately slow. It has a 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 20 percent calcium carbonate. This soil is in the Sandy (pe21-28) range site. It is in the nonirrigated land capability classification 3e.

Sn Shellabarger Loamy Fine Sand, 0 To 3 Percent Slopes

Shellabarger soil makes up 100 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a nearly level to gently sloping paleoterrace 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 moderate 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 Sands (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

So Shellabarger And Albion Soils, 7 To 15 Percent Slopes

Shellabarger soil makes up 70 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep paleoterrace on river valley. The runoff class is medium. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderate. It has a moderate 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 (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

Albion soil makes up 30 percent of the map unit. This map unit is in the Great Bend Sand Plains Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep paleoterrace on river valley. The runoff class is medium. The parent material consists of loamy alluvium. This soil is well drained. The slowest permeability is moderately 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 (pe24-32) range site. It is in the nonirrigated land capability classification 6e.

Sp Drummond Loam, 0 To 2 Percent Slopes

Drummond soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level to gently sloping terrace on river valley. The runoff class is low. The parent material consists of clayey and/or loamy alluvium. This soil is somewhat poorly drained. The slowest permeability is very slow. It has a very low available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil contains a moderately saline horizon. This soil is in the Saline Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 6s.

Ta Tabler Clay Loam, 0 To 1 Percent Slopes

Tabler soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level paleoterrace on river valley. The runoff class is very low. The parent material consists of clayey alluvium. This soil is moderately well drained. The slowest permeability is very slow. It has a high available water capacity and a high shrink swell potential. This soil is not flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2s.

Th Tivoli Fine Sand, 8 To 15 Percent Slopes

Tivoli soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a strongly sloping to moderately steep dune on paleoterrace on river valley. The runoff class is low. The parent material consists of sandy eolian deposits. 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 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 Choppy Sands (pe24-32) range site. It is in the nonirrigated land capability classification 7e.

Vr Vernon-Renfrow Complex, 2 To 6 Percent Slopes, Eroded

Vernon soil makes up 60 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. This soil is well drained. The slowest permeability is very 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 20 percent calcium carbonate. This soil contains a slightly saline horizon, it has a horizon that is moderately sodic. This soil is in the Red Clay Prairie (pe24-32) range site. This soil is in the irrigated land capability class 4e. It is in the nonirrigated land capability classification 4e.

Renfrow soil makes up 40 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping to moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. This soil is 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. This soil is in the Clay Upland (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

Wa Kingman Clay Loam, Occasionally Flooded

Kingman soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain on river valley. The runoff class is negligible. The parent material consists of alluvium. This soil is poorly drained. The slowest permeability is moderately slow. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 12 inches. This soil contains a very slightly saline horizon. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 5w.

Wd Woodward-Quinlan Loams, 0 To 1 Percent Slopes

Woodward soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Quinlan soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level hillslope on upland. The runoff class is very low. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

NONTECHNICAL SOIL DESCRIPTIONS--Continued
Harper County, Kansas

We Woodward-Quinlan Loams, 1 To 3 Percent Slopes

Woodward soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Quinlan soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a gently sloping hillslope on upland. The runoff class is low. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Ww Woodward-Quinlan Loams, 3 To 6 Percent Slopes

Woodward soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. The soil is 20 to 40 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Loamy Upland (pe24-32) range site. It is in the nonirrigated land capability classification 3e.

Quinlan soil makes up 50 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a moderately sloping hillslope on upland. The runoff class is medium. The parent material consists of residuum. The soil is 10 to 20 inches deep to bedrock (paralithic). This soil is well drained. The slowest permeability is moderate. 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. The soil contains a maximum amount of 5 percent calcium carbonate. This soil is in the Shallow Prairie (pe24-32) range site. It is in the nonirrigated land capability classification 4e.

Za Canadian Fine Sandy Loam, Rarely Flooded

Canadian soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level flood plain. The runoff class is negligible. The parent material consists of alluvium. This soil is well drained. The slowest permeability is moderately rapid. It has a moderate 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. This soil is in the Sandy Lowland (pe24-32) range site. It is in the nonirrigated land capability classification 2e.

Zf Zenda Fine Sandy Loam, Occasionally Flooded

Zenda soil makes up 100 percent of the map unit. This map unit is in the Central Rolling Red Prairies Major Land Resource Area. This soil occurs on a nearly level dune on paleoterrace on river valley. The runoff class is negligible. The parent material consists of sandy eolian deposits. This soil is somewhat poorly drained. The slowest permeability is moderate. It has a high available water capacity and a moderate shrink swell potential. This soil is occasionally flooded and is not ponded. The top of the seasonal high water table is at 36 inches. This soil contains a very slightly saline horizon. This soil is in the Subirrigated (pe24-32) range site. It is in the nonirrigated land capability classification 2w.

007AE—Albion and Shellabarger soils, 4 to 15 percent slopes

Map Unit Composition

Albion: 55 percent
Shellabarger: 45 percent

Component Descriptions

Albion

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 4 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Low (About 5.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe20-25)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 8 inches; sandy loam
H2—8 to 16 inches; sandy loam
H3—16 to 27 inches; loamy sand
H4—27 to 60 inches; sand

Shellabarger

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 4 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe20-25)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 14 inches; sandy loam

H2—14 to 48 inches; sandy clay loam
H3—48 to 60 inches; coarse sandy loam

Minor Components

Unnamed Wet Soils

Phase: Sandy, Drainageway

007AS—Clairemont Soils, Saline, channeled

Map Unit Composition

Clairemont: 100 percent

Component Descriptions

Clairemont

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Moderate (About 7.7 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Saline Lowland (pe20-25)
Land capability (nonirrigated): 6s

Typical Profile:

H1—0 to 8 inches; silt loam
H2—8 to 60 inches; loam

Minor Components

Unnamed Wet Soils

Phase: Sandy, Depression

Unnamed Wet Soils

Phase: Sandy, Drainageway

007FU—Farnum clay loam, 1 to 3 percent slopes, eroded**Map Unit Composition**

Farnum: 100 percent

Component Descriptions**Farnum**

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Alluvium

Slope: 1 to 3 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 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; clay loam

H2—9 to 60 inches; clay loam

Available water capacity: Low (About 4.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Frequent

Depth to seasonal water saturation: About 0 to 36 inches

Runoff class: Negligible

Ecological site: Subirrigated (pe24-32)

Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 7 inches; loamy fine sand

H2—7 to 48 inches; loamy fine sand

095AD—Albion sandy loam, 6 to 15 percent slopes**Map Unit Composition**

Albion: 100 percent

Component Descriptions**Albion**

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 6 to 15 percent

Drainage class: Well drained

Slowest permeability: Moderately rapid (About 2.00 in/hr)

Available water capacity: Low (About 5.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 8 inches; sandy loam

H2—8 to 16 inches; sandy loam

H3—16 to 26 inches; coarse sandy loam

H4—26 to 60 inches; gravelly sand

007KA—Kanza Soils, frequently flooded**Map Unit Composition**

Kanza: 100 percent

Component Descriptions**Kanza**

MLRA: 79 - Great Bend Sand Plains

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Rapid (About 5.95 in/hr)

095DA—Dillwyn-Plevna complex, occasionally flooded

Map Unit Composition

Dillwyn: 60 percent
Plevna: 40 percent

Component Descriptions

Dillwyn

MLRA: 79 - Great Bend Sand Plains
Landform: Dune on paleoterrace on river valley,
interdune on paleoterrace on river valley
Parent material: Sandy eolian deposits
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 4.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 12 to
36 inches
Runoff class: Negligible
Ecological site: Subirrigated (pe24-32)
Land capability (nonirrigated): 4w

Typical Profile:

H1—0 to 8 inches; loamy fine sand
H2—8 to 60 inches; loamy fine sand

Plevna

MLRA: 79 - Great Bend Sand Plains
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Poorly drained
Slowest permeability: Moderately rapid (About
2.00 in/hr)
Available water capacity: Moderate (About 6.5
inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 0 to
24 inches
Runoff class: Negligible
Ecological site: Subirrigated (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 11 inches; fine sandy loam
H2—11 to 36 inches; fine sandy loam
H3—36 to 60 inches; sand

Minor Components Unnamed Wet Soils

Phase: Sandy, Depression

095LA—Lincoln loamy sand, occasionally flooded

Map Unit Composition

Lincoln: 100 percent

Component Descriptions

Lincoln

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 3.3 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 60 to
72 inches
Runoff class: Negligible
Ecological site: Sandy Lowland (pe24-32)
Land capability (nonirrigated): 6w

Typical Profile:

H1—0 to 10 inches; loamy fine sand
H2—10 to 60 inches; stratified fine sand to
clay loam

Minor Components Unnamed Wet Soils

Phase: Sandy, Drainageway

095NB—Nashville-Quinlan complex, 5 to 15 percent slopes

Map Unit Composition

Nashville: 60 percent
Quinlan: 40 percent

Component Descriptions

Nashville

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 5 to 12 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 28 inches; silt loam

Cr—28 to 28 inches; weathered bedrock

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 5 to 15 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 2.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: High

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 13 inches; loam

Cr—13 to 13 inches; weathered bedrock

Minor Components

Unnamed Wet Soils

Phase: Loamy, Depression

Unnamed Wet Soils

Phase: Loamy, Drainageway

095SA—Shellabarger loamy sand, 0 to 3 percent slopes

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 0 to 3 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 12 inches; loamy sand

H2—12 to 38 inches; sandy clay loam

H3—38 to 60 inches; fine sandy loam

095SC—Shellabarger sandy loam, 3 to 6 percent slopes

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 3 to 6 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 10 inches; sandy loam
 H2—10 to 45 inches; sandy clay loam
 H3—45 to 60 inches; coarse sandy loam

**095SD—Shellabarger sandy loam,
 3 to 6 percent slopes, eroded**

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sandy (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 10 inches; sandy loam
 H2—10 to 45 inches; sandy clay loam
 H3—45 to 60 inches; coarse sandy loam

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

**095ZA—Zenda clay loam,
 occasionally flooded**

Map Unit Composition

Zenda: 100 percent

Component Descriptions

Zenda

MLRA: 80A - Central Rolling Red Prairies
Landform: Dune on paleoterrace on river valley
Parent material: Sandy eolian deposits
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.4 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 48 inches
Runoff class: Very low
Ecological site: Subirrigated (pe24-32)
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 13 inches; clay loam
 H2—13 to 60 inches; clay loam

Minor Components

Unnamed Wet Soils

Phase: Loamy, Depression

**191EA—Elandco silty clay loam,
 rarely flooded**

Map Unit Composition

Elandco: 100 percent

Component Descriptions

Elandco

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Loamy Lowland (pe24-32)
Land capability (nonirrigated): 2w

Typical Profile:
 H1—0 to 40 inches; silty clay loam
 H2—40 to 62 inches; silty clay loam

Minor Components
Unnamed Wet Soils
Phase: Clayey, Drainageway

Unnamed Wet Soils
Phase: Clayey, Depression

191EC—Elandco silt loam, frequently flooded

Map Unit Composition

Elandco: 100 percent

Component Descriptions

Elandco
MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Frequent

Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Loamy Lowland (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:
 H1—0 to 40 inches; silt loam
 H2—40 to 62 inches; silty clay loam

Minor Components
Unnamed Wet Soils
Phase: Clayey, Drainageway

Unnamed Wet Soils
Phase: Clayey, Depression

191LS—Lincoln Soils, frequently flooded

Map Unit Composition

Lincoln: 100 percent

Component Descriptions

Lincoln
MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 3.4 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: About 60 to 72 inches
Runoff class: Negligible
Ecological site: Sandy Lowland (pe24-32)
Land capability (nonirrigated): 6w

Typical Profile:
 H1—0 to 11 inches; loamy fine sand
 H2—11 to 60 inches; stratified fine sand to clay loam

Minor Components
Unnamed Wet Soils
Phase: Sandy, Drainageway

191OP—Wellsford-Elandco complex, 0 to 25 percent slopes

Map Unit Composition

Wellsford: 65 percent
Elandco: 35 percent

Component Descriptions

Wellsford

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 2 to 25 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Very low (About 1.7 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very high
Ecological site: Red Clay Prairie (pe24-32)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 5 inches; clay loam
H2—5 to 17 inches; clay
H3—17 to 21 inches; weathered bedrock

Elandco

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible

Ecological site: Loamy Lowland (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 40 inches; silt loam
H2—40 to 62 inches; silty clay loam

191PD—Pond Creek silty clay loam, 2 to 6 percent slopes, eroded

Map Unit Composition

Pond Creek: 100 percent

Component Descriptions

Pond Creek

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 2 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; silty clay loam
H2—12 to 68 inches; silty clay loam

191RA—Renfrow-Grainola complex, 1 to 3 percent slopes

Map Unit Composition

Renfrow: 70 percent
Grainola: 30 percent

Component Descriptions

Renfrow

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 8.9 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Clay Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; clay loam

H2—9 to 13 inches; silty clay loam

H3—13 to 75 inches; silty clay loam

Grainola

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 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 5.5 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Clay Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 8 inches; silt loam

H2—8 to 28 inches; silty clay

H3—28 to 36 inches; clay

H4—36 to 42 inches; weathered bedrock

191TA—Tabler silty clay loam, 0 to 1 percent slopes

Map Unit Composition

Tabler: 100 percent

Component Descriptions

Tabler

MLRA: 80A - Central Rolling Red Prairies

Landform: Paleoterrace on river valley

Parent material: Clayey alluvium

Slope: 0 to 1 percent

Drainage class: Moderately well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: High (About 9.8 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 30 to 42 inches

Runoff class: Negligible

Ecological site: Clay Upland (pe24-32)

Land capability (nonirrigated): 2s

Typical Profile:

H1—0 to 10 inches; silty clay loam

H2—10 to 30 inches; silty clay

H3—30 to 60 inches; silty clay

191US—Ustifluents, channeled

Minor Components

Unnamed Wet Soils

Phase: Sandy, Drainageway

1439—Crisfield sandy loam, rarely flooded

Map Unit Composition

Crisfield: 100 percent

Component Descriptions

Crisfield

MLRA: 80A - Central Rolling Red Prairies

Landform: Terrace on river valley

Parent material: Alluvium

Slope: 0 to 2 percent

Drainage class: Moderately well drained

Slowest permeability: Moderately rapid (About 2.00 in/hr)

Available water capacity: Low (About 4.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Rare

Depth to seasonal water saturation: About 40 to 73 inches

Runoff class: Negligible

Ecological site: Sandy Terrace (pe24-32)

Land capability (nonirrigated): 3s

Typical Profile:

H1—0 to 12 inches; sandy loam

H2—12 to 24 inches; sandy loam

H3—24 to 80 inches; coarse sand

Minor Components

Unnamed Wet Soils

Phase: Loamy, Depression

An—Kaski loam, frequently flooded

Map Unit Composition

Kaski: 100 percent

Component Descriptions

Kaski

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 2 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 10.5 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Frequent

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Loamy Lowland (pe24-32)

Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 26 inches; loam

H2—26 to 40 inches; clay loam

H3—40 to 60 inches; sandy loam

Minor Components

Unnamed Wet Soils

Phase: Sandy, Drainageway

At—Attica fine sandy loam, 1 to 3 percent slopes

Map Unit Composition

Attica: 100 percent

Component Descriptions

Attica

MLRA: 79 - Great Bend Sand Plains

Landform: Dune on paleoterrace on river valley

Parent material: Eolian deposits

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Moderately rapid (About 2.00 in/hr)

Available water capacity: Moderate (About 8.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 10 inches; fine sandy loam

H2—10 to 39 inches; fine sandy loam

H3—39 to 60 inches; fine sandy loam

Be—Bethany silt loam, 0 to 1 percent slopes**Map Unit Composition**

Bethany: 100 percent

Component Descriptions**Bethany**

MLRA: 80A - Central Rolling Red Prairies

Landform: Paleoterrace on upland

Parent material: Alluvium and/or loess over shale

Slope: 0 to 1 percent

Drainage class: Well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 10.0 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 17 inches; silty clay loam

H3—17 to 60 inches; silty clay loam

Minor Components**Unnamed Wet Soils**

Phase: Clayey, Depression

Bh—Bethany silt loam, 1 to 3 percent slopes**Map Unit Composition**

Bethany: 100 percent

Component Descriptions**Bethany**

MLRA: 80A - Central Rolling Red Prairies

Landform: Paleoterrace on upland

Parent material: Alluvium and/or loess over shale

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 10.0 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; silt loam

H2—13 to 17 inches; silty clay loam

H3—17 to 60 inches; silty clay loam

Bm—Lincoln loamy fine sand, occasionally flooded**Map Unit Composition**

Lincoln: 100 percent

Component Descriptions**Lincoln**

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 1 percent

Drainage class: Somewhat excessively drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Low (About 3.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 60 to 72 inches

Runoff class: Negligible

Ecological site: Sands (pe24-32)

Land capability (nonirrigated): 4s

Typical Profile:

H1—0 to 21 inches; loamy fine sand

H2—21 to 60 inches; stratified fine sand to clay loam

Minor Components
Unnamed Wet Soils
Phase: Sandy, Drainageway

Bo—Gerlane Variant loamy fine sand, occasionally flooded

Map Unit Composition

Gerlane: 100 percent

Component Descriptions

Gerlane
MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat excessively drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: Low (About 4.3 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 48 to 72 inches
Runoff class: Negligible
Ecological site: Sands (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:
 H1—0 to 4 inches; loamy fine sand
 H2—4 to 30 inches; stratified loamy sand to fine sandy loam
 H3—30 to 60 inches; clay

Bp—Woodward-Port complex, 0 to 20 percent slopes

Map Unit Composition

Woodward: 65 percent
 Port: 35 percent

Component Descriptions

Woodward
MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 20 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Somewhat excessively drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: High
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 6e

Typical Profile:
 H1—0 to 24 inches; silt loam
 Cr—24 to 24 inches; weathered bedrock

Port
MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace on river valley
Parent material: Alluvium
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 11.8 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Frequent
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Lowland (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:
 H1—0 to 27 inches; silt loam
 H2—27 to 60 inches; silty clay loam

Minor Components
Unnamed Wet Soils
Phase: Sandy, Depression

Unnamed Wet Soils
Phase: Sandy, Drainageway

Br—Fluents, Frequently flooded**Map Unit Composition**

Fluents: 100 percent

Component Descriptions**Fluents**

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 30 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 4.5 LEP)

Flooding hazard: Frequent

Runoff class: High

Land capability (nonirrigated): 6w

Typical Profile:

H1—0 to 6 inches; silt loam

H2—6 to 60 inches; silt loam

Ca—Carwile fine sandy loam, 0 to 1 percent slopes**Map Unit Composition**

Carwile: 100 percent

Component Descriptions**Carwile**

MLRA: 80A - Central Rolling Red Prairies

Landform: Depression on paleoterrace on river valley

Parent material: Alluvium

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained

Slowest permeability: Slow (About 0.06 in/hr)

Available water capacity: High (About 9.4 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: About 0 to 0 inches

Runoff class: Negligible

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 14 inches; fine sandy loam

H2—14 to 20 inches; sandy clay loam

H3—20 to 60 inches; clay

Minor Components**Unnamed Wet Soils**

Phase: Loamy, Depression

Cc—Case-Clark complex, 2 to 6 percent slopes**Map Unit Composition**

Case: 70 percent

Clark: 30 percent

Component Descriptions**Case**

MLRA: 80A - Central Rolling Red Prairies

Landform: Paleoterrace on river valley

Parent material: Alluvium

Slope: 2 to 6 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 10.3 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Limy Upland (pe24-32)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 60 inches; clay loam

Clark

MLRA: 80A - Central Rolling Red Prairies

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium
Slope: 2 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.3 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Limy Upland (pe24-32)
Land capability (nonirrigated): 4e

Typical Profile:
 H1—0 to 8 inches; loam
 H2—8 to 60 inches; clay loam

Ce—Corbin silt loam, 0 to 1 percent slopes

Map Unit Composition

Corbin: 100 percent

Component Descriptions

Corbin
MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.0 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 1

Typical Profile:
 H1—0 to 16 inches; silt loam
 H2—16 to 30 inches; silty clay loam
 H3—30 to 55 inches; clay
 H4—55 to 60 inches; silty clay loam

Cf—Corbin silt loam, 1 to 3 percent slopes

Map Unit Composition

Corbin: 100 percent

Component Descriptions

Corbin
MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 10.0 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:
 H1—0 to 16 inches; silt loam
 H2—16 to 30 inches; silty clay loam
 H3—30 to 55 inches; clay
 H4—55 to 60 inches; silty clay loam

Fa—Farnum clay loam, 3 to 6 percent slopes, eroded

Map Unit Composition

Farnum: 100 percent

Component Descriptions

Farnum
MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Alluvium
Slope: 3 to 6 percent

Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.0 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 4e

Typical Profile:
 H1—0 to 7 inches; clay loam
 H2—7 to 41 inches; clay loam
 H3—41 to 60 inches; clay loam

Fm—Farnum loam, 0 to 1 percent slopes

Map Unit Composition

Farnum: 100 percent

Component Descriptions

Farnum
MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Loamy Upland (pe24-32)
Land capability (irrigated): 1
Land capability (nonirrigated): 2c

Typical Profile:
 H1—0 to 11 inches; loam
 H2—11 to 41 inches; clay loam

H3—41 to 60 inches; clay loam

Minor Components
Unnamed Wet Soils
Phase: Loamy, Depression

Fn—Farnum loam, 1 to 3 percent slopes

Map Unit Composition

Farnum: 100 percent

Component Descriptions

Farnum
MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe24-32)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
 H1—0 to 11 inches; loam
 H2—11 to 41 inches; clay loam
 H3—41 to 60 inches; clay loam

Fu—Farnum loam, 3 to 6 percent slopes

Map Unit Composition

Farnum: 100 percent

Component Descriptions

Farnum

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Alluvium
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 11 inches; loam
 H2—11 to 41 inches; clay loam
 H3—41 to 60 inches; clay loam

Ge—Gerlane fine sandy loam, occasionally flooded

Map Unit Composition

Gerlane: 100 percent

Component Descriptions

Gerlane

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Moderate (About 8.9 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 72 inches
Runoff class: Very low

Ecological site: Subirrigated (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 17 inches; fine sandy loam
 H2—17 to 40 inches; fine sandy loam
 H3—40 to 48 inches; loamy sand
 H4—48 to 60 inches; clay loam

Minor Components

Unnamed Wet Soils

Phase: Sandy, Drainageway

Gn—Grant silt loam, 0 to 1 percent slopes

Map Unit Composition

Grant: 100 percent

Component Descriptions

Grant

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace on upland
Parent material: Residuum
Slope: 0 to 1 percent
Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.57 in/hr)
Available water capacity: High (About 9.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 11 inches; silt loam
 H2—11 to 33 inches; silty clay loam
 H3—33 to 50 inches; silt loam
 Cr—50 to 50 inches; weathered bedrock

Gr—Grant silt loam, 1 to 3 percent slopes**Map Unit Composition**

Grant: 100 percent

Component Descriptions**Grant**

MLRA: 80A - Central Rolling Red Prairies

Landform: Terrace on upland

Parent material: Residuum

Slope: 1 to 3 percent

Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.57 in/hr)

Available water capacity: High (About 9.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 11 inches; silt loam

H2—11 to 33 inches; silty clay loam

H3—33 to 50 inches; silt loam

Cr—50 to 50 inches; weathered bedrock

Landform: Terrace on upland

Parent material: Residuum

Slope: 3 to 6 percent

Depth to restrictive feature: 40 to 60 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.57 in/hr)

Available water capacity: High (About 9.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 11 inches; silt loam

H2—11 to 33 inches; silty clay loam

H3—33 to 50 inches; silt loam

Cr—50 to 60 inches; weathered bedrock

INT—Aquolls**Ka—Kanza loamy fine sand, frequently flooded****Map Unit Composition**

Kanza: 100 percent

Component Descriptions**Kanza**

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Low (About 5.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: Frequent

Depth to seasonal water saturation: About 0 to 36 inches

Runoff class: Negligible

GRP—Gravel Pits**Gs—Grant silt loam, 3 to 6 percent slopes****Map Unit Composition**

Grant: 100 percent

Component Descriptions**Grant**

MLRA: 80A - Central Rolling Red Prairies

Ecological site: Subirrigated (pe24-32)
Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 8 inches; loamy fine sand
H2—8 to 60 inches; loamy fine sand

Minor Components

Unnamed Wet Soils

Phase: Sandy, Drainageway

Kk—Kaski loam, occasionally flooded

Map Unit Composition

Kaski: 100 percent

Component Descriptions

Kaski

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 10.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Loamy Lowland (pe24-32)
Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 19 inches; loam
H2—19 to 40 inches; loam
H3—40 to 60 inches; sandy loam

Minor Components

Wet Alluvial Land

Km—Kirkland silt loam, 0 to 1 percent slopes

Map Unit Composition

Kirkland: 100 percent

Component Descriptions

Kirkland

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.5 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 2s

Typical Profile:

H1—0 to 12 inches; silt loam
H2—12 to 34 inches; silty clay
H3—34 to 60 inches; clay

Kr—Kirkland-Renfrow clay loams, 1 to 3 percent slopes

Map Unit Composition

Kirkland: 70 percent
Renfrow: 30 percent

Component Descriptions

Kirkland

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Drainage class: Well drained

Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:
 H1—0 to 12 inches; clay loam
 H2—12 to 34 inches; silty clay
 H3—34 to 60 inches; clay

Renfrow

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.9 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:
 H1—0 to 9 inches; clay loam
 H2—9 to 13 inches; clay loam
 H3—13 to 60 inches; clay

Kw—Kirkland-Renfrow Soils, 1 to 3 percent slopes, eroded

Map Unit Composition

Kirkland: 70 percent
 Renfrow: 30 percent

Component Descriptions

Kirkland

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.0 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 4e

Typical Profile:
 H1—0 to 6 inches; clay loam
 H2—6 to 34 inches; silty clay
 H3—34 to 60 inches; clay

Renfrow

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.6 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:
 H1—0 to 6 inches; clay loam
 H2—6 to 60 inches; clay

Mc—Minco silt loam, 0 to 1 percent slopes

Map Unit Composition

Minco: 100 percent

Component Descriptions

Minco

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Eolian deposits

Slope: 0 to 1 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 42 inches; silt loam

H2—42 to 60 inches; silt loam

Mn—Minco silt loam, 1 to 3 percent slopes

Map Unit Composition

Minco: 100 percent

Component Descriptions

Minco

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Eolian deposits

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 42 inches; silt loam

H2—42 to 60 inches; silt loam

Mo—Minco silt loam, 3 to 6 percent slopes

Map Unit Composition

Minco: 100 percent

Component Descriptions

Minco

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Eolian deposits

Slope: 3 to 6 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 11.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 42 inches; silt loam

H2—42 to 60 inches; silt loam

Na—Nashville silt loam, 0 to 1 percent slopes**Map Unit Composition**

Nashville: 100 percent

Component Descriptions**Nashville**

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 0 to 1 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2s

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 30 inches; silt loam

Cr—30 to 30 inches; weathered bedrock

Ne—Nashville silt loam, 1 to 3 percent slopes**Map Unit Composition**

Nashville: 100 percent

Component Descriptions**Nashville**

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 30 inches; silt loam

Cr—30 to 30 inches; weathered bedrock

Nh—Nashville silt loam, 3 to 6 percent slopes**Map Unit Composition**

Nashville: 100 percent

Component Descriptions**Nashville**

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 3 to 6 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 6.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 12 inches; silt loam

H2—12 to 30 inches; silt loam
H3—30 to 60 inches; weathered bedrock

Nn—Nashville silt loam, 3 to 6 percent slopes, eroded

Map Unit Composition

Nashville: 100 percent

Component Descriptions

Nashville

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 3 to 6 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Moderate (About 6.6 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; silt loam
H2—7 to 30 inches; silt loam
Cr—30 to 30 inches; weathered bedrock

No—Milan loam, 1 to 3 percent slopes

Map Unit Composition

Norge: 100 percent

Component Descriptions

Norge

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 10.9 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe24-32)
Land capability (irrigated): 2e
Land capability (nonirrigated): 2e

Typical Profile:
H1—0 to 10 inches; loam
H2—10 to 60 inches; clay loam

Pc—Pond Creek silt loam, 0 to 1 percent slopes

Map Unit Composition

Pond Creek: 100 percent

Component Descriptions

Pond Creek

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible

Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 13 inches; silt loam
 H2—13 to 60 inches; silty clay loam

Pd—Pond Creek silt loam, 1 to 3 percent slopes

Map Unit Composition

Pond Creek: 100 percent

Component Descriptions

Pond Creek

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; silt loam
 H2—13 to 60 inches; silty clay loam

Pe—Pond Creek silt loam, 3 to 6 percent slopes

Map Unit Composition

Pond Creek: 100 percent

Component Descriptions

Pond Creek

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 13 inches; silt loam
 H2—13 to 60 inches; silty clay loam

Pg—Pond Creek silt loam, 3 to 6 percent slopes, eroded

Map Unit Composition

Pond Creek: 100 percent

Component Descriptions

Pond Creek

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace
Parent material: Alluvium
Slope: 3 to 6 percent
Drainage class: Well drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: High (About 11.1 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 8 inches; silt loam
H2—8 to 60 inches; silty clay loam

Ph—Dale silt loam, rarely flooded

Map Unit Composition

Dale: 100 percent

Component Descriptions

Dale

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace on river valley
Parent material: 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: Moderate (About 4.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Loamy Terrace (pe24-32)
Land capability (nonirrigated): 1

Typical Profile:

H1—0 to 22 inches; silt loam
H2—22 to 60 inches; silt loam

Minor Components

Unnamed Wet Soils

Phase: Loamy, Depression

Unnamed Wet Soils

Phase: Loamy, Drainageway

Pk—Buttermilk silt loam, rarely flooded

Map Unit Composition

Port: 100 percent

Component Descriptions

Port

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: High (About 9.2 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: About 54 to 72 inches
Runoff class: Negligible
Ecological site: Saline Lowland (pe24-32)
Land capability (nonirrigated): 3s

Typical Profile:

H1—0 to 22 inches; silt loam
H2—22 to 44 inches; silt loam
H3—44 to 60 inches; silty clay loam

Minor Components

Slickspots

Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Ecological site: Saline Lowland (pe24-32)

Unnamed Wet Soils

Phase: Loamy, Depression

Unnamed Wet Soils

Phase: Loamy, Drainageway

Pm—Pratt loamy fine sand, 3 to 8 percent slopes

Map Unit Composition

Pratt: 100 percent

Component Descriptions

Pratt

MLRA: 79 - Great Bend Sand Plains

Landform: Dune on paleoterrace on river valley

Parent material: Sandy eolian deposits

Slope: 3 to 8 percent

Drainage class: Well drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Moderate (About 6.4 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sands (pe24-32)

Land capability (irrigated): 3e

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 12 inches; loamy fine sand

H2—12 to 36 inches; loamy fine sand

H3—36 to 60 inches; fine sand

Minor Components

Carwile

Unnamed Wet Soils

Phase: Sandy, Depression

Pn—Pratt loamy fine sand, siltstone substratum, 3 to 8 percent slopes

Map Unit Composition

Pratt: 100 percent

Component Descriptions

Pratt

MLRA: 79 - Great Bend Sand Plains

Landform: Dune on paleoterrace on river valley

Parent material: Sandy eolian deposits

Slope: 3 to 8 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Low (About 3.5 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sands (pe24-32)

Land capability (irrigated): 3e

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 12 inches; loamy fine sand

H2—12 to 37 inches; loamy fine sand

Cr—37 to 37 inches; weathered bedrock

Minor Components

Carwile

Unnamed Wet Soils

Phase: Sandy, Depression

Po—Pratt-Carwile complex, 0 to 8 percent slopes

Map Unit Composition

Pratt: 65 percent

Carwile: 35 percent

Component Descriptions

Pratt

MLRA: 79 - Great Bend Sand Plains

Landform: Dune on paleoterrace on river valley

Parent material: Sandy eolian deposits

Slope: 3 to 8 percent

Drainage class: Well drained

Slowest permeability: Rapid (About 5.95 in/hr)

Available water capacity: Moderate (About 6.4 inches)

Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 12 to 24 inches
Runoff class: Low
Ecological site: Sands (pe24-32)
Land capability (irrigated): 3e
Land capability (nonirrigated): 4e

Typical Profile:
 H1—0 to 12 inches; loamy fine sand
 H2—12 to 36 inches; loamy fine sand
 H3—36 to 60 inches; fine sand

Carwile

MLRA: 79 - Great Bend Sand Plains
Landform: Depression on paleoterrace on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Slow (About 0.06 in/hr)
Available water capacity: High (About 9.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 0 to 0 inches
Runoff class: Negligible
Ecological site: Sandy (pe24-32)
Land capability (nonirrigated): 2w

Typical Profile:
 H1—0 to 14 inches; fine sandy loam
 H2—14 to 20 inches; sandy clay loam
 H3—20 to 42 inches; clay
 H4—42 to 60 inches; sandy clay loam

Minor Components
Unnamed Wet Soils

Phase: Sandy, Depression

Pt—Pratt-Tivoli loamy fine sands, 8 to 15 percent slopes

Map Unit Composition

Pratt: 50 percent
 Tivoli: 50 percent

Component Descriptions

Pratt

MLRA: 79 - Great Bend Sand Plains
Landform: Dune on paleoterrace on river valley
Parent material: Sandy eolian deposits
Slope: 8 to 15 percent
Drainage class: Well drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Moderate (About 6.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sands (pe24-32)
Land capability (nonirrigated): 6e

Typical Profile:
 H1—0 to 12 inches; loamy fine sand
 H2—12 to 20 inches; loamy fine sand
 H3—20 to 60 inches; fine sand

Tivoli

MLRA: 79 - Great Bend Sand Plains
Landform: Dune on paleoterrace on river valley
Parent material: Sandy eolian deposits
Slope: 8 to 15 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Low (About 3.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sands (pe24-32)
Land capability (nonirrigated): 7e

Typical Profile:
 H1—0 to 5 inches; loamy fine sand
 H2—5 to 60 inches; fine sand

Minor Components
Carwile

Unnamed Wet Soils

Phase: Sandy, Depression

Qa—Quinlan loam, 0 to 1 percent slopes

Map Unit Composition

Quinlan: 100 percent

Component Descriptions

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 0 to 1 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; loam

Cr—9 to 9 inches; weathered bedrock

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; loam

Cr—9 to 9 inches; weathered bedrock

Qu—Quinlan loam, 3 to 6 percent slopes

Map Unit Composition

Quinlan: 100 percent

Component Descriptions

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 3 to 6 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 9 inches; loam

Cr—9 to 9 inches; weathered bedrock

Qn—Quinlan loam, 1 to 3 percent slopes

Map Unit Composition

Quinlan: 100 percent

Component Descriptions

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 percent

Rc—Renfrow-Vernon clay loams, 1 to 3 percent slopes

Map Unit Composition

Renfrow: 65 percent
Vernon: 35 percent

Component Descriptions

Renfrow

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Moderate (About 8.9 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; clay loam
H2—9 to 13 inches; clay loam
H3—13 to 60 inches; clay

Vernon

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 1 to 3 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Low (About 3.4 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Red Clay Prairie (pe24-32)
Land capability (irrigated): 4e

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam
H2—7 to 24 inches; silty clay
H3—24 to 28 inches;
H4—28 to 80 inches; weathered bedrock

Re—Ruella loam, 0 to 1 percent slopes

Map Unit Composition

Ruella: 100 percent

Component Descriptions

Ruella

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 0 to 1 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 1.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Very low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 2c

Typical Profile:

H1—0 to 9 inches; loam
H2—9 to 60 inches; loam

Rh—Ruella loam, 1 to 3 percent slopes

Map Unit Composition

Ruella: 100 percent

Component Descriptions

Ruella

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 1 to 3 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 1.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 9 inches; loam
 H2—9 to 60 inches; loam

Ru—Ruella loam, 3 to 6 percent slopes

Map Unit Composition

Ruella: 100 percent

Component Descriptions

Ruella

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Alluvium
Slope: 3 to 6 percent
Depth to restrictive feature: 8 to 20 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Very low (About 1.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; loam
 H2—9 to 60 inches; loam

Sa—Lesho clay loam, saline, occasionally flooded

Map Unit Composition

Lesho: 100 percent

Component Descriptions

Lesho

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain on river valley
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Moderately slow (About 0.20 in/hr)
Available water capacity: Moderate (About 7.4 inches)
Shrink-swell potential: Moderate (About 4.5 LEP)
Flooding hazard: Occasional
Depth to seasonal water saturation: About 24 to 48 inches
Runoff class: Negligible
Ecological site: Saline Subirrigated (pe24-32)
Land capability (irrigated): 4s
Land capability (nonirrigated): 6s

Typical Profile:

H1—0 to 18 inches; clay loam
 H2—18 to 36 inches; loam
 H3—36 to 60 inches; coarse sand

Minor Components

Unnamed Wet Soils

Phase: Sandy, Depression

**Sb—Shellabarger fine sandy loam,
0 to 1 percent slopes**

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 0 to 1 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Negligible

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; fine sandy loam

H2—13 to 38 inches; sandy clay loam

H3—38 to 60 inches; coarse sandy loam

**Se—Shellabarger fine sandy loam,
1 to 3 percent slopes**

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; fine sandy loam

H2—13 to 38 inches; fine sandy loam

H3—38 to 60 inches; coarse sandy loam

**Sf—Shellabarger fine sandy loam,
3 to 6 percent slopes**

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 3 to 6 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 13 inches; fine sandy loam

H2—13 to 38 inches; sandy clay loam

H3—38 to 60 inches; coarse sandy loam

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Sg—Shellabarger fine sandy loam, 3 to 6 percent slopes, eroded

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 3 to 6 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Moderate (About 8.8 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

- H1—0 to 13 inches; fine sandy loam
- H2—13 to 38 inches; sandy clay loam
- H3—38 to 60 inches; coarse sandy loam

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Sh—Zellmont sandy loam, 1 to 3 percent slopes

Map Unit Composition

Zellmont: 100 percent

Component Descriptions

Zellmont

MLRA: 80A - Central Rolling Red Prairies

Landform: Strath terrace on river valley

Parent material: Loamy alluvium over residuum weathered from permian shale

Slope: 1 to 3 percent

Depth to restrictive feature: 20 to 39 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Low (About 4.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sandy (pe21-28)

Land capability (nonirrigated): 2e

Typical Profile:

- Ap—0 to 8 inches; sandy loam
- Bt1—8 to 18 inches; sandy clay loam
- Bt2—18 to 26 inches; sandy clay loam
- 2C—26 to 32 inches; loam
- Cr—32 to 80 inches; weathered bedrock

Component note: This soil was formerly mapped as Shellabarger, shale substratum. Included with this soil are small areas with a sandy clay loam surface texture.

SHH—Shellabarger sandy loam, 1 to 3 percent slopes

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains

Landform: Paleoterrace on river valley

Parent material: Loamy alluvium

Slope: 1 to 3 percent

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 9.2 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Sandy (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 10 inches; sandy loam

H2—10 to 45 inches; sandy clay loam

H3—45 to 60 inches; coarse sandy loam

Sk—Zellmont sandy loam, 3 to 6 percent slopes

Map Unit Composition

Zellmont: 100 percent

Component Descriptions

Zellmont

MLRA: 80A - Central Rolling Red Prairies

Landform: Strath terrace on river valley

Parent material: Loamy alluvium over residuum weathered from permian shale

Slope: 3 to 6 percent

Depth to restrictive feature: 20 to 39 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Low (About 4.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sandy (pe21-28)

Land capability (nonirrigated): 3e

Typical Profile:

Ap—0 to 8 inches; sandy loam

Bt1—8 to 18 inches; sandy clay loam

Bt2—18 to 26 inches; sandy clay loam

2C—26 to 32 inches; loam

Cr—32 to 80 inches; weathered bedrock

Component note: This soil was formerly mapped as Shellabarger, shale substratum. Included with this soil are small areas with a sandy clay loam surface texture.

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Sm—Zellmont sandy loam, 3 to 6 percent slopes, eroded

Map Unit Composition

Zellmont: 100 percent

Component Descriptions

Zellmont

MLRA: 80A - Central Rolling Red Prairies

Landform: Strath terrace on river valley

Parent material: Loamy alluvium over residuum weathered from permian shale

Slope: 3 to 6 percent

Depth to restrictive feature: 20 to 39 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: Low (About 4.9 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Sandy (pe21-28)

Land capability (nonirrigated): 3e

Typical Profile:

Ap—0 to 8 inches; sandy loam

Bt1—8 to 18 inches; sandy clay loam

Bt2—18 to 26 inches; sandy clay loam

2C—26 to 32 inches; loam

Cr—32 to 80 inches; weathered bedrock

Component note: This soil was formerly mapped as Shellabarger, shale substratum. Included with this soil are small areas with a sandy clay loam surface texture.

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

**Sn—Shellabarger loamy fine sand,
0 to 3 percent slopes**

Map Unit Composition

Shellabarger: 100 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 0 to 3 percent
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Moderate (About 8.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Sands (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 13 inches; loamy fine sand
 H2—13 to 38 inches; sandy clay loam
 H3—38 to 60 inches; coarse sandy loam

**So—Shellabarger and Albion soils,
7 to 15 percent slopes**

Map Unit Composition

Shellabarger: 70 percent
 Albion: 30 percent

Component Descriptions

Shellabarger

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 7 to 15 percent
Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Moderate (About 8.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Sandy (pe24-32)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 13 inches; fine sandy loam
 H2—13 to 38 inches; sandy clay loam
 H3—38 to 60 inches; coarse sandy loam

Albion

MLRA: 79 - Great Bend Sand Plains
Landform: Paleoterrace on river valley
Parent material: Loamy alluvium
Slope: 7 to 15 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 2.00 in/hr)
Available water capacity: Low (About 5.8 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Sandy (pe24-32)
Land capability (nonirrigated): 6e

Typical Profile:

H1—0 to 6 inches; sandy loam
 H2—6 to 21 inches; sandy loam
 H3—21 to 60 inches; loamy sand

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Sp—Drummond loam, 0 to 2 percent slopes

Map Unit Composition

Drummond: 100 percent

Component Descriptions

Drummond

MLRA: 80A - Central Rolling Red Prairies
Landform: Terrace on river valley
Parent material: Clayey and/or loamy alluvium
Slope: 0 to 2 percent
Drainage class: Somewhat poorly drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: Very low (About 2.8 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 24 to 48 inches
Runoff class: Low
Ecological site: Saline Lowland (pe24-32)
Land capability (nonirrigated): 6s

Typical Profile:

H1—0 to 8 inches; loam
 H2—8 to 30 inches; clay loam
 H3—30 to 60 inches; variable

Minor Components

Unnamed Wet Soils

Phase: Clayey, Depression

Ta—Tabler clay loam, 0 to 1 percent slopes

Map Unit Composition

Tabler: 100 percent

Component Descriptions

Tabler

MLRA: 80A - Central Rolling Red Prairies
Landform: Paleoterrace on river valley
Parent material: Clayey alluvium
Slope: 0 to 1 percent
Drainage class: Moderately well drained
Slowest permeability: Very slow (About 0.00 in/hr)
Available water capacity: High (About 9.8 inches)
Shrink-swell potential: High (About 7.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: About 30 to 42 inches
Runoff class: Very low

Ecological site: Clay Upland (pe24-32)
Land capability (nonirrigated): 2s

Typical Profile:

H1—0 to 10 inches; clay loam
 H2—10 to 33 inches; silty clay
 H3—33 to 60 inches; silty clay

Minor Components

Unnamed Wet Soils

Phase: Clayey, Depression

Th—Tivoli fine sand, 8 to 15 percent slopes

Map Unit Composition

Tivoli: 100 percent

Component Descriptions

Tivoli

MLRA: 80A - Central Rolling Red Prairies
Landform: Dune on paleoterrace on river valley
Parent material: Sandy eolian deposits
Slope: 8 to 15 percent
Drainage class: Excessively drained
Slowest permeability: Rapid (About 5.95 in/hr)
Available water capacity: Very low (About 3.0 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Low
Ecological site: Choppy Sands (pe24-32)
Land capability (nonirrigated): 7e

Typical Profile:

H1—0 to 5 inches; fine sand
 H2—5 to 60 inches; fine sand

Vr—Vernon-Renfrow complex, 2 to 6 percent slopes, eroded

Map Unit Composition

Vernon: 60 percent
Renfrow: 40 percent

Component Descriptions

Vernon

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 2 to 6 percent

Drainage class: Well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Low (About 3.4 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Red Clay Prairie (pe24-32)

Land capability (irrigated): 4e

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 24 inches; clay

H3—24 to 28 inches;

Renfrow

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 2 to 5 percent

Drainage class: Well drained

Slowest permeability: Very slow (About 0.00 in/hr)

Available water capacity: Moderate (About 8.6 inches)

Shrink-swell potential: High (About 7.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Clay Upland (pe24-32)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 7 inches; clay loam

H2—7 to 60 inches; clay

W—Water

Wa—Kingman clay loam, occasionally flooded

Map Unit Composition

Kingman: 100 percent

Component Descriptions

Kingman

MLRA: 80A - Central Rolling Red Prairies

Landform: Flood plain on river valley

Parent material: Alluvium

Slope: 0 to 1 percent

Drainage class: Poorly drained

Slowest permeability: Moderately slow (About 0.20 in/hr)

Available water capacity: High (About 9.8 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 0 to 24 inches

Runoff class: Negligible

Ecological site: Subirrigated (pe24-32)

Land capability (nonirrigated): 5w

Typical Profile:

H1—0 to 10 inches; clay loam

H2—10 to 60 inches; sandy loam

Wd—Woodward-Quinlan loams, 0 to 1 percent slopes

Map Unit Composition

Woodward: 50 percent

Quinlan: 50 percent

Component Descriptions

Woodward

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 2 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 4.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 24 inches; loam

Cr—24 to 24 inches; weathered bedrock

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 0 to 1 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Very low

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; loam

Cr—9 to 9 inches; weathered bedrock

We—Woodward-Quinlan loams, 1 to 3 percent slopes

Map Unit Composition

Woodward: 50 percent

Quinlan: 50 percent

Component Descriptions

Woodward

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 percent

Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Low (About 4.1 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Loamy Upland (pe24-32)

Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 24 inches; loam

Cr—24 to 24 inches; weathered bedrock

Quinlan

MLRA: 80A - Central Rolling Red Prairies

Landform: Hillslope on upland

Parent material: Residuum

Slope: 1 to 3 percent

Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)

Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Low

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 9 inches; loam
Cr—9 to 9 inches; weathered bedrock

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Ww—Woodward-Quinlan loams, 3 to 6 percent slopes

Map Unit Composition

Woodward: 50 percent
Quinlan: 50 percent

Component Descriptions

Woodward

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 3 to 6 percent
Depth to restrictive feature: 20 to 40 inches to bedrock (paralithic)
Drainage class: Well drained
Slowest permeability: Moderate (About 0.60 in/hr)
Available water capacity: Low (About 4.1 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: None
Depth to seasonal water saturation: More than 6 feet
Runoff class: Medium
Ecological site: Loamy Upland (pe24-32)
Land capability (nonirrigated): 3e

Typical Profile:

H1—0 to 24 inches; loam
Cr—24 to 24 inches; weathered bedrock

Quinlan

MLRA: 80A - Central Rolling Red Prairies
Landform: Hillslope on upland
Parent material: Residuum
Slope: 3 to 6 percent
Depth to restrictive feature: 10 to 20 inches to bedrock (paralithic)
Drainage class: Well drained

Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: Very low (About 1.7 inches)

Shrink-swell potential: Low (About 1.5 LEP)

Flooding hazard: None

Depth to seasonal water saturation: More than 6 feet

Runoff class: Medium

Ecological site: Shallow Prairie (pe24-32)

Land capability (nonirrigated): 4e

Typical Profile:

H1—0 to 9 inches; loam
Cr—9 to 9 inches; weathered bedrock

Minor Components

Unnamed Wet Soils

Phase: Loamy, Drainageway

Za—Canadian fine sandy loam, rarely flooded

Map Unit Composition

Canadian: 100 percent

Component Descriptions

Canadian

MLRA: 80A - Central Rolling Red Prairies
Landform: Flood plain
Parent material: Alluvium
Slope: 0 to 1 percent
Drainage class: Well drained
Slowest permeability: Moderately rapid (About 1.98 in/hr)
Available water capacity: Moderate (About 8.2 inches)
Shrink-swell potential: Low (About 1.5 LEP)
Flooding hazard: Rare
Depth to seasonal water saturation: More than 6 feet
Runoff class: Negligible
Ecological site: Sandy Lowland (pe24-32)
Land capability (nonirrigated): 2e

Typical Profile:

H1—0 to 21 inches; fine sandy loam
H2—21 to 37 inches; fine sandy loam
H3—37 to 60 inches; loamy fine sand

**Minor Components
Unnamed Wet Soils**

Phase: Loamy, Drainageway

**Zf—Zenda fine sandy loam,
occasionally flooded**

Map Unit Composition

Zenda: 100 percent

Component Descriptions

Zenda

MLRA: 80A - Central Rolling Red Prairies

Landform: Dune on paleoterrace on river valley

Parent material: Sandy eolian deposits

Slope: 0 to 1 percent

Drainage class: Somewhat poorly drained
Slowest permeability: Moderate (About 0.60 in/hr)

Available water capacity: High (About 10.0 inches)

Shrink-swell potential: Moderate (About 4.5 LEP)

Flooding hazard: Occasional

Depth to seasonal water saturation: About 24 to 48 inches

Runoff class: Negligible

Ecological site: Subirrigated (pe24-32)

Land capability (nonirrigated): 2w

Typical Profile:

H1—0 to 15 inches; fine sandy loam

H2—15 to 60 inches; clay loam

**Minor Components
Unnamed Wet Soils**

Phase: Loamy, Drainageway

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
007FU	Farnum clay loam, 1 to 3 percent slopes, eroded	All areas are prime farmland
095SC	Shellabarger sandy loam, 3 to 6 percent slopes	All areas are prime farmland
095SD	Shellabarger sandy loam, 3 to 6 percent slopes, eroded	All areas are prime farmland
095ZA	Zenda clay loam, occasionally flooded	All areas are prime farmland
191EA	Blandco silty clay loam, rarely flooded	All areas are prime farmland
191PD	Pond creek silty clay loam, 2 to 6 percent slopes, eroded	All areas are prime farmland
191RA	Renfrow-grainola complex, 1 to 3 percent slopes	All areas are prime farmland
191TA	Tabler silty clay loam, 0 to 1 percent slopes	All areas are prime farmland
At	Attica fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
Be	Bethany silt loam, 0 to 1 percent slopes	All areas are prime farmland
Bh	Bethany silt loam, 1 to 3 percent slopes	All areas are prime farmland
Cc	Case-clark complex, 2 to 6 percent slopes	All areas are prime farmland
Ce	Corbin silt loam, 0 to 1 percent slopes	All areas are prime farmland
Cf	Corbin silt loam, 1 to 3 percent slopes	All areas are prime farmland
Fa	Farnum clay loam, 3 to 6 percent slopes, eroded	All areas are prime farmland
Fm	Farnum loam, 0 to 1 percent slopes	All areas are prime farmland
Fn	Farnum loam, 1 to 3 percent slopes	All areas are prime farmland
Fu	Farnum loam, 3 to 6 percent slopes	All areas are prime farmland
Ge	Gerlane fine sandy loam, occasionally flooded	All areas are prime farmland
Gn	Grant silt loam, 0 to 1 percent slopes	All areas are prime farmland
Gr	Grant silt loam, 1 to 3 percent slopes	All areas are prime farmland
Gs	Grant silt loam, 3 to 6 percent slopes	All areas are prime farmland
Kk	Kaski loam, occasionally flooded	All areas are prime farmland
Km	Kirkland silt loam, 0 to 1 percent slopes	All areas are prime farmland
Kr	Kirkland-renfrow clay loams, 1 to 3 percent slopes	All areas are prime farmland
Kw	Kirkland-renfrow soils, 1 to 3 percent slopes, eroded	All areas are prime farmland
Mc	Minco silt loam, 0 to 1 percent slopes	All areas are prime farmland
Mn	Minco silt loam, 1 to 3 percent slopes	All areas are prime farmland
Mo	Minco silt loam, 3 to 6 percent slopes	All areas are prime farmland
Na	Nashville silt loam, 0 to 1 percent slopes	All areas are prime farmland
Ne	Nashville silt loam, 1 to 3 percent slopes	All areas are prime farmland
Nh	Nashville silt loam, 3 to 6 percent slopes	All areas are prime farmland
No	Milan loam, 1 to 3 percent slopes	All areas are prime farmland
Pc	Pond creek silt loam, 0 to 1 percent slopes	All areas are prime farmland
Pd	Pond creek silt loam, 1 to 3 percent slopes	All areas are prime farmland
Pe	Pond creek silt loam, 3 to 6 percent slopes	All areas are prime farmland
Pg	Pond creek silt loam, 3 to 6 percent slopes, eroded	All areas are prime farmland
Ph	Dale silt loam, rarely flooded	All areas are prime farmland
Re	Ruella loam, 0 to 1 percent slopes	All areas are prime farmland
Rh	Ruella loam, 1 to 3 percent slopes	All areas are prime farmland
Ru	Ruella loam, 3 to 6 percent slopes	All areas are prime farmland
Sb	Shellabarger fine sandy loam, 0 to 1 percent slopes	All areas are prime farmland
Se	Shellabarger fine sandy loam, 1 to 3 percent slopes	All areas are prime farmland
Sf	Shellabarger fine sandy loam, 3 to 6 percent slopes	All areas are prime farmland
Sg	Shellabarger fine sandy loam, 3 to 6 percent slopes, eroded	All areas are prime farmland
Sh	Zellmont sandy loam, 1 to 3 percent slopes	All areas are prime farmland
SHH	Shellabarger sandy loam, 1 to 3 percent slopes	All areas are prime farmland
Sk	Zellmont sandy loam, 3 to 6 percent slopes	All areas are prime farmland
Ta	Tabler clay loam, 0 to 1 percent slopes	All areas are prime farmland
Za	Canadian fine sandy loam, rarely flooded	All areas are prime farmland
Zf	Zenda fine sandy loam, occasionally flooded	All areas are prime farmland

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

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
007AE	Albion And Shellabarger Soils, 4 To 15 Percent Slopes-----	47
007AS	Clairemont Soils, Saline, Channeled-----	29
007FU	Farnum Clay Loam, 1 To 3 Percent Slopes, Eroded-----	70
007KA	Kanza Soils, Frequently Flooded-----	26
095AD	Albion Sandy Loam, 6 To 15 Percent Slopes-----	36
095DA	Dillwyn-Plevna Complex, Occasionally Flooded-----	31
095LA	Lincoln Loamy Sand, Occasionally Flooded-----	23
095NB	Nashville-Quinlan Complex, 5 To 15 Percent Slopes-----	29
095SA	Shellabarger Loamy Sand, 0 To 3 Percent Slopes-----	64
095SC	Shellabarger Sandy Loam, 3 To 6 Percent Slopes-----	68
095SD	Shellabarger Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	68
095ZA	Zenda Clay Loam, Occasionally Flooded-----	60
1439	Crisfield Sandy Loam, Rarely Flooded-----	30
191EA	Elandco Silty Clay Loam, Rarely Flooded-----	61
191EC	Elandco Silt Loam, Frequently Flooded-----	48
191LS	Lincoln Soils, Frequently Flooded-----	18
191OP	Wellsford-Elandco Complex, 0 To 25 Percent Slopes-----	21
191PD	Pond Creek Silty Clay Loam, 2 To 6 Percent Slopes, Eroded-----	77
191RA	Renfrow-Grainola Complex, 1 To 3 Percent Slopes-----	60
191TA	Tabler Silty Clay Loam, 0 To 1 Percent Slopes-----	70
191US	Ustifluvents, Channeled-----	31
An	Kaski Loam, Frequently Flooded-----	57
At	Attica Fine Sandy Loam, 1 To 3 Percent Slopes-----	56
Be	Bethany Silt Loam, 0 To 1 Percent Slopes-----	74
Bh	Bethany Silt Loam, 1 To 3 Percent Slopes-----	73
Bm	Lincoln Loamy Fine Sand, Occasionally Flooded-----	23
Bo	Gerlane Variant Loamy Fine Sand, Occasionally Flooded-----	26
Bp	Woodward-Port Complex, 0 To 20 Percent Slopes-----	39
Br	Fluvents, Frequently Flooded-----	0
Ca	Carwile Fine Sandy Loam, 0 To 1 Percent Slopes-----	22
Cc	Case-Clark Complex, 2 To 6 Percent Slopes-----	43
Ce	Corbin Silt Loam, 0 To 1 Percent Slopes-----	75
Cf	Corbin Silt Loam, 1 To 3 Percent Slopes-----	74
Fa	Farnum Clay Loam, 3 To 6 Percent Slopes, Eroded-----	70
Fm	Farnum Loam, 0 To 1 Percent Slopes-----	74
Fn	Farnum Loam, 1 To 3 Percent Slopes-----	73
Fu	Farnum Loam, 3 To 6 Percent Slopes-----	71
GRP	Gravel Pits-----	0
Ge	Gerlane Fine Sandy Loam, Occasionally Flooded-----	58
Gn	Grant Silt Loam, 0 To 1 Percent Slopes-----	73
Gr	Grant Silt Loam, 1 To 3 Percent Slopes-----	72
Gs	Grant Silt Loam, 3 To 6 Percent Slopes-----	69
INT	Aquolls-----	12
Ka	Kanza Loamy Fine Sand, Frequently Flooded-----	27
Kk	Kaski Loam, Occasionally Flooded-----	71
Km	Kirkland Silt Loam, 0 To 1 Percent Slopes-----	62
Kr	Kirkland-Renfrow Clay Loams, 1 To 3 Percent Slopes-----	61
Kw	Kirkland-Renfrow Soils, 1 To 3 Percent Slopes, Eroded-----	59
Mc	Minco Silt Loam, 0 To 1 Percent Slopes-----	69
Mn	Minco Silt Loam, 1 To 3 Percent Slopes-----	67
Mo	Minco Silt Loam, 3 To 6 Percent Slopes-----	65
Na	Nashville Silt Loam, 0 To 1 Percent Slopes-----	49
Ne	Nashville Silt Loam, 1 To 3 Percent Slopes-----	48
Nh	Nashville Silt Loam, 3 To 6 Percent Slopes-----	46
Nn	Nashville Silt Loam, 3 To 6 Percent Slopes, Eroded-----	53
No	Milan Loam, 1 To 3 Percent Slopes-----	77
Pc	Pond Creek Silt Loam, 0 To 1 Percent Slopes-----	76
Pd	Pond Creek Silt Loam, 1 To 3 Percent Slopes-----	75
Pe	Pond Creek Silt Loam, 3 To 6 Percent Slopes-----	72
Pg	Pond Creek Silt Loam, 3 To 6 Percent Slopes, Eroded-----	72
Ph	Dale Silt Loam, Rarely Flooded-----	67
Pk	Buttermilk Silt Loam, Rarely Flooded-----	46
Pm	Pratt Loamy Fine Sand, 3 To 8 Percent Slopes-----	38
Pn	Pratt Loamy Fine Sand, Siltstone Substratum, 3 To 8 Percent Slopes-----	24
Po	Pratt-Carwile Complex, 0 To 8 Percent Slopes-----	32
Pt	Pratt-Tivoli Loamy Fine Sands, 8 To 15 Percent Slopes-----	27
Qa	Quinlan Loam, 0 To 1 Percent Slopes-----	4
Qn	Quinlan Loam, 1 To 3 Percent Slopes-----	4
Qu	Quinlan Loam, 3 To 6 Percent Slopes-----	4
Rc	Renfrow-Vernon Clay Loams, 1 To 3 Percent Slopes-----	48
Re	Ruella Loam, 0 To 1 Percent Slopes-----	6
Rh	Ruella Loam, 1 To 3 Percent Slopes-----	6
Ru	Ruella Loam, 3 To 6 Percent Slopes-----	6
SHH	Shellabarger Sandy Loam, 1 To 3 Percent Slopes-----	71
Sa	Lesho Clay Loam, Saline, Occasionally Flooded-----	40
Sb	Shellabarger Fine Sandy Loam, 0 To 1 Percent Slopes-----	70
Se	Shellabarger Fine Sandy Loam, 1 To 3 Percent Slopes-----	69
Sf	Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes-----	66
Sg	Shellabarger Fine Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	66
Sh	Zellmont Sandy Loam, 1 To 3 Percent Slopes-----	44
Sk	Zellmont Sandy Loam, 3 To 6 Percent Slopes-----	43

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
Sm	Zellmont Sandy Loam, 3 To 6 Percent Slopes, Eroded-----	43
Sn	Shellabarger Loamy Fine Sand, 0 To 3 Percent Slopes-----	63
So	Shellabarger And Albion Soils, 7 To 15 Percent Slopes-----	52
Sp	Drummond Loam, 0 To 2 Percent Slopes-----	23
Ta	Tabler Clay Loam, 0 To 1 Percent Slopes-----	66
Th	Tivoli Fine Sand, 8 To 15 Percent Slopes-----	19
Vr	Vernon-Renfrow Complex, 2 To 6 Percent Slopes, Eroded-----	37
W	Water-----	0
Wa	Kingman Clay Loam, Occasionally Flooded-----	57
Wd	Woodward-Quinlan Loams, 0 To 1 Percent Slopes-----	20
We	Woodward-Quinlan Loams, 1 To 3 Percent Slopes-----	16
Ww	Woodward-Quinlan Loams, 3 To 6 Percent Slopes-----	19
Za	Canadian Fine Sandy Loam, Rarely Flooded-----	56
Zf	Zenda Fine Sandy Loam, Occasionally Flooded-----	58

Harper County, Kansas: Maintenance needed
 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 erodibility group	Wind erodibility index
								K	Kf	T		
007AE:ALBION----	55	N/A	6e	Not prime farmland	B	Sandy (pe20-25)	6G	.20	.20	4	3	86
007AE:SHELLABARG ER-----	45	N/A	6e	Not prime farmland	B	Sandy (pe20-25)	5	.20	.20	5	3	86
007AS:CLAIREMONT	100	N/A	6s	Not prime farmland	B	Saline Lowland (pe20-25)	1K	.43	.43	5	4L	86
007FU:FARNUM----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
007KA:KANZA-----	100	N/A	5w	Not prime farmland	D	Subirrigated (pe24-32)	2	.17	.17	5	2	134
095AD:ALBION----	100	N/A	6e	Not prime farmland	B	Sandy (pe24-32)	6G	.20	.20	4	3	86
095DA:DILLWYN---	60	N/A	4w	Not prime farmland	A	Subirrigated (pe24-32)	1	.17	.17	5	2	134
095DA:PLEVNA----	40	N/A	5w	Not prime farmland	D	Subirrigated (pe24-32)	2	.20	.20	5	3	86
095LA:LINCOLN---	100	N/A	6w	Not prime farmland	A	Sandy Lowland (pe24-32)	1K	.17	.17	5	2	134
095NB:NASHVILLE-	60	N/A	4e	Not prime farmland	B	Loamy Upland (pe24-32)	6D	.32	.32	3	6	48
095NB:QUINLAN---	40	N/A	6e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
095SA:SHELLABARG ER-----	100	N/A	2e	Not prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	2	134
095SC:SHELLABARG ER-----	100	N/A	3e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
095SD:SHELLABARG ER-----	100	N/A	3e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
095ZA:ZENDA-----	100	N/A	2w	All areas are prime farmland	C	Subirrigated (pe24-32)	1	.28	.28	5	6	48
1439:CRISFIELD--	100	N/A	3s	Not prime farmland	B	Sandy Terrace (pe24-32)	5	.15	.15	5	3	86
191EA:ELANDCO---	100	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe24-32)	1	.37	.37	5	7	38
191EC:ELANDCO---	100	N/A	5w	Not prime farmland	B	Loamy Lowland (pe24-32)	1	.43	.43	5	6	48
191LS:LINCOLN---	100	N/A	6w	Not prime farmland	A	Sandy Lowland (pe24-32)	1K	.17	.17	5	2	134

Harper County, Kansas: Maintenance needed
 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 erodibility group	Wind erodibility index
								K	Kf	T		
191OP:WELLSFORD-	65	N/A	6e	Not prime farmland	D	Red Clay Prairie (pe24-32)		.32	.32	2	4	86
191OP:ELANDCO---	35	N/A	5w	Not prime farmland	B	Loamy Lowland (pe24-32)	1	.43	.43	5	6	48
191PD:POND CREEK	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.32	.32	5	6	48
191RA:RENFROW---	70	N/A	3e	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
191RA:GRAINOLA--	30	N/A	3e	All areas are prime farmland	D	Clay Upland (pe24-32)		.43	.43	3	6	48
191TA:TABLER----	100	N/A	2s	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	7	38
191US:USTIFLUVEN TS-----	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
An:KASKI-----	100	N/A	5w	Not prime farmland	B	Loamy Lowland (pe24-32)	1	.28	.28	5	6	48
At:ATTICA-----	100	N/A	2e	All areas are prime farmland	B	Sandy (pe24-32)	5	.24	.24	5	3	86
Be:BETHANY-----	100	N/A	1	All areas are prime farmland	C	Loamy Upland (pe24-32)	4C	.43	.43	5	6	48
Bh:BETHANY-----	100	N/A	2e	All areas are prime farmland	C	Loamy Upland (pe24-32)	4C	.43	.43	5	6	48
Bm:LINCOLN-----	100	N/A	4s	Not prime farmland	A	Sands (pe24-32)	1K	.17	.17	5	2	134
Bo:GERLANE-----	100	N/A	5w	Not prime farmland	A	Sands (pe24-32)	1	.17	.17	5	2	134
Bp:WOODWARD-----	65	N/A	6e	Not prime farmland	B	Loamy Upland (pe24-32)	8	.37	.37	3	4L	86
Bp:PORT-----	35	N/A	5w	Not prime farmland	B	Loamy Lowland (pe24-32)	1	.37	.37	5	6	48
Br:BROKEN ALLUVIAL LAND--	100	N/A	6w	Not prime farmland	B	Unspecified		.37	.37	5	4L	86
Ca:CARWILE-----	100	N/A	2w	Not prime farmland	D	Sandy (pe24-32)	1	.24	.24	5	3	86
Cc:CASE-----	70	N/A	4e	All areas are prime farmland	B	Limy Upland (pe24-32)	8	.32	.32	5	4L	86

Harper County, Kansas: Maintenance needed
 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 erodibility group	Wind erodibility index
								K	Kf	T		
Cc:CLARK-----	30	N/A	4e	All areas are prime farmland	B	Limy Upland (pe24-32)	8	.28	.28	5	4L	86
Ce:CORBIN-----	100	N/A	1	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.32	.32	5	6	48
Cf:CORBIN-----	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.32	.32	5	6	48
Fa:FARNUM-----	100	N/A	4e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
Fm:FARNUM-----	100	1-	2c	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
Fn:FARNUM-----	100	2e-	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
Fu:FARNUM-----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
GRP:GRAVEL PITS-	100	N/A	N/A	Not prime farmland		Unspecified		---	---	-	---	---
Ge:GERLANE-----	100	N/A	2e	All areas are prime farmland	B	Subirrigated (pe24-32)	1	.20	.20	5	3	86
Gn:GRANT-----	100	N/A	1	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	4	5	56
Gr:GRANT-----	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	4	5	56
Gs:GRANT-----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	4	5	56
INT:AQUOLLS-----	100	N/A	5w	Not prime farmland	C	Unspecified		---	---	-	---	0
Ka:KANZA-----	100	N/A	5w	Not prime farmland	D	Subirrigated (pe24-32)	2	.17	.20	5	2	134
Kk:KASKI-----	100	N/A	2w	All areas are prime farmland	B	Loamy Lowland (pe24-32)	1	.28	.28	5	6	48
Km:KIRKLAND-----	100	N/A	2s	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.49	.49	5	6	48
Kr:KIRKLAND-----	70	N/A	3e	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48

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(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 erodibility group	Wind erodibility index
								K	Kf	T		
Kr:RENFROW-----	30	N/A	3e	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
Kw:KIRKLAND-----	70	N/A	4e	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
Kw:RENFROW-----	30	N/A	3e	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
Mc:MINCO-----	100	N/A	1	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	5	56
Mn:MINCO-----	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	5	56
Mo:MINCO-----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	5	56
Na:NASHVILLE----	100	N/A	2s	All areas are prime farmland	B	Loamy Upland (pe24-32)	6D	.32	.32	3	6	48
Ne:NASHVILLE----	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	6D	.32	.32	3	6	48
Nh:NASHVILLE----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	6D	.32	.32	3	6	48
Nn:NASHVILLE----	100	N/A	4e	Not prime farmland	B	Loamy Upland (pe24-32)	6D	.32	.32	3	6	48
No:NORGE-----	100	2e-	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.28	.28	5	6	48
Pc:POND CREEK---	100	N/A	1	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	6	48
Pd:POND CREEK---	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	6	48
Pe:POND CREEK---	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	6	48
Pg:POND CREEK---	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	3	.37	.37	5	6	48
Ph:DALE-----	100	N/A	1	All areas are prime farmland	B	Loamy Terrace (pe24-32)	1	.37	.37	5	5	56

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(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 erodibility group	Wind erodibility index
								K	Kf	T		
Pk:PORT-----	100	N/A	3s	Not prime farmland	B	Saline Lowland (pe24-32)	9L	.32	.32	5	5	56
Pm:PRATT-----	100	3e-	4e	Not prime farmland	A	Sands (pe24-32)	7	.17	.17	5	2	134
Pn:PRATT-----	100	3e-	4e	Not prime farmland	A	Sands (pe24-32)	7	.17	.17	3	2	134
Po:PRATT-----	65	3e-	4e	Not prime farmland	A	Sands (pe24-32)	7	.17	.17	5	2	134
Po:CARWILE-----	35	N/A	2w	Not prime farmland	D	Sandy (pe24-32)	1	.24	.24	5	3	86
Pt:PRATT-----	50	N/A	6e	Not prime farmland	A	Sands (pe24-32)	7	.17	.17	5	2	134
Pt:TIVOLI-----	50	N/A	7e	Not prime farmland	A	Sands (pe24-32)	7	.17	.17	5	2	134
Qa:QUINLAN-----	100	N/A	3e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
Qn:QUINLAN-----	100	N/A	3e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
Qu:QUINLAN-----	100	N/A	4e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
Rc:RENFROW-----	65	N/A	3e	Not prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
Rc:VERNON-----	35	4e-	4e	Not prime farmland	D	Red Clay Prairie (pe24-32)	4C	.37	.37	4	4	86
Re:RUELLA-----	100	N/A	2c	All areas are prime farmland	B	Loamy Upland (pe24-32)	8	.32	.32	5	4L	86
Rh:RUELLA-----	100	N/A	2e	All areas are prime farmland	B	Loamy Upland (pe24-32)	8	.32	.32	5	4L	86
Ru:RUELLA-----	100	N/A	3e	All areas are prime farmland	B	Loamy Upland (pe24-32)	8	.32	.32	5	4L	86
SHH:SHELLABARGER	100	N/A	2e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
Sa:LESHO-----	100	4s-	6s	Not prime farmland	C	Saline Subirrigated (pe24-32)	1K	.28	.28	4	4L	86
Sb:SHELLABARGER-	100	N/A	2e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86

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(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 erodibility group	Wind erodibility index
								K	Kf	T		
Se:SHELLABARGER-	100	N/A	2e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
Sf:SHELLABARGER-	100	N/A	3e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
Sg:SHELLABARGER-	100	N/A	3e	All areas are prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
Sh:ZELLMONT-----	100	N/A	2e	All areas are prime farmland	B	Sandy (pe21-28)	6	.20	.20	3	3	86
Sk:ZELLMONT-----	100	N/A	3e	All areas are prime farmland	B	Sandy (pe21-28)	6	.20	.20	3	3	86
Sm:ZELLMONT-----	100	N/A	3e	Not prime farmland	B	Sandy (pe21-28)	6	.20	.20	3	3	86
Sn:SHELLABARGER-	100	N/A	2e	Not prime farmland	B	Sands (pe24-32)	5	.20	.28	5	2	134
So:SHELLABARGER-	70	N/A	6e	Not prime farmland	B	Sandy (pe24-32)	5	.20	.20	5	3	86
So:ALBION-----	30	N/A	6e	Not prime farmland	B	Sandy (pe24-32)	6G	.20	.20	4	3	86
Sp:DRUMMOND-----	100	N/A	6s	Not prime farmland	D	Saline Lowland (pe24-32)	9W	.49	.49	2	4L	86
Ta:TABLER-----	100	N/A	2s	All areas are prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	7	38
Th:TIVOLI-----	100	N/A	7e	Not prime farmland	A	Choppy Sands (pe24-32)	7	.17	.17	5	1	250
Vr:VERNON-----	60	4e-	4e	Not prime farmland	D	Red Clay Prairie (pe24-32)	4C	.37	.37	4	4	86
Vr:RENFROW-----	40	N/A	4e	Not prime farmland	D	Clay Upland (pe24-32)	4C	.43	.43	5	6	48
W:WATER-----	100	N/A	N/A			Unspecified		---	---	-	---	---
Wa:KINGMAN-----	100	N/A	5w	Not prime farmland	D	Subirrigated (pe24-32)	2	.32	.32	5	4L	86
Wd:WOODWARD-----	50	N/A	2e	Not prime farmland	B	Loamy Upland (pe24-32)	8	.37	.37	3	4L	86
Wd:QUINLAN-----	50	N/A	3e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
We:WOODWARD-----	50	N/A	2e	Not prime farmland	B	Loamy Upland (pe24-32)	8	.37	.37	3	4L	86

Harper County, Kansas: Maintenance needed
 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 erodibility group	Wind erodibility index
								K	Kf	T		
We:QUINLAN-----	50	N/A	3e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
Ww:WOODWARD-----	50	N/A	3e	Not prime farmland	B	Loamy Upland (pe24-32)	8	.37	.37	3	4L	86
Ww:QUINLAN-----	50	N/A	4e	Not prime farmland	C	Shallow Prairie (pe24-32)	10	.37	.37	2	4L	86
Za:CANADIAN-----	100	N/A	2e	All areas are prime farmland	B	Sandy Lowland (pe24-32)	1	.20	.20	5	3	86
Zf:ZENDA-----	100	N/A	2w	All areas are prime farmland	C	Subirrigated (pe24-32)	1	.28	.28	5	3	86

RANGELAND PRODUCTIVITY
Harper 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
Harper 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
007AE:				
Albion-----	Sandy (pe20-25)	4,000	3,000	2,000
Shellabarger-----	Sandy (pe20-25)	4,500	3,200	2,000
007AS:				
Clairemont-----	Saline Lowland (pe20-25)	3,500	2,600	1,800
007FU:				
Farnum-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
007KA:				
Kanza-----	Subirrigated (pe24-32)	9,000	8,000	7,000
095AD:				
Albion-----	Sandy (pe24-32)	4,000	3,000	2,000
095DA:				
Dillwyn-----	Subirrigated (pe24-32)	9,000	8,000	7,000
Plevna-----	Subirrigated (pe24-32)	9,000	8,000	7,000
095LA:				
Lincoln-----	Sandy Lowland (pe24-32)	3,000	2,300	1,800
095NB:				
Nashville-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
095SA:				
Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
095SC:				
Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
095SD:				
Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
095ZA:				
Zenda-----	Subirrigated (pe24-32)	9,000	8,000	7,000
191EA:				
Elandco-----	Loamy Lowland (pe24-32)	6,500	5,000	3,500
191EC:				
Elandco-----	Loamy Lowland (pe24-32)	6,500	5,000	3,500
191LS:				
Lincoln-----	Sandy Lowland (pe24-32)	3,000	2,300	1,800
191OP:				
Wellsford-----	Red Clay Prairie (pe24-32)	3,000	2,000	1,500
Elandco-----	Loamy Lowland (pe24-32)	6,500	5,000	3,500
191PD:				
Pond Creek-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
191RA:				
Renfrow-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Grainola-----	Clay Upland (pe24-32)	4,000	2,800	2,000
191TA:				
Tabler-----	Clay Upland (pe24-32)	3,800	2,600	1,800
191US:				
Ustifluvents-----	---	---	---	---
1439:				
Crisfield-----	Sandy Terrace (pe24-32)	6,000	5,000	3,500
An:				
Kaski-----	Loamy Lowland (pe24-32)	7,000	6,000	4,500
At:				
Attica-----	Sandy (pe24-32)	4,500	3,000	2,000
Be:				
Bethany-----	Loamy Upland (pe24-32)	5,000	3,500	2,500
Bh:				
Bethany-----	Loamy Upland (pe24-32)	5,000	3,500	2,500
Bm:				
Lincoln-----	Sands (pe24-32)	3,000	2,300	1,800
Bo:				
Gerlane-----	Sands (pe24-32)	3,800	3,000	2,200
Bp:				
Woodward-----	Loamy Upland (pe24-32)	4,000	2,800	2,000
Port-----	Loamy Lowland (pe24-32)	8,500	6,100	4,500
Br:				
Broken Alluvial Land-----	---	---	---	---
Ca:				
Carwile-----	Sandy (pe24-32)	5,000	3,800	3,000
Cc:				
Case-----	Limy Upland (pe24-32)	5,000	4,000	3,000
Clark-----	Limy Upland (pe24-32)	5,000	4,000	3,000
Ce:				
Corbin-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Cf:				
Corbin-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Fa:				
Farnum-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Fm:				
Farnum-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Fn:				
Farnum-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Fu:				
Farnum-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Ge:				
Gerlane-----	Subirrigated (pe24-32)	9,000	8,000	7,000
Gn:				
Grant-----	Loamy Upland (pe24-32)	5,500	3,700	2,500

RANGELAND PRODUCTIVITY--Continued
Harper 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
Gr: Grant-----	Loamy Upland (pe24-32)	5,500	3,700	2,500
GRP: Gravel Pits-----	---	---	---	---
Gs: Grant-----	Loamy Upland (pe24-32)	5,500	3,700	2,500
INT: Aquolls-----	---	---	---	---
Ka: Kanza-----	Subirrigated (pe24-32)	9,000	8,000	7,000
Kk: Kaski-----	Loamy Lowland (pe24-32)	7,000	6,000	4,500
Km: Kirkland-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Kr: Kirkland-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Renfrow-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Kw: Kirkland-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Renfrow-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Mc: Minco-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Mn: Minco-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Mo: Minco-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Na: Nashville-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Ne: Nashville-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Nh: Nashville-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Nn: Nashville-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
No: Norge-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Pc: Pond Creek-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Pd: Pond Creek-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Pe: Pond Creek-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Pg: Pond Creek-----	Loamy Upland (pe24-32)	5,500	3,850	2,750
Ph: Dale-----	Loamy Terrace (pe24-32)	8,500	6,100	4,500
Pk: Port-----	Saline Lowland (pe24-32)	4,000	3,000	2,000
Pm: Pratt-----	Sands (pe24-32)	4,500	3,500	2,500
Pn: Pratt-----	Sands (pe24-32)	4,500	3,500	2,500
Po: Pratt-----	Sands (pe24-32)	4,500	3,500	2,500
Carwile-----	Sandy (pe24-32)	5,000	3,800	3,000
Pt: Pratt-----	Sands (pe24-32)	4,500	3,500	2,500
Tivoli-----	Sands (pe24-32)	2,000	1,400	1,000
Qa: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Qn: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Qu: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Rc: Renfrow-----	Clay Upland (pe24-32)	4,000	2,800	2,000
Vernon-----	Red Clay Prairie (pe24-32)	2,500	1,700	1,000
Re: Ruella-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Rh: Ruella-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Ru: Ruella-----	Loamy Upland (pe24-32)	5,500	4,000	2,500
Sa: Lesho-----	Saline Subirrigated (pe24-32)	6,500	5,500	4,000
Sb: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Se: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Sf: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Sg: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Sh: Zellmont-----	Sandy (pe21-28)	4,000	3,000	2,000

RANGELAND PRODUCTIVITY--Continued
Harper 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
SHH: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Sk: Zellmont-----	Sandy (pe21-28)	4,000	3,000	2,000
Sm: Zellmont, eroded-----	Sandy (pe21-28)	4,000	3,000	2,000
Sn: Shellabarger-----	Sands (pe24-32)	4,500	3,200	2,000
So: Shellabarger-----	Sandy (pe24-32)	4,500	3,200	2,000
Albion-----	Sandy (pe24-32)	4,000	3,000	2,000
Sp: Drummond-----	Saline Lowland (pe24-32)	7,000	5,800	5,000
Ta: Tabler-----	Clay Upland (pe24-32)	3,800	2,600	1,800
Th: Tivoli-----	Choppy Sands (pe24-32)	2,000	1,400	1,000
Vr: Vernon-----	Red Clay Prairie (pe24-32)	2,500	1,700	1,000
Renfrow-----	Clay Upland (pe24-32)	4,000	2,800	2,000
W: Water-----	---	---	---	---
Wa: Kingman-----	Subirrigated (pe24-32)	9,000	8,000	7,000
Wd: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Woodward-----	Loamy Upland (pe24-32)	4,000	2,800	2,000
We: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Woodward-----	Loamy Upland (pe24-32)	4,000	2,800	2,000
Ww: Quinlan-----	Shallow Prairie (pe24-32)	2,500	1,800	1,300
Woodward-----	Loamy Upland (pe24-32)	4,000	2,800	2,000
Za: Canadian-----	Sandy Lowland (pe24-32)	8,500	6,100	4,500
Zf: Zenda-----	Subirrigated (pe24-32)	9,000	8,000	7,000

BUILDING SITE DEVELOPMENT
Harper 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. These 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
Harper 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
007AE: Albion-----	55	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Shellabarger-----	45	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
007AS: Clairemont-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
007FU: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
007KA: Kanza-----	100	Very limited Flooding Depth to saturated zone	1.00 0.98	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.98
095AD: Albion-----	100	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
095DA: Dillwyn-----	60	Somewhat limited Depth to saturated zone	0.39	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone	0.39
Plevna-----	40	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
095LA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.03	Very limited Flooding	1.00
095NB: Nashville-----	60	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Slope	0.64 0.04	Very limited Slope	1.00
Quinlan-----	40	Somewhat limited Depth to soft bedrock Slope	1.00 0.16	Very limited Depth to soft bedrock Slope	1.00 0.16	Very limited Depth to soft bedrock Slope	1.00 1.00
095SA: Shellabarger-----	100	Not limited		Not limited		Not limited	
095SC: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
095SD: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
095ZA: Zenda-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.95 0.50	Very limited Flooding Shrink-swell	1.00 0.50
191EA: Elandco-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
191EC: Elandco-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
191LS: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.03	Very limited Flooding	1.00
191OP: Wellsford-----	65	Very limited Depth to soft bedrock Shrink-swell	1.00 1.00	Very limited Shrink-swell Depth to soft bedrock Slope	1.00 1.00 0.96	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 1.00
Elandco-----	35	Slope Very limited Flooding Shrink-swell	0.96 1.00 0.50	Very limited Flooding Shrink-swell	0.96 1.00 0.50	Very limited Flooding Shrink-swell	1.00 1.00 0.50

BUILDING SITE DEVELOPMENT--Continued
Harper 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
191PD: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.00
191RA: Renfrow-----	70	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Grainola-----	30	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.06	Very limited Shrink-swell	1.00
191TA: Tabler-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.95	Very limited Shrink-swell	1.00
191US: Ustifluvents-----	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1439: Crisfield-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.87	Very limited Flooding	1.00
An: Kaski-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding	1.00	Very limited Flooding Shrink-swell	1.00 0.50
At: Attica-----	100	Not limited		Not limited		Not limited	
Be: Bethany-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Bh: Bethany-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Bm: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.03	Very limited Flooding	1.00
Bo: Gerlane-----	100	Very limited Flooding	1.00	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 1.00 0.15	Very limited Flooding	1.00
Bp: Woodward-----	65	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock Slope	0.42 0.37	Very limited Slope	1.00
Port-----	35	Very limited Flooding	1.00	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding	1.00
Br: Broken Alluvial Land	100	Very limited Flooding Slope Shrink-swell	1.00 1.00 0.50	Very limited Flooding Slope Shrink-swell	1.00 1.00 0.50	Very limited Flooding Slope Shrink-swell	1.00 1.00 0.50
Ca: Carwile-----	100	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
Cc: Case-----	70	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.00
Clark-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.00
Ce: Corbin-----	100	Somewhat limited Shrink-swell	0.50	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell	0.50
Cf: Corbin-----	100	Somewhat limited Shrink-swell	0.50	Very limited Shrink-swell	1.00	Somewhat limited Shrink-swell	0.50

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Fa: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Fm: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Fn: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Fu: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Ge: Gerlane-----	100	Very limited Flooding	1.00	Very limited Flooding Depth to saturated zone	1.00 0.61	Very limited Flooding	1.00
Gn: Grant-----	100	Not limited		Not limited		Not limited	
Gr: Grant-----	100	Not limited		Not limited		Not limited	
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
INT: Aquolls-----	100	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone	1.00 0.98	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 0.98
Kk: Kaski-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Km: Kirkland-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Kr: Kirkland-----	70	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Renfrow-----	30	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Kw: Kirkland-----	70	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Renfrow-----	30	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Mc: Minco-----	100	Not limited		Not limited		Not limited	
Mn: Minco-----	100	Not limited		Not limited		Not limited	
Mo: Minco-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
Na: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock	0.64	Not limited	
Ne: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock	0.64	Not limited	
Nh: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock	0.64	Somewhat limited Slope	0.12

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Nn: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock	0.46	Somewhat limited Slope	0.12
No: Norge-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Pc: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Pd: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50
Pe: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Pg: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Slope	0.50 0.12
Ph: Dale-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell	1.00 0.50
Pk: Port-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Shrink-swell Depth to saturated zone	1.00 0.50 0.08	Very limited Flooding Shrink-swell	1.00 0.50
Pm: Pratt-----	100	Not limited		Not limited		Somewhat limited Slope	0.48
Pn: Pratt-----	100	Not limited		Somewhat limited Depth to soft bedrock	0.42	Somewhat limited Slope	0.48
Po: Pratt-----	65	Somewhat limited Depth to saturated zone	0.98	Very limited Depth to saturated zone	1.00	Somewhat limited Depth to saturated zone Slope	0.98 0.48
Carwile-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Shrink-swell	1.00 1.00
PT: Pratt-----	50	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Tivoli-----	50	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Qa: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Qn: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Qu: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12
RC: Renfrow-----	65	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00
Vernon-----	35	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to soft bedrock	1.00 0.29	Very limited Shrink-swell	1.00
Re: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Rh: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Ru: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock Slope	1.00 0.12
Sa: Lesho-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 0.95	Very limited Flooding Shrink-swell	1.00 0.50
Sb: Shellabarger-----	100	Not limited		Not limited		Not limited	
Se: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sf: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
Sg: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.12
Sh: Zellmont-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.29	Somewhat limited Shrink-swell	0.50
SHH: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sk: Zellmont-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.29	Somewhat limited Shrink-swell Slope	0.50 0.12
Sm: Zellmont, eroded---	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Shrink-swell Depth to soft bedrock	0.50 0.29	Somewhat limited Shrink-swell Slope	0.50 0.12
Sn: Shellabarger-----	100	Not limited		Not limited		Not limited	
So: Shellabarger-----	70	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Albion-----	30	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Sp: Drummond-----	100	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone	0.95	Very limited Shrink-swell	1.00
Ta: Tabler-----	100	Very limited Shrink-swell	1.00	Very limited Shrink-swell Depth to saturated zone	1.00 0.95	Very limited Shrink-swell	1.00
Th: Tivoli-----	100	Somewhat limited Slope	0.63	Somewhat limited Slope	0.63	Very limited Slope	1.00
Vr: Vernon-----	60	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.00
Renfrow-----	40	Very limited Shrink-swell	1.00	Very limited Shrink-swell	1.00	Very limited Shrink-swell Slope	1.00 0.00
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Wd: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock	0.42	Not limited	
We: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock	0.90	Not limited	
Ww: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock	1.00	Somewhat limited Depth to soft bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock	0.42	Slope Somewhat limited Slope	0.12 0.12
Za: Canadian-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Zf: Zenda-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Flooding Depth to saturated zone Shrink-swell	1.00 0.95 0.50	Very limited Flooding Shrink-swell	1.00 0.50

BUILDING SITE DEVELOPMENT--Continued
Harper 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
007AE: Albion-----	55	Somewhat limited Slope	0.16	Very limited Cutbanks cave Slope	1.00 0.16	Somewhat limited Slope	0.16
Shellabarger-----	45	Somewhat limited Slope	0.16	Somewhat limited Slope Cutbanks cave	0.16 0.10	Somewhat limited Slope	0.16
007AS: Clairemont-----	100	Very limited Flooding	1.00	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding Salinity	1.00 1.00
007FU: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
007KA: Kanza-----	100	Very limited Flooding Depth to saturated zone	1.00 0.75	Very limited Cutbanks cave Depth to saturated zone Flooding	1.00 1.00 0.80	Very limited Flooding Depth to saturated zone Droughty	1.00 0.75 0.04
095AD: Albion-----	100	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37	Somewhat limited Slope	0.37
095DA: Dillwyn-----	60	Somewhat limited Depth to saturated zone	0.19	Very limited Cutbanks cave Depth to saturated zone	1.00 1.00	Somewhat limited Droughty Depth to saturated zone	0.22 0.19
Plevna-----	40	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Cutbanks cave Flooding	1.00 1.00 0.80	Very limited Flooding Depth to saturated zone	1.00 1.00
095LA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding Depth to saturated zone	1.00 0.60 0.03	Somewhat limited Droughty Flooding	0.92 0.60
095NB: Nashville-----	60	Somewhat limited Slope	0.04	Somewhat limited Depth to soft bedrock Cutbanks cave Slope	0.64 0.10 0.04	Somewhat limited Depth to bedrock Slope	0.65 0.04
Quinlan-----	40	Somewhat limited Depth to soft bedrock Slope	1.00 0.16	Very limited Depth to soft bedrock Slope Cutbanks cave	1.00 0.16 0.10	Very limited Depth to bedrock Droughty Slope	1.00 0.87 0.16
095SA: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
095SC: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
095SD: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
095ZA: Zenda-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.95 0.60 0.10	Somewhat limited Flooding	0.60
191EA: Elandco-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60
191EC: Elandco-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00

BUILDING SITE DEVELOPMENT--Continued
Harper 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
191LS: Lincoln-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding Depth to saturated zone	1.00 0.80 0.03	Very limited Flooding Droughty	1.00 0.90
191OP: Wellsford-----	65	Very limited Depth to soft bedrock Shrink-swell Slope	1.00 1.00 0.96	Very limited Depth to soft bedrock Slope Too clayey Cutbanks cave	1.00 0.96 0.28 0.10	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.96
Elandco-----	35	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
191PD: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
191RA: Renfrow-----	70	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Grainola-----	30	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave Depth to soft bedrock	0.28 0.10 0.06	Somewhat limited Depth to bedrock Content of large stones	0.06 0.03
191TA: Tabler-----	100	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Too clayey Cutbanks cave	0.95 0.28 0.10	Not limited	
191US: Ustifluvents-----	100	Very limited Low strength Slope	1.00 1.00	Very limited Slope Cutbanks cave	1.00 0.10	Very limited Slope	1.00
1439: Crisfield-----	100	Somewhat limited Flooding	0.40	Very limited Cutbanks cave Depth to saturated zone	1.00 0.87	Somewhat limited Droughty	0.31
An: Kaski-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.80 0.10	Very limited Flooding	1.00
At: Attica-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Be: Bethany-----	100	Very limited Shrink-swell	1.00	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Not limited	
Bh: Bethany-----	100	Very limited Shrink-swell	1.00	Somewhat limited Cutbanks cave Too clayey	0.10 0.03	Not limited	
Bm: Lincoln-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding Depth to saturated zone	1.00 0.60 0.03	Somewhat limited Droughty Flooding	0.65 0.60
Bo: Gerlane-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Flooding Too clayey Depth to saturated zone	1.00 0.60 0.28 0.15	Somewhat limited Droughty Flooding	0.86 0.60

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Bp: Woodward-----	65	Somewhat limited Slope	0.37	Somewhat limited Depth to soft bedrock	0.42	Somewhat limited Depth to bedrock	0.42
Port-----	35	Very limited Flooding	1.00	Slope Cutbanks cave	0.37 0.10	Slope	0.37
Br: Broken Alluvial Land	100	Somewhat limited Flooding	1.00	Somewhat limited Flooding	0.80	Very limited Flooding	1.00
Ca: Carwile-----	100	Slope Shrink-swell	1.00 0.50	Cutbanks cave	0.10	Slope	1.00
Cc: Case-----	70	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.28 0.10	Very limited Depth to saturated zone	1.00
Clark-----	30	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ce: Corbin-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
CF: Corbin-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Fa: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Fm: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Fn: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Fu: Farnum-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ge: Gerlane-----	100	Very limited Flooding	1.00	Very limited Cutbanks cave Depth to saturated zone Flooding	1.00 0.61 0.60	Somewhat limited Flooding	0.60
Gn: Grant-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Gr: Grant-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
INT: Aquolls-----	100	Very limited Depth to saturated zone Ponding Frost action	1.00 1.00 0.50	Very limited Depth to saturated zone Ponding Cutbanks cave	1.00 1.00 0.10	Very limited Depth to saturated zone Ponding	1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone	1.00 0.75	Very limited Cutbanks cave Depth to saturated zone Flooding	1.00 1.00 0.80	Very limited Flooding Depth to saturated zone Droughty	1.00 0.75 0.04
Kk: Kaski-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Flooding Cutbanks cave	0.60 0.10	Somewhat limited Flooding	0.60

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Km: Kirkland-----	100	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Kr: Kirkland-----	70	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Renfrow-----	30	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Kw: Kirkland-----	70	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.50 0.10	Not limited	
Renfrow-----	30	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Mc: Minco-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Mn: Minco-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Mo: Minco-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Na: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.64 0.10	Somewhat limited Depth to bedrock	0.65
Ne: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.64 0.10	Somewhat limited Depth to bedrock	0.65
Nh: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.64 0.10	Somewhat limited Depth to bedrock	0.65
Nn: Nashville-----	100	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.46 0.10	Somewhat limited Depth to bedrock	0.46
No: Norge-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pc: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pd: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pe: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Pg: Pond Creek-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Cutbanks cave	0.10	Not limited	
Ph: Dale-----	100	Somewhat limited Shrink-swell Flooding	0.50 0.40	Somewhat limited Cutbanks cave	0.10	Not limited	
Pk: Port-----	100	Somewhat limited Shrink-swell Flooding	0.50 0.40	Somewhat limited Cutbanks cave Depth to saturated zone	0.10 0.08	Somewhat limited Salinity	0.13
Pm: Pratt-----	100	Not limited		Very limited Cutbanks cave	1.00	Not limited	

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Pn: Pratt-----	100	Not limited		Very limited Cutbanks cave Depth to soft bedrock	1.00 0.42	Somewhat limited Depth to bedrock Droughty	0.42 0.14
Po: Pratt-----	65	Somewhat limited Depth to saturated zone	0.75	Very limited Depth to saturated zone Cutbanks cave	1.00 1.00	Somewhat limited Depth to saturated zone	0.75
Carwile-----	35	Very limited Depth to saturated zone Shrink-swell	1.00 1.00	Very limited Depth to saturated zone Too clayey Cutbanks cave	1.00 0.28 0.10	Very limited Depth to saturated zone	1.00
Pt: Pratt-----	50	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Slope	0.63
Tivoli-----	50	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Somewhat limited Droughty Slope	0.98 0.63
Qa: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Qn: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Qu: Quinlan-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Rc: Renfrow-----	65	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
Vernon-----	35	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.50 0.29 0.10	Very limited Sodium content Depth to bedrock Droughty	1.00 0.29 0.15
Re: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Rh: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Ru: Ruella-----	100	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock Droughty	1.00 1.00
Sa: Lesho-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Very limited Cutbanks cave Depth to saturated zone Flooding	1.00 0.95 0.60	Somewhat limited Flooding Salinity	0.60 0.13
Sb: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Se: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Sf: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Sg: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Sh: Zellmont-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.29 0.10	Somewhat limited Depth to bedrock	0.29
SHH: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
Sk: Zellmont-----	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.29 0.10	Somewhat limited Depth to bedrock	0.29
Sm: Zellmont, eroded---	100	Somewhat limited Shrink-swell	0.50	Somewhat limited Depth to dense layer Depth to soft bedrock Cutbanks cave	0.50 0.29 0.10	Somewhat limited Depth to bedrock	0.29
Sn: Shellabarger-----	100	Not limited		Somewhat limited Cutbanks cave	0.10	Not limited	
So: Shellabarger-----	70	Somewhat limited Slope	0.37	Somewhat limited Slope Cutbanks cave	0.37 0.10	Somewhat limited Slope	0.37
Albion-----	30	Somewhat limited Slope	0.37	Very limited Cutbanks cave Slope	1.00 0.37	Somewhat limited Slope	0.37
Sp: Drummond-----	100	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Too clayey Cutbanks cave	0.95 0.28 0.10	Very limited Salinity Droughty	1.00 0.68
Ta: Tabler-----	100	Very limited Shrink-swell	1.00	Somewhat limited Depth to saturated zone Too clayey Cutbanks cave	0.95 0.28 0.10	Not limited	
Th: Tivoli-----	100	Somewhat limited Slope	0.63	Very limited Cutbanks cave Slope	1.00 0.63	Very limited Droughty Slope	1.00 0.63
Vr: Vernon-----	60	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Depth to dense layer Cutbanks cave	0.50 0.50 0.10	Very limited Sodium content Droughty	1.00 0.15
Renfrow-----	40	Very limited Shrink-swell	1.00	Somewhat limited Too clayey Cutbanks cave	0.12 0.10	Not limited	
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding Cutbanks cave	1.00 0.60 0.10	Very limited Depth to saturated zone Flooding	1.00 0.60

BUILDING SITE DEVELOPMENT--Continued
Harper 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
Wd: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.42 0.10	Droughty Somewhat limited Depth to bedrock	1.00 0.42
We: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.90 0.10	Droughty Somewhat limited Depth to bedrock	1.00 0.90
Ww: Quinlan-----	50	Somewhat limited Depth to soft bedrock	1.00	Very limited Depth to soft bedrock Cutbanks cave	1.00 0.10	Very limited Depth to bedrock	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to soft bedrock Cutbanks cave	0.42 0.10	Droughty Somewhat limited Depth to bedrock	1.00 0.42
Za: Canadian-----	100	Somewhat limited Flooding	0.40	Very limited Cutbanks cave	1.00	Not limited	
ZF: Zenda-----	100	Very limited Flooding Shrink-swell	1.00 0.50	Somewhat limited Depth to saturated zone Flooding Cutbanks cave	0.95 0.60 0.10	Somewhat limited Flooding	0.60

CONSTRUCTION MATERIALS
Harper County, Kansas

Construction Materials

These 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 the first table, 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
Harper 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
007AE: Albion-----	55	Poor Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.29 0.91
Shellabarger-----	45	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
007AS: Clairemont-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
007FU: Farnum-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
007KA: Kanza-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.57 0.65
095AD: Albion-----	100	Poor Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.09 0.91
095DA: Dillwyn-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.18 0.18
Plevna-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.09
095LA: Lincoln-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.22 0.39
095NB: Nashville-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Quinlan-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
095SA: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
095SC: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
095SD: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
095ZA: Zenda-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191EA: Elandco-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
191EC: Elandco-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191LS: Lincoln-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.22 0.39
191OP: Wellsford-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Elandco-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191PD: Pond Creek-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191RA: Renfrow-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Grainola-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191TA: Tabler-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
191US: Ustifluvents-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
1439: Crisfield-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.10 0.78
An: Kaski-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.09
At: Attica-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.07 0.09
Be: Bethany-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Bh: Bethany-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Bm: Lincoln-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.22 0.39
Bo: Gerlane-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.22

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Bp: Woodward-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Port-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Br: Broken Alluvial Land	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ca: Carwile-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.07
Cc: Case-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Clark-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ce: Corbin-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Cf: Corbin-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fa: Farnum-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fm: Farnum-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fn: Farnum-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Fu: Farnum-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ge: Gerlane-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.09
Gn: Grant-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Gr: Grant-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
GRP: Gravel Pits-----	100	Not rated		Not rated	

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Gs: Grant-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
INT: Aquolls-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ka: Kanza-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.57 0.65
Kk: Kaski-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.09
Km: Kirkland-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kr: Kirkland-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Renfrow-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Kw: Kirkland-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Renfrow-----	30	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mc: Minco-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mn: Minco-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Mo: Minco-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Na: Nashville-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ne: Nashville-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Nh: Nashville-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Nn: Nashville-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
No: Norge-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pc: Pond Creek-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pd: Pond Creek-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pe: Pond Creek-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pg: Pond Creek-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ph: Dale-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pk: Port-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Pm: Pratt-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.44
Pn: Pratt-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.18
Po: Pratt-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.44
Carwile-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.02
Pt: Pratt-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Good Thickest layer	0.18
Tivoli-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.57 0.99
Qa: Quinlan-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Qn: Quinlan-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Qu: Quinlan-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Rc: Renfrow-----	65	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Vernon-----	35	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Re: Ruella-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Rh: Ruella-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ru: Ruella-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sa: Lesho-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.93
Sb: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
Se: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
Sf: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
Sg: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
Sh: Zellmont-----	100	Poor			
SHH: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
Sk: Zellmont-----	100	Poor			
Sm: Zellmont, eroded---	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Sn: Shellabarger-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09
So: Shellabarger-----	70	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.05 0.09

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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Map symbol and soil name	Pct. of map unit	Potential source of gravel		Potential source of sand	
		Rating class	Value	Rating class	Value
Albion-----	30	Poor Thickest layer Bottom layer	0.00 0.00	Fair Thickest layer Bottom layer	0.09 0.49
Sp: Drummond-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ta: Tabler-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Th: Tivoli-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.99 0.99
Vr: Vernon-----	60	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Renfrow-----	40	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
W: Water-----	100	Not rated		Not rated	
Wa: Kingman-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.00 0.08
Wd: Quinlan-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Woodward-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
We: Quinlan-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Woodward-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Ww: Quinlan-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Woodward-----	50	Poor Bottom layer Thickest layer	0.00 0.00	Poor Bottom layer Thickest layer	0.00 0.00
Za: Canadian-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Thickest layer Bottom layer	0.07 0.67
Zf: Zenda-----	100	Poor Bottom layer Thickest layer	0.00 0.00	Fair Bottom layer Thickest layer	0.00 0.08

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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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
007AE: Albion-----	55	Poor Too sandy Low content of organic matter Too acid	0.00 0.00 0.95	Good		Poor Too sandy Rock fragments Hard to reclaim Slope	0.00 0.00 0.68 0.84
Shellabarger-----	45	Poor Low content of organic matter Too acid	0.00 0.84	Good		Fair Slope	0.84
007AS: Clairemont-----	100	Poor Low content of organic matter Salinity Water erosion	0.00 0.88 0.90	Good		Poor Salinity	0.00
007FU: Farnum-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.87	Good	
007KA: Kanza-----	100	Poor Wind erosion Low content of organic matter Too sandy Droughty Too acid	0.00 0.00 0.00 0.52 0.95	Fair Depth to saturated zone	0.14	Poor Too sandy Depth to saturated zone	0.00 0.14
095AD: Albion-----	100	Poor Too sandy Low content of organic matter Too acid	0.00 0.00 0.95	Good		Poor Too sandy Rock fragments Slope Hard to reclaim	0.00 0.00 0.63 0.68
095DA: Dillwyn-----	60	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.00 0.36 0.79	Fair Depth to saturated zone	0.53	Fair Too sandy Depth to saturated zone	0.36 0.53
Plevna-----	40	Poor Low content of organic matter	0.00	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
095LA: Lincoln-----	100	Poor Wind erosion Droughty Low content of organic matter Too sandy	0.00 0.04 0.08 0.22	Good		Fair Too sandy	0.22
095NB: Nashville-----	60	Fair Depth to bedrock	0.35	Poor Depth to bedrock	0.00	Fair Depth to bedrock Slope	0.35 0.96
Quinlan-----	40	Poor Depth to bedrock Droughty Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock Slope	0.00 0.84

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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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
095SA: Shellabarger-----	100	Poor Wind erosion Low content of organic matter Too acid	0.00 0.00 0.84	Good		Good	
095SC: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
095SD: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
095ZA: Zenda-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.87	Good	
191EA: Elandco-----	100	Fair Too clayey No water erosion limitation	0.98 0.99	Fair Shrink-swell	0.87	Fair Too Clayey	0.93
191EC: Elandco-----	100	Fair Water erosion	0.90	Fair Shrink-swell	0.87	Good	
191LS: Lincoln-----	100	Poor Wind erosion Low content of organic matter Droughty Too sandy	0.00 0.00 0.05 0.22	Good		Fair Too sandy	0.22
191OP: Wellsford-----	65	Poor Droughty Low content of organic matter Depth to bedrock Too clayey	0.00 0.00 0.00 0.00	Poor Depth to bedrock Shrink-swell	0.00 0.12	Poor Depth to bedrock Too Clayey Slope	0.00 0.00 0.04
Elandco-----	35	Fair Water erosion	0.90	Fair Shrink-swell	0.87	Good	
191PD: Pond Creek-----	100	Poor Low content of organic matter Too acid No water erosion limitation	0.00 0.97 0.99	Fair Shrink-swell	0.89	Good	
191RA: Renfrow-----	70	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.16	Poor Too Clayey	0.00
Grainola-----	30	Poor Low content of organic matter Too clayey Water erosion Depth to bedrock Droughty	0.00 0.00 0.90 0.93 0.95	Poor Depth to bedrock Shrink-swell	0.00 0.12	Poor Too Clayey Rock fragments Depth to bedrock	0.00 0.88 0.93

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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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
191TA: Tabler-----	100	Poor Too clayey Low content of organic matter Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.12	Poor Too Clayey	0.00
191US: Ustifluvents-----	100	Poor Low content of organic matter	0.00	Poor Low strength	0.00	Poor Slope	0.00
1439: Crisfield-----	100	Poor Too sandy Low content of organic matter Too acid Droughty	0.00 0.01 0.46 0.89	Good		Poor Too sandy	0.00
An: Kaski-----	100	Good		Fair Shrink-swell	0.99	Good	
At: Attica-----	100	Poor Low content of organic matter Too acid	0.00 0.95	Good		Good	
Be: Bethany-----	100	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.25	Poor Too Clayey	0.00
Bh: Bethany-----	100	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.25	Poor Too Clayey	0.00
Bm: Lincoln-----	100	Poor Wind erosion Too sandy Low content of organic matter Droughty	0.00 0.02 0.08 0.17	Good		Fair Too sandy	0.02
Bo: Gerlane-----	100	Poor Wind erosion Low content of organic matter Too sandy Droughty	0.00 0.00 0.22 0.45	Fair Shrink-swell	0.76	Fair Too sandy	0.22
Bp: Woodward-----	65	Fair Droughty Depth to bedrock No water erosion limitation	0.29 0.58 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock Slope	0.58 0.63
Port-----	35	Poor Low content of organic matter No water erosion limitation	0.00 0.99	Fair Shrink-swell	0.99	Good	
Br: Broken Alluvial Land	100	Poor Low content of organic matter Water erosion	0.00 0.90	Fair Shrink-swell	0.87	Poor Slope	0.00

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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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
Ca: Carwile-----	100	Poor Low content of organic matter Too clayey Too acid No water erosion limitation	0.00 0.00 0.97 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.32	Poor Depth to saturated zone Too Clayey	0.00 0.00
Cc: Case-----	70	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.87	Good	
Clark-----	30	Poor Low content of organic matter Carbonate content	0.00 0.68	Fair Shrink-swell	0.87	Fair Carbonate content	0.68
Ce: Corbin-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.61	Good	
Cf: Corbin-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.61	Good	
Fa: Farnum-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.99	Good	
Fm: Farnum-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.99	Good	
Fn: Farnum-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.99	Good	
Fu: Farnum-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.99	Good	
Ge: Gerlane-----	100	Poor Low content of organic matter	0.00	Good		Good	
Gn: Grant-----	100	Poor Low content of organic matter No water erosion limitation	0.00 0.99	Fair Depth to bedrock	0.58	Good	
Gr: Grant-----	100	Poor Low content of organic matter No water erosion limitation	0.00 0.99	Fair Depth to bedrock	0.58	Good	
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Poor Low content of organic matter No water erosion limitation	0.00 0.99	Fair Depth to bedrock	0.58	Good	

CONSTRUCTION MATERIALS--Continued
Harper County, Kansas

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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
INT: Aquolls-----	100	Poor Low content of organic matter	0.00	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
Ka: Kanza-----	100	Poor Wind erosion Low content of organic matter Too sandy Too acid Droughty	0.00 0.00 0.00 0.95 0.97	Fair Depth to saturated zone	0.14	Poor Too sandy Depth to saturated zone	0.00 0.14
Kk: Kaski-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.99	Good	
Km: Kirkland-----	100	Poor Too clayey Low content of organic matter Water erosion	0.00 0.00 0.68	Fair Shrink-swell	0.17	Poor Too Clayey	0.00
Kr: Kirkland-----	70	Poor Too clayey Low content of organic matter Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.15	Poor Too Clayey	0.00
Renfrow-----	30	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.16	Poor Too Clayey	0.00
Kw: Kirkland-----	70	Poor Too clayey Low content of organic matter Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.12	Poor Too Clayey	0.00
Renfrow-----	30	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.12	Poor Too Clayey	0.00
Mc: Minco-----	100	Fair No water erosion limitation	0.99	Good		Good	
Mn: Minco-----	100	Fair No water erosion limitation	0.99	Good		Good	
Mo: Minco-----	100	Fair No water erosion limitation	0.99	Good		Good	
Na: Nashville-----	100	Poor Low content of organic matter Depth to bedrock Water erosion	0.00 0.35 0.90	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.35

CONSTRUCTION MATERIALS--Continued
Harper 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
Ne: Nashville-----	100	Poor Low content of organic matter Depth to bedrock Water erosion	0.00 0.35 0.90	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.35
Nh: Nashville-----	100	Poor Low content of organic matter Depth to bedrock Water erosion	0.00 0.35 0.90	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.35
Nn: Nashville-----	100	Poor Low content of organic matter Depth to bedrock Water erosion	0.00 0.54 0.90	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.54
No: Norge-----	100	Poor Low content of organic matter Too acid	0.00 0.95	Fair Shrink-swell	0.87	Good	
Pc: Pond Creek-----	100	Poor Low content of organic matter Too acid No water erosion limitation	0.00 0.97 0.99	Fair Shrink-swell	0.90	Good	
Pd: Pond Creek-----	100	Poor Low content of organic matter Too acid No water erosion limitation	0.00 0.97 0.99	Fair Shrink-swell	0.90	Good	
Pe: Pond Creek-----	100	Poor Low content of organic matter Too acid No water erosion limitation	0.00 0.97 0.99	Fair Shrink-swell	0.90	Good	
Pg: Pond Creek-----	100	Poor Low content of organic matter Too acid No water erosion limitation	0.00 0.97 0.99	Fair Shrink-swell	0.87	Good	
Ph: Dale-----	100	Poor Low content of organic matter No water erosion limitation	0.00 0.99	Fair Shrink-swell	0.97	Good	
Pk: Port-----	100	Fair Salinity No water erosion limitation	0.88 0.99	Fair Shrink-swell	0.97	Fair Salinity	0.88
Pm: Pratt-----	100	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.00 0.00	Good		Poor Too sandy	0.00

CONSTRUCTION MATERIALS--Continued
Harper 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
Pn: Pratt-----	100	Poor Wind erosion Low content of organic matter Too sandy Droughty Depth to bedrock	0.00 0.00 0.00 0.06 0.58	Poor Depth to bedrock	0.00	Poor Too sandy Depth to bedrock	0.00 0.58
Po: Pratt-----	65	Poor Wind erosion Low content of organic matter Too sandy	0.00 0.00 0.00	Fair Depth to saturated zone	0.14	Poor Too sandy Depth to saturated zone	0.00 0.14
Carwile-----	35	Poor Low content of organic matter Too clayey Too acid No water erosion limitation	0.00 0.00 0.97 0.99	Poor Depth to saturated zone Shrink-swell	0.00 0.32	Poor Depth to saturated zone Too Clayey	0.00 0.00
Pt: Pratt-----	50	Poor Too sandy Wind erosion Low content of organic matter	0.00 0.00 0.00	Good		Poor Too sandy Slope	0.00 0.37
Tivoli-----	50	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.00 0.01	Good		Poor Too sandy Slope	0.00 0.37
Qa: Quinlan-----	100	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Qn: Quinlan-----	100	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Qu: Quinlan-----	100	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Rc: Renfrow-----	65	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.16	Poor Too Clayey	0.00

CONSTRUCTION MATERIALS--Continued
Harper 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
Vernon-----	35	Poor Too clayey Droughty Sodium content Low content of organic matter Depth to bedrock Carbonate content No water erosion limitation	0.00 0.05 0.10 0.50 0.71 0.97 0.99	Poor Depth to bedrock Shrink-swell	0.00 0.45	Poor Too Clayey Hard to reclaim Sodium content Depth to bedrock	0.00 0.10 0.10 0.71
Re: Ruella-----	100	Poor Droughty Depth to bedrock	0.00 0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Rh: Ruella-----	100	Poor Droughty Depth to bedrock	0.00 0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Ru: Ruella-----	100	Poor Droughty Depth to bedrock	0.00 0.00	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Sa: Lesho-----	100	Poor Low content of organic matter Salinity Too clayey	0.00 0.88 0.95	Fair		Fair Too Clayey Salinity	0.84 0.88
Sb: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
Se: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
Sf: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
Sg: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
Sh: Zellmont-----	100	Fair					
SHH: Shellabarger-----	100	Poor Low content of organic matter Too acid	0.00 0.84	Good		Good	
Sk: Zellmont-----	100	Fair					
Sm: Zellmont, eroded----	100	Fair Low content of organic matter	0.00	Poor Slope Low strength	0.00 0.00	Poor Slope	0.00

CONSTRUCTION MATERIALS--Continued
Harper 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
Sn: Shellabarger-----	100	Poor Wind erosion Low content of organic matter Too acid	0.00 0.00 0.84	Good		Good	
So: Shellabarger-----	70	Poor Low content of organic matter Too acid	0.00 0.84	Good		Fair Slope	0.63
Albion-----	30	Poor Low content of organic matter Too sandy Too acid	0.00 0.00 0.95	Good		Poor Rock fragments Too sandy Slope Hard to reclaim	0.00 0.00 0.63 0.68
Sp: Drummond-----	100	Poor Low content of organic matter Droughty Too clayey Water erosion Salinity	0.00 0.00 0.00 0.68 0.88	Fair		Poor Too Clayey Salinity	0.00 0.00
Ta: Tabler-----	100	Poor Too clayey Low content of organic matter Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.12	Poor Too Clayey	0.00
Th: Tivoli-----	100	Poor Too sandy Wind erosion Low content of organic matter Droughty	0.00 0.00 0.00 0.00	Good		Poor Too sandy Slope	0.00 0.37
Vr: Vernon-----	60	Poor Too clayey Droughty Sodium content Low content of organic matter No water erosion limitation	0.00 0.05 0.10 0.50 0.99	Fair Shrink-swell	0.12	Poor Too Clayey Hard to reclaim Sodium content	0.00 0.10 0.10
Renfrow-----	40	Poor Low content of organic matter Too clayey Water erosion	0.00 0.00 0.90	Fair Shrink-swell	0.12	Poor Too Clayey	0.00
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Poor Low content of organic matter	0.00	Poor Depth to saturated zone	0.00	Poor Depth to saturated zone	0.00
Wd: Quinlan-----	50	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00

CONSTRUCTION MATERIALS--Continued
Harper 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
Woodward-----	50	Fair Droughty Depth to bedrock No water erosion limitation	0.29 0.58 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.58
We: Quinlan-----	50	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Woodward-----	50	Fair Depth to bedrock Droughty No water erosion limitation	0.10 0.29 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.10
Ww: Quinlan-----	50	Poor Droughty Depth to bedrock Low content of organic matter No water erosion limitation	0.00 0.00 0.50 0.99	Poor Depth to bedrock	0.00	Poor Depth to bedrock	0.00
Woodward-----	50	Fair Droughty Depth to bedrock No water erosion limitation	0.29 0.58 0.99	Poor Depth to bedrock	0.00	Fair Depth to bedrock	0.58
Za: Canadian-----	100	Poor Low content of organic matter	0.00	Good		Good	
Zf: Zenda-----	100	Poor Low content of organic matter	0.00	Fair Shrink-swell	0.87	Good	

RECREATIONAL INTERPRETATIONS
Harper 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
Harper 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
007AE: Albion-----	55	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Very limited Slope	1.00
Shellabarger-----	45	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Gravel content Very limited Slope	0.06 1.00
007AS: Clairemont-----	100	Very limited Flooding Salinity	1.00 1.00	Very limited Salinity Flooding	1.00 0.40	Very limited Flooding Salinity	1.00 1.00
007FU: Farnum-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
007KA: Kanza-----	100	Very limited Flooding Depth to saturated zone Too sandy	1.00 0.98 0.92	Somewhat limited Too sandy Depth to saturated zone Flooding	0.92 0.75 0.40	Very limited Flooding Depth to saturated zone Too sandy	1.00 0.98 0.92
095AD: Albion-----	100	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Gravel content	1.00 0.06
095DA: Dillwyn-----	60	Somewhat limited Depth to saturated zone Too sandy	0.39 0.37	Somewhat limited Too sandy Depth to saturated zone	0.37 0.19	Somewhat limited Depth to saturated zone Too sandy	0.39 0.37
Plevna-----	40	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
095LA: Lincoln-----	100	Very limited Flooding Too sandy	1.00 0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy Flooding	0.79 0.60
095NB: Nashville-----	60	Somewhat limited Slope	0.04	Somewhat limited Slope	0.04	Very limited Slope Depth to bedrock	1.00 0.65
Quinlan-----	40	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope	1.00 1.00
095SA: Shellabarger-----	100	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy	0.81	Somewhat limited Too sandy Slope	0.81 0.00
095SC: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
095SD: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
095ZA: Zenda-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
191EA: Elandco-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
191EC: Elandco-----	100	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
191LS: Lincoln-----	100	Very limited Flooding Too sandy	1.00 0.79	Somewhat limited Too sandy Flooding	0.79 0.40	Very limited Flooding Too sandy	1.00 0.79
191OP: Wellsford-----	65	Very limited Depth to bedrock Slope Restricted permeability	1.00 0.96 0.45	Very limited Depth to bedrock Slope Restricted permeability	1.00 0.96 0.45	Very limited Depth to bedrock Slope Restricted permeability	1.00 1.00 0.45
Elandco-----	35	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
191PD: Pond Creek-----	100	Not limited		Not limited		Somewhat limited Slope	0.50
191RA: Renfrow-----	70	Somewhat limited		Somewhat limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
 Harper 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
Grainola-----	30	Restricted permeability	0.45	Restricted permeability	0.45	Restricted permeability	0.45
		Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Slope Somewhat limited Restricted permeability Content of large stones Slope	0.00 0.39 0.03 0.00
191TA: Tabler-----	100	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
191US: Ustifluvents-----	100	Very limited Restricted permeability Slope	1.00 1.00	Very limited Restricted permeability Slope	1.00 1.00	Very limited Slope Restricted permeability	1.00 1.00 1.00
1439: Crisfield-----	100	Very limited Flooding Too sandy	1.00 0.00	Somewhat limited Too sandy	0.00	Somewhat limited Too sandy	0.00
An: Kaski-----	100	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
At: Attica-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Be: Bethany-----	100	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39
Bh: Bethany-----	100	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability Slope	0.39 0.00
Bm: Lincoln-----	100	Very limited Flooding Too sandy	1.00 0.79	Somewhat limited Too sandy	0.79	Somewhat limited Too sandy Flooding	0.79 0.60
Bo: Gerlane-----	100	Very limited Flooding Too sandy Restricted permeability	1.00 0.79 0.39	Somewhat limited Too sandy Restricted permeability	0.79 0.39	Somewhat limited Too sandy Flooding Restricted permeability	0.79 0.60 0.39
Bp: Woodward-----	65	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Depth to bedrock	1.00 0.42
Port-----	35	Very limited Flooding	1.00	Somewhat limited Flooding	0.40	Very limited Flooding Slope	1.00 0.00
Br: Broken Alluvial Land	100	Very limited Flooding Slope	1.00 1.00	Very limited Slope Flooding	1.00 0.40	Very limited Flooding Slope	1.00 1.00
Ca: Carwile-----	100	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94
Cc: Case-----	70	Not limited		Not limited		Somewhat limited Slope	0.50
Clark-----	30	Not limited		Not limited		Somewhat limited Slope	0.50
Ce: Corbin-----	100	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39
Cf: Corbin-----	100	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability	0.39	Somewhat limited Restricted permeability Slope	0.39 0.00
Fa: Farnum-----	100	Not limited		Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Harper 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
						Slope	0.87
Fm: Farnum-----	100	Not limited		Not limited		Not limited	
Fn: Farnum-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Fu: Farnum-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Ge: Gerlane-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Gn: Grant-----	100	Not limited		Not limited		Not limited	
Gr: Grant-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
INT: Aguolls-----	100	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Restricted permeability Ponding	1.00 1.00 1.00	Very limited Restricted permeability Depth to saturated zone Ponding	1.00 1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone Too sandy	1.00 0.98 0.92	Somewhat limited Too sandy Depth to saturated zone Flooding	0.92 0.75 0.40	Very limited Flooding Depth to saturated zone Too sandy	1.00 0.98 0.92
Kk: Kaski-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60
Km: Kirkland-----	100	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
Kr: Kirkland-----	70	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.00
Renfrow-----	30	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.45 0.00
Kw: Kirkland-----	70	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.45 0.00
Renfrow-----	30	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.45 0.00
Mc: Minco-----	100	Not limited		Not limited		Not limited	
Mn: Minco-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Mo: Minco-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Na: Nashville-----	100	Not limited		Not limited		Not limited	
Ne: Nashville-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Nh: Nashville-----	100	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.65
Nn: Nashville-----	100	Not limited		Not limited		Somewhat limited Slope	0.87

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
No:						Depth to bedrock	0.46
Norge-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Pc:						Not limited	
Pond Creek-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Pd:							
Pond Creek-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Pe:							
Pond Creek-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Pg:							
Pond Creek-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Ph:							
Dale-----	100	Very limited Flooding	1.00	Not limited		Not limited	
Pk:							
Port-----	100	Very limited Flooding Salinity	1.00 0.13	Somewhat limited Salinity	0.13	Somewhat limited Salinity	0.13
Pm:							
Pratt-----	100	Somewhat limited Too sandy	0.37	Somewhat limited Too sandy	0.37	Very limited Slope Too sandy	1.00 0.37
Pn:							
Pratt-----	100	Somewhat limited Too sandy	0.37	Somewhat limited Too sandy	0.37	Very limited Slope Depth to bedrock Too sandy	1.00 0.42 0.37
Po:							
Pratt-----	65	Somewhat limited Depth to saturated zone Too sandy	0.98 0.37	Somewhat limited Depth to saturated zone Too sandy	0.75 0.37	Very limited Slope	1.00
Carwile-----	35	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Depth to saturated zone Restricted permeability	1.00 0.94	Very limited Slope	1.00
Pt:							
Pratt-----	50	Somewhat limited Slope Too sandy	0.63 0.37	Somewhat limited Slope Too sandy	0.63 0.37	Very limited Slope Too sandy	1.00 0.37
Tivoli-----	50	Somewhat limited Too sandy Slope	0.92 0.63	Somewhat limited Too sandy Slope	0.92 0.63	Very limited Slope Too sandy	1.00 0.92
Qa:							
Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Qn:							
Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.00
Qu:							
Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.87
Rc:							
Renfrow-----	65	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability Slope	0.45 0.00
Vernon-----	35	Very limited Sodium content Restricted permeability	1.00 0.45	Very limited Sodium content Restricted permeability	1.00 0.45	Very limited Sodium content Restricted permeability Slope	1.00 0.45 0.00
Re:							
Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rh:							
Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.00
Ru:							
Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.87

RECREATIONAL INTERPRETATIONS--Continued
Harper 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
Sa: Lesho-----	100	Very limited Flooding Salinity	1.00 0.13	Somewhat limited Salinity	0.13	Somewhat limited Flooding Salinity	0.60 0.13
Sb: Shellabarger-----	100	Not limited		Not limited		Not limited	
Se: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Sf: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Sg: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.87
Sh: Zellmont-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
SHH: Shellabarger-----	100	Not limited		Not limited		Somewhat limited Slope	0.00
Sk: Zellmont-----	100	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.29
Sm: Zellmont, eroded---	100	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.29
Sn: Shellabarger-----	100	Somewhat limited Too sandy	0.94	Somewhat limited Too sandy	0.94	Somewhat limited Too sandy Slope	0.94 0.00
So: Shellabarger-----	70	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope	1.00
Albion-----	30	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Very limited Slope Gravel content	1.00 0.06
Sp: Drummond-----	100	Very limited Salinity Restricted permeability	1.00 0.45	Very limited Salinity Restricted permeability	1.00 0.45	Very limited Salinity Restricted permeability	1.00 0.45
Ta: Tabler-----	100	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45
Th: Tivoli-----	100	Very limited Too sandy Slope	1.00 0.63	Very limited Too sandy Slope	1.00 0.63	Very limited Slope Too sandy	1.00 1.00
Vr: Vernon-----	60	Very limited Sodium content Restricted permeability	1.00 0.45	Very limited Sodium content Restricted permeability	1.00 0.45	Very limited Sodium content Slope Restricted permeability	1.00 0.50 0.45
Renfrow-----	40	Somewhat limited Restricted permeability	0.45	Somewhat limited Restricted permeability	0.45	Somewhat limited Slope Restricted permeability	0.50 0.45
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Very limited Flooding Depth to saturated zone Restricted permeability	1.00 1.00 0.15	Very limited Depth to saturated zone Restricted permeability	1.00 0.15	Very limited Depth to saturated zone Flooding Restricted permeability	1.00 0.60 0.15
Wd: Quinlan-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Woodward-----	50	Not limited		Not limited		Somewhat limited Slope	0.00

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
We: Quinlan-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.00
Woodward-----	50	Not limited		Not limited		Somewhat limited Slope	0.00
Ww: Quinlan-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Slope	1.00 0.87
Woodward-----	50	Not limited		Not limited		Somewhat limited Slope Depth to bedrock	0.87 0.42
Za: Canadian-----	100	Very limited Flooding	1.00	Not limited		Not limited	
Zf: Zenda-----	100	Very limited Flooding	1.00	Not limited		Somewhat limited Flooding	0.60

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
007AE: Albion-----	55	Not limited		Somewhat limited Slope	0.16
Shellabarger-----	45	Not limited		Somewhat limited Slope	0.16
007AS: Clairemont-----	100	Somewhat limited Flooding	0.40	Very limited Flooding Salinity	1.00 1.00
007FU: Farnum-----	100	Not limited		Not limited	
007KA: Kanza-----	100	Somewhat limited Too sandy Depth to saturated zone Flooding	0.92 0.44 0.40	Very limited Flooding Depth to saturated zone Droughty	1.00 0.75 0.04
095AD: Albion-----	100	Not limited		Somewhat limited Slope	0.37
095DA: Dillwyn-----	60	Somewhat limited Too sandy	0.37	Somewhat limited Droughty Depth to saturated zone	0.22 0.19
Plevna-----	40	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Flooding Depth to saturated zone	1.00 1.00
095LA: Lincoln-----	100	Somewhat limited Too sandy	0.79	Somewhat limited Droughty Flooding	0.92 0.60
095NB: Nashville-----	60	Not limited		Somewhat limited Depth to bedrock Slope	0.65 0.04
Quinlan-----	40	Not limited		Very limited Depth to bedrock Droughty Slope	1.00 0.87 0.16
095SA: Shellabarger-----	100	Somewhat limited Too sandy	0.81	Not limited	
095SC: Shellabarger-----	100	Not limited		Not limited	
095SD: Shellabarger-----	100	Not limited		Not limited	
095ZA: Zenda-----	100	Not limited		Somewhat limited Flooding	0.60
191EA: Elandco-----	100	Not limited		Somewhat limited Flooding	0.60
191EC: Elandco-----	100	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
191LS: Lincoln-----	100	Somewhat limited Too sandy Flooding	0.79 0.40	Very limited Flooding Droughty	1.00 0.90
191OP: Wellsford-----	65	Not limited		Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.96
Elandco-----	35	Somewhat limited Flooding	0.40	Very limited Flooding	1.00
191PD: Pond Creek-----	100	Not limited		Not limited	
191RA: Renfrow-----	70	Not limited		Not limited	
Grainola-----	30	Not limited		Somewhat limited Depth to bedrock Content of large stones	0.06 0.03
191TA: Tabler-----	100	Not limited		Not limited	
191US: Ustifluvents-----	100	Very limited		Very limited	

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
1439:		Water erosion	1.00	Slope	1.00
Crisfield-----	100	Slope	0.00		
An:		Somewhat limited		Somewhat limited	
Kaski-----	100	Too sandy	0.00	Droughty	0.31
At:		Somewhat limited		Very limited	
Attica-----	100	Flooding	0.40	Flooding	1.00
Be:		Not limited		Not limited	
Bethany-----	100				
Bh:		Not limited		Not limited	
Bethany-----	100				
Bm:		Not limited		Not limited	
Lincoln-----	100	Somewhat limited		Somewhat limited	
		Too sandy	0.79	Droughty	0.65
				Flooding	0.60
Bo:		Somewhat limited		Somewhat limited	
Gerlane-----	100	Too sandy	0.79	Droughty	0.86
				Flooding	0.60
Bp:		Not limited		Somewhat limited	
Woodward-----	65			Depth to bedrock	0.42
				Slope	0.37
Port-----	35	Somewhat limited		Very limited	
		Flooding	0.40	Flooding	1.00
Br:		Somewhat limited		Very limited	
Broken Alluvial Land	100	Flooding	0.40	Flooding	1.00
		Slope	0.00	Slope	1.00
Ca:		Very limited		Very limited	
Carwile-----	100	Depth to saturated zone	1.00	Depth to saturated zone	1.00
Cc:		Not limited		Not limited	
Case-----	70				
Clark-----	30	Not limited		Not limited	
Ce:		Not limited		Not limited	
Corbin-----	100				
Cf:		Not limited		Not limited	
Corbin-----	100				
Fa:		Not limited		Not limited	
Farnum-----	100				
Fm:		Not limited		Not limited	
Farnum-----	100				
Fn:		Not limited		Not limited	
Farnum-----	100				
Fu:		Not limited		Not limited	
Farnum-----	100				
Ge:		Not limited		Somewhat limited	
Gerlane-----	100			Flooding	0.60
Gn:		Not limited		Not limited	
Grant-----	100				
Gr:		Not limited		Not limited	
Grant-----	100				
GRP:		Not rated		Not rated	
Gravel Pits-----	100				
Gs:		Not limited		Not limited	
Grant-----	100				
INT:		Very limited		Very limited	
Aquolls-----	100	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Ponding	1.00	Ponding	1.00
Ka:		Somewhat limited		Very limited	
Kanza-----	100	Too sandy	0.92	Flooding	1.00
		Depth to saturated zone	0.44	Depth to saturated zone	0.75
		Flooding	0.40	Droughty	0.04
Kk:		Not limited		Somewhat limited	
Kaski-----	100			Flooding	0.60
Km:		Not limited		Not limited	
Kirkland-----	100				

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
Kr:					
Kirkland-----	70	Not limited		Not limited	
Renfrow-----	30	Not limited		Not limited	
Kw:					
Kirkland-----	70	Not limited		Not limited	
Renfrow-----	30	Not limited		Not limited	
Mc:					
Minco-----	100	Not limited		Not limited	
Mn:					
Minco-----	100	Not limited		Not limited	
MO:					
Minco-----	100	Not limited		Not limited	
Na:					
Nashville-----	100	Not limited		Somewhat limited Depth to bedrock	0.65
Ne:					
Nashville-----	100	Not limited		Somewhat limited Depth to bedrock	0.65
Nh:					
Nashville-----	100	Not limited		Somewhat limited Depth to bedrock	0.65
Nn:					
Nashville-----	100	Not limited		Somewhat limited Depth to bedrock	0.46
No:					
Norge-----	100	Not limited		Not limited	
Pc:					
Pond Creek-----	100	Not limited		Not limited	
Pd:					
Pond Creek-----	100	Not limited		Not limited	
Pe:					
Pond Creek-----	100	Not limited		Not limited	
Pg:					
Pond Creek-----	100	Not limited		Not limited	
Ph:					
Dale-----	100	Not limited		Not limited	
Pk:					
Port-----	100	Not limited		Somewhat limited Salinity	0.13
Pm:					
Pratt-----	100	Somewhat limited Too sandy	0.37	Not limited	
Pn:					
Pratt-----	100	Somewhat limited Too sandy	0.37	Somewhat limited Depth to bedrock Droughty	0.42 0.14
Po:					
Pratt-----	65	Somewhat limited Depth to saturated zone Too sandy	0.44 0.37	Somewhat limited Depth to saturated zone	0.75
Carwile-----	35	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
Pt:					
Pratt-----	50	Somewhat limited Too sandy	0.37	Somewhat limited Slope	0.63
Tivoli-----	50	Somewhat limited Too sandy	0.92	Somewhat limited Droughty Slope	0.98 0.63
Qa:					
Quinlan-----	100	Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Qn:					
Quinlan-----	100	Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Qu:					
Quinlan-----	100	Not limited		Very limited Depth to bedrock Droughty	1.00 1.00
Rc:					
Renfrow-----	65	Not limited		Not limited	
Vernon-----	35	Not limited		Very limited Sodium content Depth to bedrock Droughty	1.00 0.29 0.15
Re:					
Ruella-----	100	Not limited		Very limited Depth to bedrock	1.00

RECREATIONAL INTERPRETATIONS--Continued
Harper County, Kansas

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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
Rh: Ruella-----	100	Not limited		Droughty	1.00
				Very limited Depth to bedrock	1.00
				Droughty	1.00
Ru: Ruella-----	100	Not limited		Very limited Depth to bedrock	1.00
				Droughty	1.00
Sa: Lesho-----	100	Not limited		Somewhat limited Flooding	0.60
				Salinity	0.13
Sb: Shellabarger-----	100	Not limited		Not limited	
Se: Shellabarger-----	100	Not limited		Not limited	
Sf: Shellabarger-----	100	Not limited		Not limited	
Sg: Shellabarger-----	100	Not limited		Not limited	
Sh: Zellmont-----	100	Not limited		Somewhat limited Depth to bedrock	0.29
SHH: Shellabarger-----	100	Not limited		Not limited	
Sk: Zellmont-----	100	Not limited		Somewhat limited Depth to bedrock	0.29
Sm: Zellmont, eroded----	100	Not limited		Somewhat limited Depth to bedrock	0.29
Sn: Shellabarger-----	100	Somewhat limited Too sandy	0.94	Not limited	
So: Shellabarger-----	70	Not limited		Somewhat limited Slope	0.37
				Somewhat limited Slope	0.37
Sp: Drummond-----	100	Not limited		Very limited Salinity	1.00
				Droughty	0.68
Ta: Tabler-----	100	Not limited		Not limited	
Th: Tivoli-----	100	Very limited Too sandy	1.00	Very limited Droughty	1.00
				Slope	0.63
Vr: Vernon-----	60	Not limited		Very limited Sodium content	1.00
				Droughty	0.15
Renfrow-----	40	Not limited		Not limited	
W: Water-----	100	Not rated		Not rated	
Wa: Kingman-----	100	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Flooding	0.60
Wd: Quinlan-----	50	Not limited		Very limited Depth to bedrock	1.00
				Droughty	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to bedrock	0.42
We: Quinlan-----	50	Not limited		Very limited Depth to bedrock	1.00
				Droughty	1.00
Woodward-----	50	Not limited		Somewhat limited Depth to bedrock	0.90
Ww: Quinlan-----	50	Not limited		Very limited Depth to bedrock	1.00
				Droughty	1.00
Woodward-----	50	Not limited		Somewhat limited	

RECREATIONAL INTERPRETATIONS--Continued
Harper 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
Za: Canadian-----	100	Not limited		Depth to bedrock	0.42
Zf: Zenda-----	100	Not limited		Somewhat limited Flooding	0.60

WILDLIFE INTERPRETATIONS
Harper 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 garden 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
Harper 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
007AE: ALBION-----	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
SHELLABARGER----	Poor	Fair	Good	---	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
007AS: CLAIREMONT-----	Poor	Poor	Poor	---	---	Poor	Poor	Poor	Poor	---	Poor	Poor
007FU: FARNUM-----	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good
007KA: KANZA-----	Very poor	Poor	Fair	---	---	Fair	Fair	Fair	Poor	---	Fair	Fair
095AD: ALBION-----	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
095DA: DILLWYN-----	Poor	Fair	Good	---	---	Fair	Fair	Fair	Fair	---	Fair	Fair
PLEVNA-----	Poor	Fair	Fair	---	---	Fair	Good	Good	Fair	---	Good	Fair
095LA: LINCOLN-----	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
095NB: NASHVILLE-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Very poor	Very poor	Fair	---	Very poor	Poor
095SA: SHELLABARGER----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
095SC: SHELLABARGER----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
095SD: SHELLABARGER----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
095ZA: ZENDA-----	Fair	Good	Good	---	---	Good	Fair	Fair	Good	---	Fair	Good
191EA: ELANDCO-----	Good	Good	Fair	---	---	Good	Poor	Very poor	Good	---	Very poor	Fair
191EC: ELANDCO-----	Very poor	Poor	Fair	---	---	Good	Poor	Very poor	Poor	---	Very poor	Fair
191LS: LINCOLN-----	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
191OP: WELLSFORD-----	Very poor	Very poor	Good	Very poor	Very poor	---	Very poor	Very poor	Very poor	Very poor	Very poor	Good
ELANDCO-----	Very poor	Poor	Fair	---	---	Good	Poor	Very poor	Poor	---	Very poor	Fair
191PD: POND CREEK-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
191RA: RENFROW-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
GRAINOLA-----	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
191TA: TABLER-----	Good	Good	Fair	---	---	Fair	Poor	Poor	Good	---	Poor	Fair

WILDLIFE INTERPRETATIONS--Continued
Harper 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
191US: USTIFLUVENTS----	---	---	---	---	---	---	---	---	---	---	---	---
1439: CRISFIELD-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
An: KASKI-----	Poor	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
At: ATTICA-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Be: BETHANY-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Bh: BETHANY-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Bm: LINCOLN-----	Fair	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Bo: GERLANE-----	Poor	Poor	Fair	Poor	Poor	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Bp: WOODWARD-----	Fair	Good	Good	---	---	Fair	Very poor	Very poor	Good	---	Very poor	Fair
PORT-----	Poor	Fair	Fair	---	---	Good	Poor	Very poor	Fair	---	Very poor	Fair
Br: BROKEN ALLUVIAL LAND-----	Poor	Poor	Fair	Poor	Good	---	Poor	Very poor	Poor	Fair	Very poor	Fair
Ca: CARWILE-----	Fair	Good	Good	---	---	Good	Good	Fair	Good	---	Fair	Good
Cc: CASE-----	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
CLARK-----	Fair	Good	Fair	Fair	Fair	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Ce: CORBIN-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Cf: CORBIN-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Fa: FARNUM-----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Fm: FARNUM-----	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good
Fn: FARNUM-----	Good	Good	Good	---	---	Good	Poor	Poor	Good	---	Poor	Good
Fu: FARNUM-----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Ge: GERLANE-----	Good	Good	Good	---	---	Fair	Poor	Poor	Good	---	Poor	Fair
Gn: GRANT-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Gr: GRANT-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair

WILDLIFE INTERPRETATIONS--Continued
Harper 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
GRP: GRAVEL PITS-----	---	---	---	---	---	---	---	---	---	---	---	---
Gs: GRANT-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
INT: AQUOLLS-----	---	---	---	---	---	---	---	---	---	---	---	---
Ka: KANZA-----	Very poor	Poor	Fair	---	---	Fair	Fair	Fair	Poor	---	Fair	Fair
Kk: KASKI-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Km: KIRKLAND-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Kr: KIRKLAND-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
RENFROW-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Kw: KIRKLAND-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
RENFROW-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Mc: MINCO-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Mn: MINCO-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Mo: MINCO-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Na: NASHVILLE-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Ne: NASHVILLE-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Nh: NASHVILLE-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Nn: NASHVILLE-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
No: NORGE-----	Good	Good	Good	---	---	Fair	Fair	Poor	Good	---	Poor	Fair
Pc: POND CREEK-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Pd: POND CREEK-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Pe: POND CREEK-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Pg: POND CREEK-----	Good	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair

WILDLIFE INTERPRETATIONS--Continued
Harper 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
Ph: DALE-----	Good	Good	Fair	---	---	Good	Poor	Very poor	Good	---	Very poor	Fair
Pk: PORT-----	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Pm: PRATT-----	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Pn: PRATT-----	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Po: PRATT-----	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
CARWILE-----	Fair	Good	Good	---	---	Good	Good	Fair	Good	---	Fair	Good
Pt: PRATT-----	Fair	Good	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
TIVOLI-----	Poor	Poor	Fair	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
Qa: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
Qn: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
Qu: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
Rc: RENFROW-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
VERNON-----	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Re: RUELLA-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Rh: RUELLA-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Ru: RUELLA-----	Fair	Good	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
Sa: LESHO-----	Fair	Fair	Good	---	---	Fair	Fair	Fair	Fair	---	Fair	Fair
Sb: SHELLABARGER----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Se: SHELLABARGER----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Sf: SHELLABARGER----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Sg: SHELLABARGER----	Fair	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Sh: ZELLMONT-----	Good	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Poor	Very poor	Good

WILDLIFE INTERPRETATIONS--Continued
Harper 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
SHH: SHELLABARGER----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Sk: ZELLMONT-----	Good	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Poor	Very poor	Good
Sm: ZELLMONT-----	Good	Good	Good	Fair	Fair	Good	Poor	Very poor	Good	Poor	Very poor	Good
Sn: SHELLABARGER----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
So: SHELLABARGER----	Poor	Fair	Good	---	---	Good	Very poor	Very poor	Fair	---	Very poor	Good
ALBION-----	Poor	Fair	Fair	---	---	Fair	Very poor	Very poor	Fair	---	Very poor	Fair
Sp: DRUMMOND-----	Poor	Fair	Fair	---	Poor	Poor	Fair	Fair	Fair	---	Fair	Poor
Ta: TABLER-----	Good	Good	Fair	---	---	Fair	Poor	Poor	Good	---	Poor	Fair
Th: TIVOLI-----	Poor	Poor	Fair	---	---	Poor	Very poor	Very poor	Poor	---	Very poor	Poor
Vr: VERNON-----	Fair	Fair	Fair	---	---	Fair	Poor	Very poor	Fair	---	Very poor	Fair
RENFROW-----	Good	Good	Fair	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
W: WATER-----	---	---	---	---	---	---	---	---	---	---	---	---
Wa: KINGMAN-----	Poor	Fair	Good	---	---	Fair	Fair	Fair	Fair	---	Fair	Fair
Wd: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WOODWARD-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
We: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WOODWARD-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Ww: QUINLAN-----	Poor	Poor	Fair	---	---	Poor	Poor	Very poor	Fair	---	Very poor	Poor
WOODWARD-----	Fair	Good	Good	---	---	Fair	Poor	Very poor	Good	---	Very poor	Fair
Za: CANADIAN-----	Good	Good	Good	---	---	Good	Poor	Very poor	Good	---	Very poor	Good
Zf: ZENDA-----	Fair	Good	Good	---	---	Good	Fair	Fair	Good	---	Fair	Good

YIELDS PER ACRE OF PASTURE AND HAYLAND
Harper 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. One 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		Alfalfa hay	
	N	I	N	I
			Tons	Tons
007AE: Albion-----	6e	---	---	---
Shellabarger-----	6e	---	---	---
007AS: Clairemont-----	6s	---	---	---
007FU: Farnum-----	3e	---	2.50	---
007KA: Kanza-----	5w	---	---	---
095AD: Albion-----	6e	---	---	---
095DA: Dillwyn-----	4w	---	---	---
Plevna-----	5w	---	---	---
095LA: Lincoln-----	6w	---	---	---
095NB: Nashville-----	4e	---	---	---
Quinlan-----	6e	---	---	---
095SA: Shellabarger-----	2e	---	2.20	6.50
095SC: Shellabarger-----	3e	---	2.00	6.00
095SD: Shellabarger-----	3e	---	1.50	5.50
095ZA: Zenda-----	2w	---	4.00	5.50
191EA: Elandco-----	2w	---	---	---
191EC: Elandco-----	5w	---	---	---
191LS: Lincoln-----	6w	---	---	---
191OP: Wellsford-----	6e	---	---	---
Elandco-----	5w	---	---	---
191PD: Pond Creek-----	3e	---	---	---
191RA: Renfrow-----	3e	---	---	---
Grainola-----	3e	---	---	---
191TA: Tabler-----	2s	---	---	---
191US: Ustifluvents-----	---	---	---	---
1439: Crisfield-----	3s	---	2.50	---
An: Kaski-----	5w	---	---	---
At: Attica-----	2e	---	3.00	6.50

(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		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Be: Bethany-----	1	---	3.50	---
Bh: Bethany-----	2e	---	---	---
Bm: Lincoln-----	4s	---	---	---
Bo: Gerlane-----	5w	---	---	---
Bp: Woodward-----	6e	---	---	---
Port-----	5w	---	---	---
Br: Broken Alluvial Land----	6w	---	---	---
Ca: Carwile-----	2w	---	---	---
Cc: Case-----	4e	---	---	---
Clark-----	4e	---	---	---
Ce: Corbin-----	1	---	---	---
Cf: Corbin-----	2e	---	---	---
Fa: Farnum-----	4e	---	---	---
Fm: Farnum-----	2c	1	3.00	7.00
Fn: Farnum-----	2e	2e	3.00	6.50
Fu: Farnum-----	3e	---	3.00	---
Ge: Gerlane-----	2e	---	3.40	---
Gn: Grant-----	1	---	2.80	---
Gr: Grant-----	2e	---	2.30	---
GRP: Gravel Pits-----	---	---	---	---
Gs: Grant-----	3e	---	2.00	---
INT: Aguolls-----	5w	---	---	---
Ka: Kanza-----	5w	---	---	---
Kk: Kaski-----	2w	---	3.00	6.50
Km: Kirkland-----	2s	---	---	---
Kr: Kirkland-----	3e	---	---	---
Renfrow-----	3e	---	---	---
Kw: Kirkland-----	4e	---	---	---

(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		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Renfrow-----	3e	---	---	---
Mc: Minco-----	1	---	3.50	---
Mn: Minco-----	2e	---	3.00	---
Mo: Minco-----	3e	---	2.50	---
Na: Nashville-----	2s	---	---	---
Ne: Nashville-----	2e	---	---	---
Nh: Nashville-----	3e	---	---	---
Nn: Nashville-----	4e	---	---	---
No: Norge-----	2e	2e	---	6.50
Pc: Pond Creek-----	1	---	3.50	---
Pd: Pond Creek-----	2e	---	3.00	---
Pe: Pond Creek-----	3e	---	---	---
Pg: Pond Creek-----	3e	---	---	---
Ph: Dale-----	1	---	5.50	---
Pk: Port-----	3s	---	---	---
Pm: Pratt-----	4e	3e	---	5.50
Pn: Pratt-----	4e	3e	---	5.50
Po: Pratt-----	4e	3e	---	5.50
Carwile-----	2w	---	---	---
Pt: Pratt-----	6e	---	---	---
Tivoli-----	7e	---	---	---
Qa: Quinlan-----	3e	---	---	---
Qn: Quinlan-----	3e	---	---	---
Qu: Quinlan-----	4e	---	---	---
Rc: Renfrow-----	3e	---	---	---
Vernon-----	4e	4e	---	---
Re: Ruella-----	2c	---	---	---
Rh: Ruella-----	2e	---	---	---

(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		Alfalfa hay	
	N	I	N	I
			Tons	Tons
Ru: Ruella-----	3e	---	---	---
Sa: Lesho-----	6s	4s	2.00	4.00
Sb: Shellabarger-----	2e	---	2.50	7.00
Se: Shellabarger-----	2e	---	2.20	6.50
Sf: Shellabarger-----	3e	---	2.00	6.00
Sg: Shellabarger-----	3e	---	2.00	6.00
Sh: Zellmont-----	2e	---	2.20	6.50
SHH: Shellabarger-----	2e	---	2.20	6.50
Sk: Zellmont-----	3e	---	2.20	6.50
Sm: Zellmont, eroded-----	3e	---	2.20	6.50
Sn: Shellabarger-----	2e	---	2.20	6.50
So: Shellabarger-----	6e	---	---	---
Albion-----	6e	---	---	---
Sp: Drummond-----	6s	---	---	---
Ta: Tabler-----	2s	---	---	---
Th: Tivoli-----	7e	---	---	---
Vr: Vernon-----	4e	4e	---	---
Renfrow-----	4e	---	---	---
W: Water-----	---	---	---	---
Wa: Kingman-----	5w	---	---	---
Wd: Quinlan-----	3e	---	---	---
Woodward-----	2e	---	---	---
We: Quinlan-----	3e	---	---	---
Woodward-----	2e	---	---	---
Ww: Quinlan-----	4e	---	---	---
Woodward-----	3e	---	---	---
Za: Canadian-----	2e	---	3.50	---
Zf: Zenda-----	2w	---	4.00	5.50

CONSERVATION TREE AND SHRUB MANAGEMENT
Harper 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. Unsited 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 unsited 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 unsited 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 unsited 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
Harper 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
007AE: Albion-----	6G	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
007AS: Clairemont-----	1K	Well suited	Well suited	Well suited	Well suited	High Salinity Soil reaction
007FU: Farnum-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
007KA: Kanza-----	2	Well suited	Well suited	Well suited	Well suited	Low
095AD: Albion-----	6G	Well suited	Moderately suited Slope	Well suited	Well suited	Low
095DA: Dillwyn-----	1	Well suited	Well suited	Well suited	Well suited	Low
Plevna-----	2	Well suited	Well suited	Well suited	Unsuited Wetness	High Wetness
095LA: Lincoln-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
095NB: Nashville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Quinlan-----	10	Well suited	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
095SA: Shellabarger-----	5	Well suited	Well suited	Well suited	Well suited	Low
095SC: Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
095SD: Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
095ZA: Zenda-----	1	Well suited	Well suited	Well suited	Well suited	Low
191EA: Elandco-----	1	Well suited	Well suited	Well suited	Well suited	Low
191EC: Elandco-----	1	Well suited	Well suited	Well suited	Well suited	Low
191LS: Lincoln-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
191OP: Wellsford-----		Moderately suited Stickiness	Moderately suited Stickiness Slope	Poorly suited Stickiness	Well suited	Low
Elandco-----	1	Well suited	Well suited	Well suited	Well suited	Low
191PD: Pond Creek-----	3	Well suited	Well suited	Well suited	Well suited	Low
191RA: Renfrow-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Grainola-----		Moderately suited Stickiness	Moderately suited Stickiness Rock fragments	Poorly suited Stickiness	Well suited	Low
191TA: Tabler-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
191US: Ustifluvents-----		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

CONSERVATION TREE AND SHRUB MANAGEMENT
Harper 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
1439: Crisfield-----	5	Well suited	Slope Well suited	Slope Well suited	Slope Well suited	Low
An: Kaski-----	1	Well suited	Well suited	Well suited	Well suited	Low
At: Attica-----	5	Well suited	Well suited	Well suited	Well suited	Low
Be: Bethany-----	4C	Well suited	Well suited	Well suited	Well suited	Low
Bh: Bethany-----	4C	Well suited	Well suited	Well suited	Well suited	Low
Bm: Lincoln-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Bo: Gerlane-----	1	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Bp: Woodward-----	8	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Port-----	1	Well suited	Well suited	Well suited	Well suited	Low
Br: Broken Alluvial Land		Well suited	Moderately suited Slope	Poorly suited Slope	Poorly suited Slope	Low
Ca: Carwile-----	1	Well suited	Well suited	Well suited	Well suited	High Wetness
Cc: Case-----	8	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction
Clark-----	8	Well suited	Well suited	Well suited	Well suited	Moderate Lime Soil reaction
Ce: Corbin-----	3	Well suited	Well suited	Well suited	Well suited	Low
Cf: Corbin-----	3	Well suited	Well suited	Well suited	Well suited	Low
Fa: Farnum-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Fm: Farnum-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Fn: Farnum-----	3	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Fu: Farnum-----	3	Moderately suited Stickiness	Moderately suited Slope Stickiness	Well suited	Well suited	Low
Ge: Gerlane-----	1	Well suited	Well suited	Well suited	Well suited	Low
Gn: Grant-----	3	Well suited	Well suited	Well suited	Well suited	Low
Gr: Grant-----	3	Well suited	Well suited	Well suited	Well suited	Low
GRP: Gravel Pits-----		Not rated	Not rated	Not rated	Not rated	Not rated
Gs: Grant-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
INT: Aguolls-----		Moderately suited Rock fragments	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	High Wetness Soil reaction
Ka: Kanza-----	2	Well suited	Well suited	Well suited	Well suited	Low
Kk: Kaski-----	1	Well suited	Well suited	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Harper 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
Km: Kirkland-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Kr: Kirkland-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Renfrow-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Kw: Kirkland-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Renfrow-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Mc: Minco-----	3	Well suited	Well suited	Well suited	Well suited	Low
Mn: Minco-----	3	Well suited	Well suited	Well suited	Well suited	Low
Mo: Minco-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Na: Nashville-----	6D	Well suited	Well suited	Well suited	Well suited	Low
Ne: Nashville-----	6D	Well suited	Well suited	Well suited	Well suited	Low
Nh: Nashville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Nn: Nashville-----	6D	Well suited	Moderately suited Slope	Well suited	Well suited	Low
No: Norge-----	3	Well suited	Well suited	Well suited	Well suited	Low
Pc: Pond Creek-----	3	Well suited	Well suited	Well suited	Well suited	Low
Pd: Pond Creek-----	3	Well suited	Well suited	Well suited	Well suited	Low
Pe: Pond Creek-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Pg: Pond Creek-----	3	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Ph: Dale-----	1	Well suited	Well suited	Well suited	Well suited	Low
Pk: Port-----	9L	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction Salinity
Pm: Pratt-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Pn: Pratt-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Po: Pratt-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Carwile-----	1	Well suited	Well suited	Well suited	Well suited	High Wetness
Pt: Pratt-----	7	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Tivoli-----	7	Moderately suited Sandiness	Moderately suited Slope Sandiness	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Harper 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
Qa: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Qn: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Qu: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments Slope	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Rc: Renfrow-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Vernon-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction
Re: Ruella-----	8	Moderately suited Restrictive layer	Well suited	Well suited	Well suited	Moderate Soil reaction
Rh: Ruella-----	8	Moderately suited Restrictive layer	Well suited	Well suited	Well suited	Moderate Soil reaction
Ru: Ruella-----	8	Moderately suited Restrictive layer	Moderately suited Slope	Well suited	Well suited	Moderate Soil reaction
Sa: Lesho-----	1K	Well suited	Well suited	Well suited	Well suited	Moderate Soil reaction Salinity
Sb: Shellabarger-----	5	Well suited	Well suited	Well suited	Well suited	Low
Se: Shellabarger-----	5	Well suited	Well suited	Well suited	Well suited	Low
Sf: Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sg: Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sh: Zellmont-----	6	Well suited	Well suited	Well suited	Well suited	Low
SHH: Shellabarger-----	5	Well suited	Well suited	Well suited	Well suited	Low
Sk: Zellmont-----	6	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sm: Zellmont, eroded----	6	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Sn: Shellabarger-----	5	Well suited	Well suited	Well suited	Well suited	Low
So: Shellabarger-----	5	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Albion-----	6G	Well suited	Moderately suited Slope	Well suited	Well suited	Low

CONSERVATION TREE AND SHRUB MANAGEMENT
Harper 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
Sp: Drummond-----	9W	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	High Salinity Soil reaction
Ta: Tabler-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
Th: Tivoli-----	7	Moderately suited Sandiness	Moderately suited Slope Sandiness	Well suited	Well suited	Low
Vr: Vernon-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Poorly suited Stickiness	Well suited	Moderate Soil reaction
Renfrow-----	4C	Moderately suited Stickiness	Moderately suited Stickiness	Well suited	Well suited	Low
W: Water-----		Not rated	Not rated	Not rated	Not rated	Not rated
Wa: Kingman-----	2	Well suited	Well suited	Well suited	Well suited	High Wetness Soil reaction
Wd: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Woodward-----	8	Well suited	Well suited	Well suited	Well suited	Low
We: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Woodward-----	8	Well suited	Well suited	Well suited	Well suited	Low
Ww: Quinlan-----	10	Moderately suited Rock fragments Restrictive layer	Poorly suited Rock fragments Slope	Poorly suited Rock fragments	Well suited	Moderate Soil reaction
Woodward-----	8	Well suited	Moderately suited Slope	Well suited	Well suited	Low
Za: Canadian-----	1	Well suited	Well suited	Well suited	Well suited	Low
Zf: Zenda-----	1	Well suited	Well suited	Well suited	Well suited	Low

ENGINEERING INDEX PROPERTIES
Harper 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
Harper 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						
007AE: Albion-----	0-8	Sandy loam	ML, SM, CL-ML	A-2, A-4	0	0	100	75-100	60-90	25-55	15-30	NP-5
	8-16	Sandy loam	ML, SM, CL-ML	A-2, A-4	0	0	85-100	75-100	45-90	30-55	20-35	NP-10
	16-27	Loamy sand	SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	15-30	NP-5
	27-60	Sand	GM, GP-GM, SM, SP-SM	A-1, A-2, A-3	0	0-5	40-100	40-90	30-70	5-30	15-30	NP-5
Shellabarger---	0-14	Sandy loam	ML, SM	A-2, A-4	0	0	95-100	95-100	75-100	30-55	15-30	NP-5
	14-48	Sandy clay loam	SC	A-4, A-6	0	0	95-100	85-100	70-90	35-50	25-40	8-20
	48-60	Coarse sandy loam	SC, SC-SM, SM, SP-SM	A-2, A-4	0	0	80-100	70-100	50-80	10-40	15-30	NP-10
007AS: Clairemont----	0-8	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	98-100	85-100	65-95	22-40	5-20
	8-60	Loam	CL, CL-ML	A-4, A-6, A- 7-6	0	0	100	98-100	90-100	65-95	22-45	5-25
007FU: Farnum-----	0-9	Clay loam	CL	A-6	0	0	100	100	90-100	60-85	30-40	10-20
	9-60	Clay loam	CL, SC	A-6, A-7-6	0	0	100	100	70-100	45-80	35-50	15-30
007KA: Kanza-----	0-7	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	95-100	90-100	5-35	---	NP
	7-48	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	90-100	90-100	80-100	5-35	---	NP
095AD: Albion-----	0-8	Sandy loam	ML, SM	A-2, A-4	0	0	100	75-100	60-90	25-55	15-30	NP-5
	8-16	Sandy loam	ML, SM	A-2, A-4	0	0	85-100	75-100	45-90	30-55	20-35	NP-10
	16-26	Coarse sandy loam	SM	A-1, A-2	0	0	85-100	75-90	40-70	15-30	15-30	NP-5
	26-60	Gravelly sand	GM, GP-GM, SM, SP-SM	A-1, A-2, A-3	0	0-5	40-100	40-90	30-70	5-30	15-30	NP-5
095DA: Dillwyn-----	0-8	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	95-100	70-90	5-35	---	NP
	8-60	Loamy fine sand	SM, SP-SM	A-2, A-3	0	0	100	90-100	70-90	5-35	---	NP
Plevna-----	0-11	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	70-100	20-50	15-26	NP-6
	11-36	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	100	95-100	70-100	30-50	15-26	NP-6
	36-60	Sand	SM, SP	A-2, A-3	0	0	100	90-100	50-90	4-35	---	NP
095LA: Lincoln-----	0-10	Loamy fine sand	SM	A-2	0	0	100	98-100	90-100	15-35	---	NP
	10-60	Stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	5-35	---	NP
095NB: Nashville-----	0-28	Silt loam	CL, CL-ML, ML	A-4	0	0	100	100	95-100	85-100	20-35	2-10
	>28	Weathered bedrock			---	---	---	---	---	---	---	---
Quinlan-----	0-13	Loam	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	51-97	15-37	NP-14
	>13	Weathered bedrock			---	---	---	---	---	---	---	---
095SA: Shellabarger---	0-12	Loamy sand	SM	A-2	0	0	95-100	95-100	70-100	15-35	---	NP
	12-38	Sandy clay loam	SC	A-4, A-6	0	0	95-100	85-100	70-90	35-50	25-40	8-20
	38-60	Fine sandy loam	SC, SC-SM, SM, SP-SM	A-2, A-4	0	0	80-100	70-100	50-80	10-40	15-30	NP-10
095SC: Shellabarger---	0-10	Sandy loam	ML, SM	A-2, A-4	0	0	95-100	95-100	75-100	30-55	15-30	NP-5
	10-45	Sandy clay loam	SC	A-4, A-6	0	0	95-100	85-100	70-90	35-50	25-40	8-20
	45-60	Coarse sandy loam	SC, SC-SM, SM, SP-SM	A-2, A-4	0	0	80-100	70-100	50-80	10-40	15-30	NP-10
095SD: Shellabarger---	0-10	Sandy loam	ML, SM	A-2, A-4	0	0	95-100	95-100	75-100	30-55	15-30	NP-5
	10-45	Sandy clay loam	SC	A-4, A-6	0	0	95-100	85-100	70-90	35-50	25-40	8-20
	45-60	Coarse sandy loam	SC, SC-SM, SM, SP-SM	A-2, A-4	0	0	80-100	70-100	50-80	10-40	15-30	NP-10
095ZA: Zenda-----	0-13	Clay loam	CL	A-6	0	0	100	95-100	85-100	55-80	30-40	10-20
	13-60	Clay loam	CL	A-6	0	0	100	95-100	85-100	55-80	25-40	10-25
191EA: Elandco-----	0-40	Silty clay loam	CL	A-4, A-6, A- 7-6	0	0	100	100	95-100	85-95	25-45	8-25
	40-62	Silty clay loam	CL, CL-ML, ML	A-4, A-6, A- 7-6	0	0	100	100	95-100	65-95	20-45	4-25
191EC: Elandco-----	0-40	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-95	20-40	4-20
	40-62	Silty clay loam	CL, CL-ML, ML	A-4, A-6, A- 7-6	0	0	100	100	95-100	65-95	20-45	4-25
191LS: Lincoln-----	0-11	Loamy fine sand	SM	A-2	0	0	100	98-100	90-100	15-35	---	NP
	11-60	Stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	5-35	---	NP
191OP: Wellsford-----	0-5	Clay loam	CL	A-6, A-7-6	---	0-5	95-100	95-100	90-100	75-95	35-50	15-30
	5-17	Clay	CH, CL, MH	A-7-6	---	0-5	95-100	95-100	85-100	75-95	45-70	20-40
	17-21	Weathered bedrock			---	---	---	---	---	---	---	---
Elandco-----	0-40	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	95-100	85-95	20-40	4-20
	40-62	Silty clay loam	CL, CL-ML, ML	A-4, A-6, A- 7-6	0	0	100	100	95-100	65-95	20-45	4-25
191PD: Pond Creek-----	0-12	Silty clay loam	CL	A-6	0	0	100	100	96-100	85-98	30-40	11-20
	12-68	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	30-43	8-20

ENGINEERING INDEX PROPERTIES--Continued
Harper 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	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
191RA: Renfrow-----	0-9	Clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-49	12-26
	9-13	Silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	37-49	15-26
	13-75	Silty clay loam	CH, CL, MH	A-6, A-7	0	0	100	100	96-100	80-99	37-70	15-38
Grainola-----	0-8	Silt loam	CL	A-4, A-6	---	0-15	90-100	85-95	80-90	51-80	30-37	8-14
	8-28	Silty clay	CH, CL, MH	A-7	---	0-15	90-100	70-100	70-95	60-90	41-70	20-40
	28-36	Clay	CH, CL, GC, SC, MH	A-2, A-7	0	0	25-95	20-90	20-90	15-90	41-70	20-40
	36-42	Weathered bedrock			---	---	---	---	---	---	---	---
191TA: Tabler-----	0-10	Silty clay loam	CL	A-7, A-6	0	0	100	100	96-100	80-98	32-43	11-20
	10-30	Silty clay	CH, CL, MH	A-7	0	0	100	100	96-100	90-99	41-65	18-35
	30-60	Silty clay	CH, CL, MH	A-6, A-7	0	0	96-100	96-100	92-100	80-99	38-60	15-35
191US: Ustifluvents---	---	---	---	---	---	---	---	---	---	---	---	---
1439: Crisfield-----	0-12	Sandy loam	SC, SM	A-6, A-2-6, A-4	0	0	95-100	95-100	65-75	30-45	10-20	NP-12
	12-24	Sandy loam	SC, SM	A-6, A-2-6, A-4	0	0	100	95-100	70-75	30-60	10-20	NP-12
	24-80	Coarse sand	SP-SM	A-3, A-1-b, A-2-4	0	0	95-100	90-100	45-55	5-40	0-5	NP-2
An: Kaski-----	0-26	Loam	CL, CL-ML	A-4, A-6, A-7	0	0	100	100	85-100	50-85	20-45	5-25
	26-40	Clay loam	CL, SC	A-4, A-6, A-7	0	0	100	95-100	85-100	45-85	25-45	7-25
	40-60	Sandy loam	CL, ML, SC, SM	A-2, A-4, A-6	0	0	100	95-100	60-100	30-80	15-35	NP-20
At: Attica-----	0-10	Fine sandy loam	SM	A-2, A-4	0	0	100	95-100	70-100	20-50	15-20	NP-4
	10-39	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	95-100	75-100	30-55	15-26	NP-7
	39-60	Fine sandy loam	SC-SM, SM	A-2, A-4	0	0	85-100	80-100	70-100	20-50	15-26	NP-7
Be: Bethany-----	0-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	80-98	21-37	2-13
	13-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	15-26
	17-60	Silty clay loam	CH, CL	A-6, A-7	0	0	100	96-100	96-100	90-99	37-60	15-33
Bh: Bethany-----	0-13	Silt loam	CL, CL-ML, ML	A-4, A-6	0	0	100	100	96-100	80-98	21-37	2-13
	13-17	Silty clay loam	CL	A-6, A-7	0	0	100	100	96-100	80-98	33-50	15-26
	17-60	Silty clay loam	CH, CL	A-6, A-7	0	0	100	96-100	96-100	90-99	37-60	15-33
Bm: Lincoln-----	0-21	Loamy fine sand	SM	A-2	0	0	100	98-100	90-100	15-35	---	NP
	21-60	Stratified fine sand to clay loam	SM, SP-SM	A-2, A-3	0	0	100	98-100	82-100	5-35	---	NP
Bo: Gerlane-----	0-4	Loamy fine sand	SM	A-2	0	0	100	95-100	90-100	15-35	---	NP
	4-30	Stratified loamy sand to fine sandy loam	SM, SP-SM	A-2, A-3	0	0	100	95-100	80-100	5-35	---	NP
	30-60	Clay	CH	A-7	0	0	100	100	90-100	75-95	50-70	30-45
Bp: Woodward-----	0-24	Silt loam	CL, CL-ML, ML	A-6, A-4	0	0	100	100	90-100	51-95	15-31	NP-12
	>24	Weathered bedrock			---	---	---	---	---	---	---	---
Port-----	0-27	Silt loam	CL	A-4, A-6	0	0	100	100	96-100	65-97	27-37	8-14
	27-60	Silty clay loam	CL	A-4, A-6, A-7	0	0	100	100	96-100	65-98	27-43	8-20
Br: Broken Alluvial Land-----	0-6	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-90	20-35	5-15
	6-60	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	85-100	60-95	20-40	5-20
Ca: Carwile-----	0-14	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	98-100	90-100	36-60	15-26	NP-7
	14-20	Sandy clay loam	CL, SC	A-6, A-7	0	0	100	100	90-100	36-90	35-50	14-26
	20-60	Clay	CH, CL, SC	A-6, A-7	0	0	100	100	90-100	40-95	35-70	14-38
Cc: Case-----	0-7	Clay loam	CL	A-6	0	0	90-100	90-100	85-100	55-85	30-40	10-20
	7-60	Clay loam	CL	A-6, A-7-6	0	0	90-100	90-100	85-100	55-85	25-45	10-25
Clark-----	0-8	Loam	CL, CL-ML	A-4, A-6	0	0	100	95-100	90-100	50-90	20-40	5-20
	8-60	Clay loam	CL	A-6	0	0	100	95-100	90-100	55-90	25-40	10-25
Ce: Corbin-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-35	5-15
	16-30	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	30-55	Clay	CH, CL	A-7-6	0	0	100	100	95-100	90-100	45-60	25-35
	55-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-45	12-20
Cf: Corbin-----	0-16	Silt loam	CL, CL-ML	A-4, A-6	0	0	100	100	90-100	75-100	25-35	5-15
	16-30	Silty clay loam	CL, ML	A-6, A-7	0	0	100	100	95-100	85-100	35-45	10-20
	30-55	Clay	CH, CL, MH	A-7-6	0	0	100	100	95-100	90-100	45-60	25-35
	55-60	Silty clay loam	CL	A-6, A-7	0	0	100	100	95-100	85-100	35-45	12-20
Fa: Farnum-----	0-7	Clay loam	CL	A-6	0	0	100	100	90-100	60-85	30-40	10-20
	7-41	Clay loam	CL, SC	A-6, A-7-6	0	0	100	100	70-100	45-80	35-50	15-30
	41-60	Clay loam	CL, CL-ML, SC, SC-SM	A-2, A-4, A-6	0	0	100	95-100	65-100	30-80	20-35	5-15

ENGINEERING INDEX PROPERTIES--Continued
Harper County, Kansas

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Map symbol and soil name	Depth In	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit Pct	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
Fm: Farnum-----	0-11 11-41 41-60	Loam Clay loam Clay loam	CL, CL-ML CL, SC CL, CL-ML, SC, SC-SM	A-4, A-6 A-6, A-7-6 A-2, A-4, A-6	0 0 0	0 0 0	100 100 100	100 100 95-100	90-100 70-100 65-100	60-85 45-80 30-80	20-35 35-50 20-35	5-15 15-30 5-15
Fn: Farnum-----	0-11 11-41 41-60	Loam Clay loam Clay loam	CL, CL-ML CL, SC CL, CL-ML, SC, SC-SM	A-4, A-6 A-6, A-7-6 A-2, A-4, A-6	0 0 0	0 0 0	100 100 100	100 100 95-100	90-100 70-100 65-100	60-85 45-80 30-80	20-35 35-50 20-35	5-15 15-30 5-15
Fu: Farnum-----	0-11 11-41 41-60	Loam Clay loam Clay loam	CL, CL-ML CL, SC CL, CL-ML, SC, SC-SM	A-4, A-6 A-6, A-7-6 A-2, A-4, A-6	0 0 0	0 0 0	100 100 100	100 100 95-100	90-100 70-100 65-100	60-85 45-80 30-80	20-35 35-50 20-35	5-15 15-30 5-15
Ge: Gerlane-----	0-17 17-40 40-48 48-60	Fine sandy loam Fine sandy loam Loamy sand Clay loam	CL-ML, ML, SC-SM, SM CL-ML, ML, SC-SM, SM CL-ML, ML, SC-SM, SM CL, CL-ML	A-4 A-4 A-2, A-4 A-4, A-6	0 0 0 0	0 0 0 0	100 100 100 100	95-100 95-100 95-100 100	70-95 70-95 70-95 95-100	40-55 35-55 15-55 65-95	15-26 15-26 15-26 20-40	NP-6 NP-6 NP-6 5-25
Gn: Grant-----	0-11 11-33 33-50 >50	Silt loam Silty clay loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, ML CL, CL-ML, ML ---	A-4 A-4, A-6, A-7 A-4 ---	0 0 0 ---	0 0 0 ---	100 100 70-100 ---	100 100 70-100 ---	90-100 90-100 65-100 ---	70-90 70-90 55-90 ---	20-32 30-42 20-32 ---	1-10 8-19 1-10 ---
Gr: Grant-----	0-11 11-33 33-50 >50	Silt loam Silty clay loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, ML CL, CL-ML, ML ---	A-4 A-4, A-6, A-7 A-4 ---	0 0 0 ---	0 0 0 ---	100 100 70-100 ---	100 100 70-100 ---	90-100 90-100 65-100 ---	70-90 70-90 55-90 ---	20-32 30-42 20-32 ---	1-10 8-19 1-10 ---
GRP: Gravel Pits---	---	---	---	---	---	---	---	---	---	---	---	---
Gs: Grant-----	0-11 11-33 33-50 50-60	Silt loam Silty clay loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, ML CL, CL-ML, ML ---	A-4 A-7, A-4, A-6 A-4 ---	0 0 0 ---	0 0 0 ---	100 100 70-100 ---	100 100 70-100 ---	90-100 90-100 65-100 ---	70-90 70-90 55-90 ---	20-32 30-42 20-32 ---	1-10 8-19 1-10 ---
INT: Aquolls-----	0-60	Variable	---	---	---	---	---	---	---	---	---	---
Ka: Kanza-----	0-8 8-60	Loamy fine sand Loamy fine sand	SM, SP-SM SM, SP-SM	A-2, A-3 A-2, A-3	0 0	0 0	100 90-100	95-100 90-100	90-100 80-100	5-35 5-35	---	NP NP
Kk: Kaski-----	0-19 19-40 40-60	Loam Loam Sandy loam	CL, CL-ML CL, SC CL, ML, SC, SM	A-4, A-6, A-7 A-4, A-6, A-7 A-2, A-4, A-6	0 0 0	0 0 0	100 100 100	100 95-100 95-100	85-100 85-100 60-100	50-85 45-85 30-80	20-45 25-45 15-35	5-25 7-25 NP-20
Km: Kirkland-----	0-12 12-34 34-60	Silt loam Silty clay Clay	CL, CL-ML, ML CH, CL CH, CL	A-4 A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	96-100 96-100 96-100	80-97 88-99 76-99	22-30 41-65 37-65	2-10 18-38 15-38
Kr: Kirkland-----	0-12 12-34 34-60	Clay loam Silty clay Clay	CL CH, CL, MH CH, CL, MH	A-4, A-6, A-7 A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	96-100 96-100 96-100	80-98 88-99 76-99	30-43 41-65 37-65	8-18 18-38 15-38
Renfrow-----	0-9 9-13 13-60	Clay loam Clay loam Clay	CL CL CH, CL, MH	A-6, A-7 A-6, A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	96-100 96-100 96-100	80-98 80-98 80-99	33-49 37-49 37-70	12-26 15-26 15-38
Kw: Kirkland-----	0-6 6-34 34-60	Clay loam Silty clay Clay	CL CH, CL CH, CL	A-4, A-6, A-7 A-7 A-6, A-7	0 0 0	0 0 0	100 100 100	100 100 100	96-100 96-100 96-100	80-98 88-99 76-99	30-43 41-65 37-65	8-18 18-38 15-38
Renfrow-----	0-6 6-60	Clay loam Clay	CL CH, CL	A-6, A-7 A-6, A-7	0 0	0 0	100 100	100 100	96-100 96-100	80-98 80-99	33-49 37-70	12-26 15-38
Mc: Minco-----	0-42 42-60	Silt loam Silt loam	CL, CL-ML, ML CL, ML, SC, SM	A-4 A-4	0 0	0 0	100 100	100 98-100	94-100 94-100	51-97 36-97	15-31 15-31	NP-10 NP-10
Mn: Minco-----	0-42 42-60	Silt loam Silt loam	CL, CL-ML, ML CL, ML, SC, SM	A-4 A-4	0 0	0 0	100 100	100 98-100	94-100 94-100	51-97 36-97	15-31 15-31	NP-10 NP-10
Mo: Minco-----	0-42 42-60	Silt loam Silt loam	CL, CL-ML, ML CL, ML, SC, SM	A-4 A-4	0 0	0 0	100 100	100 98-100	94-100 94-100	51-97 36-97	15-31 15-31	NP-10 NP-10
Na: Nashville-----	0-12 12-30 >30	Silt loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, CL-ML, ML ---	A-4 A-4 ---	0 0 ---	0 0 ---	100 100 ---	100 100 ---	95-100 95-100 ---	85-100 85-100 ---	20-35 20-35 ---	2-10 2-10 ---

ENGINEERING INDEX PROPERTIES--Continued
Harper 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	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
Ne: Nashville-----	0-12 12-30 >30	Silt loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, CL-ML, ML	A-4 A-4	0 0	0	100 100	100 100	95-100 95-100	85-100 85-100	20-35 20-35	2-10 2-10
Nh: Nashville-----	0-12 12-30 30-60	Silt loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, CL-ML, ML	A-4 A-4	0 0	0	100 100	100 100	95-100 95-100	85-100 85-100	20-35 20-35	2-10 2-10
Nn: Nashville-----	0-7 7-30 >30	Silt loam Silt loam Weathered bedrock	CL, CL-ML, ML CL, CL-ML, ML	A-4 A-4	0 0	0	100 100	100 100	95-100 95-100	85-100 85-100	20-35 20-35	2-10 2-10
No: Norge-----	0-10 10-60	Loam Clay loam	CL, CL-ML CH, CL, MH, SC	A-4, A-6 A-6, A-7-6	0 0	0	95-100 95-100	95-100 95-100	95-100 65-100	65-85 45-80	20-35 35-55	5-15 11-25
Pc: Pond Creek-----	0-13 13-60	Silt loam Silty clay loam	CL, CL-ML, ML CL	A-4, A-6 A-4, A-6, A-7	0 0	0	100 100	100 100	96-100 96-100	65-97 65-98	22-37 30-43	3-14 8-20
Pd: Pond Creek-----	0-13 13-60	Silt loam Silty clay loam	CL, CL-ML, ML CL	A-4, A-6 A-4, A-6, A-7	0 0	0	100 100	100 100	96-100 96-100	65-97 65-98	22-37 30-43	3-14 8-20
Pe: Pond Creek-----	0-13 13-60	Silt loam Silty clay loam	CL, CL-ML, ML CL	A-4, A-6 A-4, A-6, A-7	0 0	0	100 100	100 100	96-100 96-100	65-97 65-98	22-37 30-43	3-14 8-20
Pg: Pond Creek-----	0-8 8-60	Silt loam Silty clay loam	CL, CL-ML, ML CL	A-4, A-6 A-4, A-6, A-7	0 0	0	100 100	100 100	96-100 96-100	65-97 65-98	22-37 30-43	3-14 8-20
Ph: Dale-----	0-22 22-60	Silt loam Silt loam	CL, CL-ML CL	A-4, A-6 A-4, A-6, A-7	0 0	0	95-100 95-100	95-100 95-100	90-100 90-100	65-98 65-98	25-35 30-43	5-15 8-20
Pk: Port-----	0-22 22-44 44-60	Silt loam Silt loam Silty clay loam	CL, CL-ML CL CL	A-4, A-6 A-4, A-6, A-7 A-7, A-4, A-6	0 0 0	0	100 100 100	100 100 100	90-100 90-100 90-100	80-100 85-100 85-100	25-35 30-50 30-50	5-15 8-25 8-25
Pm: Pratt-----	0-12 12-36 36-60	Loamy fine sand Loamy fine sand Fine sand	SM SC-SM, SM SM, SP-SM	A-2 A-2, A-4 A-2, A-3	0 0 0	0	100 100 100	95-100 95-100 95-100	70-100 90-100 80-100	15-35 15-40 5-35	---	NP NP-6 NP
Pn: Pratt-----	0-12 12-37 >37	Loamy fine sand Loamy fine sand Weathered bedrock	SM SC-SM, SM	A-2 A-2, A-4	0 0	0	100 100	95-100 95-100	70-100 90-100	15-35 15-40	---	NP NP-6
Po: Pratt-----	0-12 12-36 36-60	Loamy fine sand Loamy fine sand Fine sand	SM SC-SM, SM SM, SP-SM	A-2 A-2, A-4 A-2, A-3	0 0 0	0	100 100 100	95-100 95-100 95-100	70-100 90-100 80-100	15-35 15-40 5-35	---	NP NP-6 NP
Carwile-----	0-14	Fine sandy loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	0	100	98-100	90-100	36-60	15-26	NP-7
Pt: Pratt-----	14-20 20-42 42-60	Sandy clay loam Clay Sandy clay loam	CL, SC CH, CL, SC CH, CL, SC	A-6, A-7 A-6, A-7 A-4, A-6, A-7	0 0 0	0	100 100 100	100 100 100	90-100 90-100 90-100	36-90 40-95 36-95	35-50 35-70 25-70	14-26 14-38 7-38
Tivoli-----	0-5 5-60	Loamy fine sand Fine sand	SM SM, SP-SM	A-2 A-2, A-3	0 0	0	100 100	95-100 95-100	90-100 90-100	15-35 5-25	---	NP NP NP
Qa: Quinlan-----	0-9 >9	Loam Weathered bedrock	CL-ML, ML, CL	A-4, A-6	0	0	100	95-100	90-100	51-97	15-37	NP-14
Qn: Quinlan-----	0-9 >9	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	51-97	15-37	NP-14
Qu: Quinlan-----	0-9 >9	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0	0	100	95-100	90-100	51-97	15-37	NP-14
Rc: Renfrow-----	0-9 9-13 13-60	Clay loam Clay loam Clay	CL CL CH, CL	A-6, A-7 A-6, A-7 A-6, A-7	0 0 0	0	100 100 100	100 100 100	96-100 96-100 96-100	80-98 80-98 80-99	33-49 37-49 37-70	12-26 15-26 15-38
Vernon-----	0-7 7-24 24-28 28-80	Clay loam Silty clay Weathered bedrock	CL CH, CL CH, CL	A-6, A-7-6 A-6, A-7-6 A-6, A-7-6	0 0 0	0	95-100 95-100 90-100	90-100 90-100 85-100	90-100 90-100 65-100	70-95 80-98 65-96	35-50 38-60 30-60	17-30 20-40 15-38
Re: Ruella-----	0-9 9-60	Loam Loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-4, A-6	0 0	0	100 100	100 100	85-100 85-100	65-85 65-85	25-35 25-35	5-15 5-15

ENGINEERING INDEX PROPERTIES--Continued
Harper County, Kansas

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Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
					Pct	Pct						
Rh: Ruella-----	0-9 9-60	Loam Loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-4, A-6	0 0	0 0	100 100	100 100	85-100 85-100	65-85 65-85	25-35 25-35	5-15 5-15
Ru: Ruella-----	0-9 9-60	Loam Loam	CL, CL-ML CL, CL-ML	A-4, A-6 A-4, A-6	0 0	0 0	100 100	100 100	85-100 85-100	65-85 65-85	25-35 25-35	5-15 5-15
Sa: Lesho-----	0-18 18-36 36-60	Clay loam Loam Coarse sand	CL CL SM, SP-SM	A-6, A-7-6 A-6, A-7-6 A-2, A-3	0 0 0	0 0 0	100 100 100	100 100 95-100	90-100 85-100 55-75	75-95 65-95 5-35	35-45 30-45 ---	15-22 11-22 NP
Sb: Shellabarger---	0-13 13-38 38-60	Fine sandy loam Sandy clay loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Se: Shellabarger---	0-13 13-38 38-60	Fine sandy loam Fine sandy loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Sf: Shellabarger---	0-13 13-38 38-60	Fine sandy loam Sandy clay loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Sg: Shellabarger---	0-13 13-38 38-60	Fine sandy loam Sandy clay loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Sh: Zellmont-----	0-8 8-18 18-26 26-32 32-80	Sandy loam Sandy clay loam Sandy clay loam Loam Weathered bedrock	CL, SC CL, SC SC, SC-SM, SP-SC CL, SC	A-4, A-6, A-2-4, A-2-6 A-4, A-6, A-2-4, A-2-6 A-2-4 A-2-4, A-2-6	0 0 0 0	0 0 0 0	95-100 95-100 80-100 85-100	95-100 95-100 70-100 70-100	75-100 65-100 50-80 65-100	30-55 45-80 10-40 45-80	25-35 30-40 20-30 30-40	10-15 10-20 5-10 10-20
SHH: Shellabarger---	0-10 10-45 45-60	Sandy loam Sandy clay loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Sk: Zellmont-----	0-8 8-18 18-26 26-32 32-80	Sandy loam Sandy clay loam Sandy clay loam Loam Weathered bedrock	CL, SC CL, SC SC, SC-SM, SP-SC CL, SC	A-4, A-6, A-2-4, A-2-6 A-4, A-6, A-2-4, A-2-6 A-2-4 A-2-4, A-2-6	0 0 0 0	0 0 0 0	95-100 95-100 80-100 85-100	95-100 95-100 70-100 70-100	75-100 65-100 50-80 65-100	30-55 45-80 10-40 45-80	25-35 30-40 20-30 30-40	10-15 10-20 5-10 10-20
Sm: Zellmont, erode	0-8 8-18 18-26 26-32 32-80	Sandy loam Sandy clay loam Sandy clay loam Loam Weathered bedrock	CL, SC CL, SC SC, SC-SM, SP-SC CL, SC	A-4, A-6, A-2-4, A-2-6 A-4, A-6, A-2-4, A-2-6 A-2-4 A-2-4, A-2-6	0 0 0 0	0 0 0 0	95-100 95-100 80-100 85-100	95-100 95-100 70-100 70-100	75-100 65-100 50-80 65-100	30-55 45-80 10-40 45-80	25-35 30-40 20-30 30-40	10-15 10-20 5-10 10-20
Sn: Shellabarger---	0-13 13-38 38-60	Loamy fine sand Sandy clay loam Coarse sandy loam	SM SC SC, SC-SM, SM, SP-SM	A-2 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	70-100 70-90 50-80	15-35 35-50 10-40	---	NP 8-20 NP-10
So: Shellabarger---	0-13 13-38 38-60	Fine sandy loam Sandy clay loam Coarse sandy loam	ML, SM SC SC, SC-SM, SM, SP-SM	A-2, A-4 A-4, A-6 A-2, A-4	0 0 0	0 0 0	95-100 95-100 80-100	95-100 85-100 70-100	75-100 70-90 50-80	30-55 35-50 10-40	15-30 25-40 15-30	NP-5 8-20 NP-10
Albion-----	0-6 6-21 21-60	Sandy loam Sandy loam Loamy sand	ML, SM ML, SM GM, GP-GM, SM, SP-SM	A-2, A-4 A-2, A-4 A-1, A-2, A-3	0 0 0	0 0 0-5	100 85-100 40-100	75-100 75-100 40-90	60-90 45-90 30-70	25-55 30-55 5-30	15-30 20-35 15-30	NP-5 NP-10 NP-5
Sp: Drummond-----	0-8 8-30 30-60	Loam Clay loam Variable	CL, CL-ML, ML CH, CL	A-4, A-6 A-6, A-7	0 0 ---	0 0 ---	100 100 ---	100 100 ---	96-100 96-100 ---	65-97 80-98 ---	22-39 35-60 ---	3-15 15-35 ---
Ta: Tabler-----	0-10 10-33 33-60	Clay loam Silty clay Silty clay	CL CH, CL CH, CL	A-6, A-7 A-7 A-6, A-7	0 0 0	0 0 0	100 100 96-100	100 100 96-100	96-100 90-99 80-99	80-98 90-99 38-60	32-43 41-65 15-35	11-20 18-35 15-35

ENGINEERING INDEX PROPERTIES--Continued
Harper 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						
Th: Tivoli-----	0-5 5-60	Fine sand Fine sand	SM, SP-SM SM, SP-SM	A-2, A-3 A-2, A-3	0 0	0 0	100 100	95-100 95-100	80-100 80-100	5-25 5-25	--- ---	NP NP
Vr: Vernon-----	0-7 7-24 24-28	Clay loam Clay	CL CH, CL	A-6, A-7-6 A-6, A-7-6	0 0	0 0	95-100 95-100	90-100 90-100	90-100 90-100	70-95 80-98	35-50 38-60	17-30 20-40
Renfrow-----	0-7 7-60	Clay loam Clay	CL CH, CL	A-6, A-7 A-6, A-7	0 0	0 0	100 100	100 100	96-100 96-100	80-98 80-99	33-49 37-70	12-26 15-38
W: Water-----	---	---	---	---	---	---	---	---	---	---	---	---
Wa: Kingman-----	0-10 10-60	Clay loam Sandy loam	CL CL, CL-ML, SC, SC-SM	A-6, A-7-6 A-4, A-6	0 0	0 0	100 100	100 95-100	95-100 90-100	65-90 40-90	30-50 15-40	10-26 5-20
Wd: Woodward-----	0-24 >24	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	100 ---	90-100 ---	51-95 ---	15-31 ---	NP-12 ---
Quinlan-----	0-9 >9	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	95-100 ---	90-100 ---	51-97 ---	15-37 ---	NP-14 ---
We: Woodward-----	0-24 >24	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	100 ---	90-100 ---	51-95 ---	15-31 ---	NP-12 ---
Quinlan-----	0-9 >9	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	95-100 ---	90-100 ---	51-97 ---	15-37 ---	NP-14 ---
Ww: Woodward-----	0-24 >24	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	100 ---	90-100 ---	51-95 ---	15-31 ---	NP-12 ---
Quinlan-----	0-9 >9	Loam Weathered bedrock	CL, CL-ML, ML	A-4, A-6	0 ---	0 ---	100 ---	95-100 ---	90-100 ---	51-97 ---	15-37 ---	NP-14 ---
Za: Canadian-----	0-21 21-37 37-60	Fine sandy loam Fine sandy loam Loamy fine sand	CL-ML, ML, SC-SM, SM CL, ML, SC, SM CL, ML, SC, SM	A-4 A-4 A-2, A-4	0 0 0	0 0 0	100 100 100	98-100 98-100 98-100	94-100 94-100 90-100	36-65 36-85 15-85	15-26 15-31 15-31	NP-7 NP-10 NP-10
Zf: Zenda-----	0-15 15-60	Fine sandy loam Clay loam	CL, CL-ML, SC, SC-SM CL	A-4, A-6 A-6	0 0	0 0	100 100	95-100 95-100	85-100 85-100	35-55 55-80	20-35 25-40	5-15 10-25

Physical Properties

This 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 earthmoving 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.

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

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

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

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

Wind erodibility groups are made up of soils that have similar properties affecting their susceptibility to wind erosion in cultivated areas. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. The groups are 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.

PHYSICAL PROPERTIES OF THE SOILS
Harper County, Kansas: Maintenance needed

(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 In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Permeability (Ksat) in/hr	Available water capacity In/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
007AE: Albion-----	0-8	66	23	7-15	1.35-1.50	2.00-6.00	0.13-0.17	0.0-2.9	1.0-2.0	.20	.20	4	3	86
	8-16	67	19	10-18	1.45-1.60	2.00-6.00	0.12-0.18	0.0-2.9	---	.20	.24			
	16-27	82	9	4-15	1.45-1.60	2.00-6.00	0.09-0.12	0.0-2.9	---	.17	.20			
	27-60	92	2	2-10	1.50-1.65	5.95-19.98	0.03-0.10	0.0-2.9	---	.15	.32			
Shellabarger-	0-14	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	14-48	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	48-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
007AS: Clairemont---	0-8	10	68	18-27	1.30-1.45	0.60-2.00	0.10-0.15	0.0-2.9	0.0-2.0	.43	.43	5	4L	86
	8-60	32	42	18-35	1.35-1.55	0.60-2.00	0.10-0.15	0.0-2.9	---	.43	.43			
007FU: Farnum-----	0-9	34	38	27-29	1.35-1.45	0.60-2.00	0.19-0.22	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	9-60	34	36	25-35	1.40-1.50	0.60-2.00	0.15-0.19	3.0-5.9	---	.28	.28			
007KA: Kanza-----	0-7	86	7	3-12	1.50-1.70	5.95-19.98	0.08-0.13	0.0-2.9	1.0-3.0	.17	.17	5	2	134
	7-48	87	7	1-12	1.50-1.70	5.95-19.98	0.06-0.11	0.0-2.9	---	.17	.20			
095AD: Albion-----	0-8	66	23	7-15	1.35-1.50	2.00-6.00	0.13-0.17	0.0-2.9	1.0-2.0	.20	.20	4	3	86
	8-16	67	19	10-18	1.45-1.60	2.00-6.00	0.12-0.18	0.0-2.9	---	.20	.24			
	16-26	66	24	4-15	1.45-1.60	2.00-6.00	0.09-0.12	0.0-2.9	---	.15	.20			
	26-60	92	2	2-10	1.50-1.65	5.95-19.98	0.03-0.10	0.0-2.9	---	.15	.32			
095DA: Dillwyn-----	0-8	79	16	2-8	1.50-1.60	5.95-19.98	0.08-0.12	0.0-2.9	0.0-2.0	.17	.17	5	2	134
	8-60	79	16	2-8	1.50-1.60	5.95-19.98	0.06-0.10	0.0-2.9	---	.17	.17			
Plevna-----	0-11	67	20	8-18	1.40-1.50	2.00-6.00	0.14-0.16	0.0-2.9	1.0-4.0	.20	.20	5	3	86
	11-36	67	20	8-18	1.40-1.50	2.00-6.00	0.12-0.16	0.0-2.9	---	.20	.20			
	36-60	95	1	1-7	1.50-1.60	2.00-6.00	0.05-0.07	0.0-2.9	---	.20	.20			
095LA: Lincoln-----	0-10	84	6	5-15	1.35-1.50	5.95-19.98	0.06-0.11	0.0-2.9	0.5-0.5	.17	.17	5	2	134
	10-60			5-15	1.30-1.60	5.95-19.98	0.02-0.08	0.0-2.9	0.0-0.5	.17	.17			
095NB: Nashville----	0-28	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	>28			---	---	---	---	---	---	---	---			
Quinlan-----	0-13	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>13			---	---	---	---	---	---	---	---			
095SA: Shellabarger-	0-12	84	9	4-10	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	1.0-2.0	.20	.20	5	2	134
	12-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
095SC: Shellabarger-	0-10	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	10-45	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	45-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
095SD: Shellabarger-	0-10	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	10-45	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	45-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
095ZA: Zenda-----	0-13	34	37	27-32	1.45-1.55	0.60-2.00	0.17-0.22	3.0-5.9	1.0-3.0	.28	.28	5	6	48
	13-60	38	36	18-35	1.45-1.60	0.60-2.00	0.15-0.19	3.0-5.9	---	.28	.28			
191EA: Elandco-----	0-40	7	62	27-35	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.37	.37	5	7	38
	40-62	7	66	18-35	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	---	.43	.43			
191EC: Elandco-----	0-40	10	68	18-27	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	40-62	7	66	18-35	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	---	.43	.43			
191LS: Lincoln-----	0-11	84	6	5-15	1.35-1.50	5.95-19.98	0.06-0.11	0.0-2.9	0.5-0.5	.17	.17	5	2	134
	11-60			5-15	1.30-1.60	5.95-19.98	0.02-0.08	0.0-2.9	---	.17	.17			
191OP: Wellsford----	0-5	30	32	35-40	1.35-1.55	0.00-0.06	0.12-0.14	6.0-8.9	0.5-2.0	.32	.32	2	4	86
	5-17	23	29	35-60	1.45-1.65	0.00-0.06	0.10-0.12	6.0-8.9	---	.32	.32			
	17-21			---	---	---	---	---	---	---	---			
Elandco-----	0-40	10	68	18-27	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	40-62	7	66	18-35	1.30-1.50	0.60-2.00	0.15-0.22	3.0-5.9	---	.43	.43			
191PD: Pond Creek---	0-12	7	64	27-32	1.30-1.60	0.20-0.60	0.15-0.20	0.0-2.9	1.0-3.0	.32	.32	5	6	48
	12-68	7	65	20-35	1.40-1.70	0.20-0.60	0.15-0.22	3.0-5.9	---	.37	.37			
191RA: Renfrow-----	0-9	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	9-13	8	56	32-40	1.45-1.70	0.20-0.60	0.15-0.20	3.0-5.9	---	.43	.43			
	13-75	7	48	35-55	1.40-1.70	0.00-0.06	0.10-0.18	6.0-8.9	---	.43	.43			
Grainola-----	0-8	26	53	15-26	1.30-1.55	0.60-2.00	0.15-0.24	0.0-2.9	0.5-1.0	.43	.43	3	6	48
	8-28	6	47	35-60	1.35-1.65	0.06-0.20	0.10-0.20	6.0-8.9	---	.37	.37			
	28-36	23	29	35-60	1.35-1.65	0.06-0.20	0.02-0.20	6.0-8.9	---	.37	.37			
	36-42			---	---	---	---	---	---	---	---			
191TA: Tabler-----	0-10	20	49	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	7	38
	10-30	6	47	40-55	1.35-1.60	0.00-0.06	0.12-0.18	6.0-8.9	---	.37	.37			
	30-60	7	48	35-55	1.35-1.65	0.00-0.06	0.12-0.22	6.0-8.9	---	.37	.37			
191US: Ustifluvents-	---	---	---	---	---	---	---	---	---	---	---	---	---	---

PHYSICAL PROPERTIES OF THE SOILS
Harper County, Kansas: Maintenance needed

(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 In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Permeability (Ksat) in/hr	Available water capacity In/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
1439: Crisfield----	0-12 12-24 24-80	70 70 88	23 22 9	5-12 5-12 2-8	1.35-1.50 1.45-1.65 1.50-1.65	2.00-6.00 2.00-6.00 6.00-19.98	0.05-0.18 0.05-0.18 0.00-0.12	0.0-2.9 0.0-2.9 0.0-2.9	0.2-0.8 0.2-0.8 0.0-0.1	.15 .15 .05	.15 .15 .05	5	3	86
An: Kaski-----	0-26 26-40 40-60	40 35 66	38 38 15	18-27 18-35 8-30	1.35-1.45 1.40-1.50 1.45-1.55	0.60-2.00 0.60-2.00 0.60-2.00	0.18-0.22 0.13-0.19 0.13-0.19	3.0-5.9 3.0-5.9 0.0-2.9	1.0-3.0 --- ---	.28 .28 .28	.28 .28 .28	5	6	48
At: Attica-----	0-10 10-39 39-60	64 67 63	27 20 26	6-12 8-18 4-18	1.45-1.55 1.50-1.60 1.50-1.60	2.00-6.00 2.00-6.00 2.00-6.00	0.16-0.18 0.12-0.17 0.08-0.16	0.0-2.9 0.0-2.9 0.0-2.9	0.5-1.0 --- ---	.24 .24 .24	.24 .24 .28	5	3	86
Be: Bethany-----	0-13 13-17 17-60	26 20 7	53 49 51	15-26 27-35 35-50	1.30-1.50 1.45-1.70 1.40-1.70	0.60-2.00 0.20-0.60 0.06-0.20	0.16-0.24 0.16-0.20 0.14-0.18	0.0-2.9 3.0-5.9 6.0-8.9	1.0-3.0 --- ---	.43 .37 .37	.43 .37 .37	5	6	48
Bh: Bethany-----	0-13 13-17 17-60	26 20 7	53 49 51	15-26 27-35 35-50	1.30-1.50 1.45-1.70 1.40-1.70	0.60-2.00 0.20-0.60 0.06-0.20	0.16-0.24 0.16-0.20 0.14-0.18	0.0-2.9 3.0-5.9 6.0-8.9	1.0-3.0 --- ---	.43 .37 .37	.43 .37 .37	5	6	48
Bm: Lincoln-----	0-21 21-60	84	6	5-15 5-15	1.35-1.50 1.30-1.60	5.95-19.98 5.95-19.98	0.06-0.11 0.02-0.08	0.0-2.9 0.0-2.9	0.5-0.5 0.0-0.5	.17 .17	.17 .17	5	2	134
Bo: Gerlane-----	0-4 4-30 30-60	84 23	6 29	5-15 2-10 40-55	1.35-1.50 1.30-1.60 1.20-1.30	5.95-19.98 5.95-19.98 0.06-0.20	0.06-0.11 0.02-0.08 0.08-0.10	0.0-2.9 0.0-2.9 6.0-8.9	0.5-0.5 --- ---	.17 .17 .32	.17 .17 .32	5	2	134
Bp: Woodward-----	0-24 >24	14	72	10-18	1.30-1.60	0.60-2.00	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
Port-----	0-27 27-60	12 7	69 65	12-26 20-35	1.30-1.55 1.30-1.60	0.60-2.00 0.60-2.00	0.15-0.24 0.15-0.24	0.0-2.9 3.0-5.9	1.0-3.0 ---	.37 .37	.37 .37	5	6	48
Br: Broken Alluvial Land-----	0-6 6-60	27 25	54 53	10-27 10-35	1.30-1.45 1.30-1.45	0.60-2.00 0.60-2.00	0.20-0.24 0.18-0.22	0.0-2.9 3.0-5.9	0.5-2.0 ---	.37 .43	.37 .43	5	4L	86
Ca: Carwile-----	0-14 14-20 20-60	62 54 23	26 14 29	5-18 25-39 35-60	1.30-1.65 1.45-1.75 1.35-1.75	0.60-2.00 0.20-2.00 0.06-0.20	0.11-0.20 0.12-0.20 0.12-0.20	0.0-2.9 3.0-5.9 6.0-8.9	1.0-3.0 --- ---	.24 .37 .37	.24 .37 .37	5	3	86
Cc: Case-----	0-7 7-60	34 35	37 38	27-32 18-35	1.35-1.45 1.35-1.70	0.60-2.00 0.60-2.00	0.17-0.22 0.15-0.19	0.0-2.9 3.0-5.9	0.5-2.0 ---	.32 .32	.32 .32	5	4L	86
Clark-----	0-8 8-60	42 35	37 38	15-27 18-35	1.35-1.45 1.35-1.70	0.60-2.00 0.60-2.00	0.17-0.22 0.14-0.19	3.0-5.9 3.0-5.9	1.0-2.0 ---	.28 .28	.28 .28	5	4L	86
Ce: Corbin-----	0-16 16-30 30-55 55-60	11 7 33 7	67 62 31 53	14-30 27-35 27-45 35-45	1.35-1.45 1.45-1.55 1.40-1.50 1.40-1.50	0.60-2.00 0.60-2.00 0.06-0.20 0.20-2.00	0.19-0.24 0.18-0.20 0.09-0.16 0.11-0.18	0.0-2.9 3.0-5.9 6.0-8.9 3.0-5.9	1.0-3.0 --- --- ---	.32 .32 .32 .32	.32 .32 .32 .32	5	6	48
CF: Corbin-----	0-16 16-30 30-55 55-60	11 7 33 7	67 62 31 53	14-30 27-35 27-45 35-45	1.35-1.45 1.45-1.55 1.40-1.50 1.40-1.50	0.60-2.00 0.60-2.00 0.06-0.20 0.20-2.00	0.19-0.24 0.18-0.20 0.09-0.16 0.11-0.18	0.0-2.9 3.0-5.9 6.0-8.9 3.0-5.9	1.0-3.0 --- --- ---	.32 .32 .32 .32	.32 .32 .32 .32	5	6	48
Fa: Farnum-----	0-7 7-41 41-60	34 34 38	38 36 41	27-29 25-35 12-29	1.35-1.45 1.40-1.50 1.40-1.55	0.60-2.00 0.60-2.00 0.60-2.00	0.19-0.22 0.15-0.19 0.13-0.16	0.0-2.9 3.0-5.9 0.0-2.9	1.0-3.0 --- ---	.28 .28 .28	.28 .28 .28	5	6	48
Fm: Farnum-----	0-11 11-41 41-60	42 34 38	38 36 41	14-27 25-35 12-29	1.35-1.45 1.40-1.50 1.40-1.55	0.60-2.00 0.60-2.00 0.60-2.00	0.19-0.22 0.15-0.19 0.13-0.16	0.0-2.9 3.0-5.9 0.0-2.9	1.0-3.0 --- ---	.28 .28 .28	.28 .28 .28	5	6	48
Fn: Farnum-----	0-11 11-41 41-60	42 34 38	38 36 41	14-27 25-35 12-29	1.35-1.45 1.40-1.50 1.40-1.55	0.60-2.00 0.60-2.00 0.60-2.00	0.19-0.22 0.15-0.19 0.13-0.16	0.0-2.9 3.0-5.9 0.0-2.9	1.0-3.0 --- ---	.28 .28 .28	.28 .28 .28	5	6	48
Fu: Farnum-----	0-11 11-41 41-60	42 34 38	38 36 41	14-27 25-35 12-29	1.35-1.45 1.40-1.50 1.40-1.55	0.60-2.00 0.60-2.00 0.60-2.00	0.19-0.22 0.15-0.19 0.13-0.16	0.0-2.9 3.0-5.9 0.0-2.9	1.0-3.0 --- ---	.28 .28 .28	.28 .28 .28	5	6	48
Ge: Gerlane-----	0-17 17-40 40-48 48-60	66 66 84 36	20 20 2 39	10-18 10-18 10-18 20-30	1.35-1.50 1.35-1.50 1.50-1.60 1.50-1.60	2.00-6.00 2.00-6.00 2.00-6.00 0.20-2.00	0.13-0.18 0.12-0.17 0.08-0.13 0.15-0.18	0.0-2.9 0.0-2.9 0.0-2.9 0.0-2.9	1.0-3.0 --- --- ---	.20 .20 .20 .20	.20 .20 .20 .20	5	3	86
Gn: Grant-----	0-11 11-33 33-50 >50	11 7 11	68 66 68	15-26 18-35 15-26	1.30-1.50 1.40-1.70 1.40-1.65	0.57-5.95 0.60-2.00 0.60-2.00	0.15-0.20 0.15-0.20 0.16-0.22	0.0-2.9 0.0-2.9 0.0-2.9	1.0-3.0 --- ---	.37 .37 .37	.37 .37 .37	4	5	56

PHYSICAL PROPERTIES OF THE SOILS
Harper County, Kansas: Maintenance needed

(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	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Gr:														
Grant-----	0-11	11	68	15-26	1.30-1.50	0.57-5.95	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	11-33	7	66	18-35	1.40-1.70	0.60-2.00	0.15-0.20	0.0-2.9	---	.37	.37			
	33-50	11	68	15-26	1.40-1.65	0.60-2.00	0.16-0.22	0.0-2.9	---	.37	.37			
	>50			---	---	---	---	---	---	---	---			
GRP:														
Gravel Pits--	---			---	---	---	---	---	---	---	---			
Gs:														
Grant-----	0-11	11	68	15-26	1.30-1.50	0.57-5.95	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	4	5	56
	11-33	7	66	18-35	1.40-1.70	0.60-2.00	0.15-0.20	0.0-2.9	---	.37	.37			
	33-50	11	68	15-26	1.40-1.65	0.60-2.00	0.16-0.22	0.0-2.9	---	.37	.37			
	50-60			---	---	---	---	---	---	---	---			
INT:														
Aquolls-----	0-60			---	---	---	---	---	---	---	---			0
Ka:														
Kanza-----	0-8	86	7	3-12	1.50-1.70	5.95-19.98	0.08-0.13	0.0-2.9	1.0-3.0	.17	.20	5	2	134
	8-60	87	7	1-12	1.50-1.70	5.95-19.98	0.06-0.11	0.0-2.9	---	.17	.20			
Kk:														
Kaski-----	0-19	40	38	18-27	1.35-1.45	0.60-2.00	0.18-0.22	3.0-5.9	1.0-3.0	.28	.28	5	6	48
	19-40	38	36	18-35	1.40-1.50	0.60-2.00	0.13-0.19	3.0-5.9	---	.28	.28			
	40-60	66	15	8-30	1.45-1.55	0.60-2.00	0.13-0.19	0.0-2.9	---	.28	.28			
Km:														
Kirkland----	0-12	27	54	13-26	1.30-1.50	0.60-2.00	0.16-0.24	0.0-2.9	1.0-3.0	.49	.49	5	6	48
	12-34	5	45	40-60	1.35-1.60	0.00-0.06	0.10-0.14	6.0-8.9	---	.37	.37			
	34-60	23	29	35-60	1.40-1.65	0.20-0.60	0.10-0.18	6.0-8.9	---	.32	.32			
Kr:														
Kirkland----	0-12	35	34	27-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	12-34	5	45	40-60	1.35-1.60	0.00-0.06	0.10-0.14	6.0-8.9	---	.37	.37			
	34-60	23	29	35-60	1.40-1.65	0.20-0.60	0.10-0.18	6.0-8.9	---	.32	.32			
Renfrow-----	0-9	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	9-13	31	33	32-40	1.45-1.70	0.20-0.60	0.15-0.20	3.0-5.9	---	.43	.43			
	13-60	26	29	35-55	1.40-1.70	0.00-0.06	0.10-0.18	6.0-8.9	---	.43	.43			
Kw:														
Kirkland----	0-6	35	34	27-35	1.30-1.60	0.60-2.00	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	6-34	5	45	40-60	1.35-1.60	0.00-0.06	0.10-0.14	6.0-8.9	---	.37	.37			
	34-60	23	29	35-60	1.40-1.65	0.20-0.60	0.10-0.18	6.0-8.9	---	.32	.32			
Renfrow-----	0-6	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	6-60	26	29	35-55	1.40-1.70	0.00-0.06	0.10-0.18	6.0-8.9	---	.43	.43			
Mc:														
Minco-----	0-42	14	73	8-18	1.35-1.60	0.60-2.00	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	42-60	14	73	8-18	1.35-1.60	0.60-2.00	0.11-0.24	0.0-2.9	---	.37	.37			
Mn:														
Minco-----	0-42	14	73	8-18	1.35-1.60	0.60-2.00	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	42-60	14	73	8-18	1.35-1.60	0.60-2.00	0.11-0.24	0.0-2.9	---	.37	.37			
Mo:														
Minco-----	0-42	14	73	8-18	1.35-1.60	0.60-2.00	0.13-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	42-60	14	73	8-18	1.35-1.60	0.60-2.00	0.11-0.24	0.0-2.9	---	.37	.37			
Na:														
Nashville----	0-12	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	12-30	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	---	.43	.43			
	>30			---	---	---	---	---	---	---	---			
Ne:														
Nashville----	0-12	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	12-30	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	---	.43	.43			
	>30			---	---	---	---	---	---	---	---			
Nh:														
Nashville----	0-12	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	12-30	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	---	.43	.43			
	30-60			---	---	---	---	---	---	---	---			
Nn:														
Nashville----	0-7	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	2.0-4.0	.32	.32	3	6	48
	7-30	10	68	18-27	1.20-1.40	0.60-2.00	0.20-0.24	0.0-2.9	---	.43	.43			
	>30			---	---	---	---	---	---	---	---			
No:														
Norge-----	0-10	42	38	14-27	1.35-1.45	0.60-2.00	0.20-0.22	0.0-2.9	1.0-3.0	.28	.28	5	6	48
	10-60	34	36	25-35	1.40-1.55	0.20-0.60	0.14-0.21	3.0-5.9	---	.28	.28			
Pc:														
Pond Creek---	0-13	11	68	15-26	1.30-1.50	0.60-2.00	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	13-60	7	65	20-35	1.40-1.70	0.20-0.60	0.15-0.22	3.0-5.9	---	.37	.37			
Pd:														
Pond Creek---	0-13	11	68	15-26	1.30-1.50	0.60-2.00	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	13-60	7	65	20-35	1.40-1.70	0.20-0.60	0.15-0.22	3.0-5.9	---	.37	.37			
Pe:														
Pond Creek---	0-13	11	68	15-26	1.30-1.50	0.60-2.00	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	13-60	7	65	20-35	1.40-1.70	0.20-0.60	0.15-0.22	3.0-5.9	---	.37	.37			
Pg:														
Pond Creek---	0-8	11	68	15-26	1.30-1.50	0.60-2.00	0.15-0.20	0.0-2.9	1.0-3.0	.37	.37	5	6	48
	8-60	7	65	20-35	1.40-1.70	0.20-0.60	0.15-0.22	3.0-5.9	---	.37	.37			
Ph:														
Dale-----	0-22	11	68	15-26	1.30-1.50	0.60-2.00	0.15-0.24	0.0-2.9	1.0-3.0	.37	.37	5	5	56
	22-60	9	64	18-35	1.40-1.70	0.60-2.00	0.15-0.24	3.0-5.9	---	.37	.37			
Pk:														
Port-----	0-22	11	67	18-26	1.30-1.45	0.60-2.00	0.15-0.24	0.0-2.9	1.0-3.0	.32	.32	5	5	56
	22-44	9	64	18-35	1.35-1.50	0.60-2.00	0.10-0.15	3.0-5.9	---	.37	.37			
	44-60	7	66	18-35	1.35-1.50	0.60-2.00	0.10-0.15	3.0-5.9	---	.37	.37			

PHYSICAL PROPERTIES OF THE SOILS
Harper County, Kansas: Maintenance needed

(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 In	Sand Pct	Silt Pct	Clay Pct	Moist bulk density g/cc	Permeability (Ksat) in/hr	Available water capacity In/in	Linear extensibility Pct	Organic matter Pct	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
Pm: Pratt-----	0-12	79	16	2-8	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	12-36	86	7	4-11	1.45-1.55	5.95-19.98	0.09-0.12	0.0-2.9	---	.17	.17			
	36-60	95	1	1-8	1.45-1.60	5.95-19.98	0.08-0.12	0.0-2.9	---	.17	.17			
Pn: Pratt-----	0-12	79	16	2-8	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	0.5-1.0	.17	.17	3	2	134
	12-37	86	7	4-11	1.45-1.55	5.95-19.98	0.09-0.12	0.0-2.9	---	.17	.17			
	>37				---	---	---	---	---	---	---			
Po: Pratt-----	0-12	79	16	2-8	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	12-36	86	7	4-11	1.45-1.55	5.95-19.98	0.09-0.12	0.0-2.9	---	.17	.17			
	36-60	95	1	1-8	1.45-1.60	5.95-19.98	0.08-0.12	0.0-2.9	---	.17	.17			
Carwile-----	0-14	62	26	5-18	1.30-1.65	0.60-2.00	0.11-0.20	0.0-2.9	1.0-3.0	.24	.24	5	3	86
	14-20	54	14	25-39	1.45-1.75	0.20-2.00	0.12-0.20	3.0-5.9	---	.37	.37			
	20-42	23	29	35-60	1.35-1.75	0.06-0.20	0.12-0.20	6.0-8.9	---	.37	.37			
	42-60	54	14	20-45	1.35-1.75	0.20-2.00	0.12-0.20	6.0-8.9	---	.32	.32			
Pt: Pratt-----	0-12	79	16	2-8	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	0.5-1.0	.17	.17	5	2	134
	12-20	86	7	4-11	1.45-1.55	5.95-19.98	0.09-0.12	0.0-2.9	---	.17	.17			
	20-60	95	1	1-8	1.45-1.60	5.95-19.98	0.08-0.12	0.0-2.9	---	.17	.17			
Tivoli-----	0-5	86	7	5-10	1.35-1.50	5.95-19.98	0.07-0.11	0.0-2.9	0.0-1.0	.17	.17	5	2	134
	5-60	93	1	1-10	1.50-1.70	5.95-19.98	0.02-0.08	0.0-2.9	---	.17	.17			
Qa: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9				---	---	---	---	---	---	---			
Qn: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9				---	---	---	---	---	---	---			
Qu: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9				---	---	---	---	---	---	---			
Rc: Renfrow-----	0-9	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	9-13	31	33	32-40	1.45-1.70	0.20-0.60	0.15-0.20	3.0-5.9	---	.43	.43			
	13-60	26	29	35-55	1.40-1.70	0.00-0.06	0.10-0.18	6.0-8.9	---	.43	.43			
Vernon-----	0-7	30	32	35-40	1.40-1.60	0.06-0.20	0.12-0.17	6.0-8.9	0.5-2.0	.37	.37	4	4	86
	7-24	5	45	40-60	1.50-1.65	0.00-0.06	0.10-0.15	6.0-8.9	0.0-1.0	.37	.37			
	24-28	22	28	40-60	1.70-2.00	0.00-0.06	0.01-0.06	6.0-8.9	0.5-0.5	.32	.32			
	28-80				1.85-2.00	0.06-0.20	---	---	---	---	---			
Re: Ruella-----	0-9	40	38	18-27	1.35-1.45	0.60-2.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	9-60	38	36	18-35	1.35-1.70	0.60-2.00	0.18-0.22	0.0-2.9	---	.32	.32			
Rh: Ruella-----	0-9	40	38	18-27	1.35-1.45	0.60-2.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	9-60	38	36	18-35	1.35-1.70	0.60-2.00	0.18-0.22	0.0-2.9	---	.32	.32			
Ru: Ruella-----	0-9	40	38	18-27	1.35-1.45	0.60-2.00	0.18-0.22	0.0-2.9	1.0-2.0	.32	.32	5	4L	86
	9-60	38	36	18-35	1.35-1.70	0.60-2.00	0.18-0.22	0.0-2.9	---	.32	.32			
Sa: Lesho-----	0-18	35	33	28-35	1.30-1.40	0.20-0.60	0.17-0.19	3.0-5.9	1.0-2.0	.28	.28	4	4L	86
	18-36	37	35	22-35	1.35-1.45	0.20-0.60	0.15-0.19	3.0-5.9	---	.28	.28			
	36-60	91	6	1-5	1.45-1.55	5.95-19.98	0.03-0.07	0.0-2.9	---	.15	.15			
Sb: Shellabarger-	0-13	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	13-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Se: Shellabarger-	0-13	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	13-38	59	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Sf: Shellabarger-	0-13	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	13-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Sg: Shellabarger-	0-13	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	13-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Sh: Zellmont-----	0-8	66	23	11-19	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	3	3	86
	8-18	49	28	20-34	1.40-1.55	0.20-0.60	0.14-0.21	3.0-5.9	0.0-1.0	.28	.28			
	18-26	54	22	10-28	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	0.0-0.5	.28	.32			
	26-32	46	19	20-35	1.40-1.55	0.20-0.60	0.14-0.18	3.0-5.9	0.0-0.5	.28	.28			
	32-80				1.85-2.00	0.06-0.20	---	---	---	---	---			
SHH: Shellabarger-	0-10	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	10-45	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	45-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Sk: Zellmont-----	0-8	66	23	11-19	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	3	3	86
	8-18	49	28	20-34	1.40-1.55	0.20-0.60	0.14-0.21	3.0-5.9	0.0-1.0	.28	.28			
	18-26	54	22	10-28	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	0.0-0.5	.28	.32			
	26-32	46	19	20-35	1.40-1.55	0.20-0.60	0.14-0.18	3.0-5.9	0.0-0.5	.28	.28			
	32-80				1.85-2.00	0.06-0.20	---	---	---	---	---			

PHYSICAL PROPERTIES OF THE SOILS
Harper County, Kansas: Maintenance needed

(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	Permeability (Ksat)	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										K	Kf	T		
	In	Pct	Pct	Pct	g/cc	in/hr	In/in	Pct	Pct					
Sm: Zellmont, eroded-----	0-8	66	23	11-19	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	3	3	86
	8-18	49	28	20-34	1.40-1.55	0.20-0.60	0.14-0.21	3.0-5.9	0.0-1.0	.28	.28			
	18-26	54	22	10-28	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	0.0-0.5	.28	.32			
	26-32	46	19	20-35	1.40-1.55	0.20-0.60	0.14-0.18	3.0-5.9	0.0-0.5	.28	.28			
	32-80			---	1.85-2.00	0.06-0.20	---	---	---	---	---			
Sn: Shellabarger-	0-13	86	7	4-10	1.40-1.55	5.95-19.98	0.10-0.13	0.0-2.9	1.0-2.0	.20	.28	5	2	134
	13-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
So: Shellabarger-	0-13	68	20	8-16	1.35-1.50	0.60-2.00	0.13-0.21	0.0-2.9	1.0-2.0	.20	.20	5	3	86
	13-38	60	18	18-27	1.45-1.60	0.60-2.00	0.16-0.18	0.0-2.9	---	.28	.32			
	38-60	66	24	3-18	1.50-1.65	0.60-2.00	0.05-0.16	0.0-2.9	---	.28	.32			
Albion-----	0-6	66	23	7-15	1.35-1.50	2.00-6.00	0.13-0.17	0.0-2.9	1.0-2.0	.20	.20	4	3	86
	6-21	67	19	10-18	1.45-1.60	2.00-6.00	0.12-0.18	0.0-2.9	---	.20	.24			
	21-60	85	9	2-10	1.50-1.65	5.95-19.98	0.03-0.10	0.0-2.9	---	.15	.32			
Sp: Drummond-----	0-8	38	36	20-30	1.35-1.55	0.60-2.00	0.08-0.12	0.0-2.9	0.5-1.0	.49	.49	2	4L	86
	8-30	25	27	35-60	1.40-1.65	0.00-0.06	0.06-0.12	6.0-8.9	---	.37	.37			
	30-60			---	---	---	---	---	---	---	---			
Ta: Tabler-----	0-10	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	7	38
	10-33	6	47	40-55	1.35-1.60	0.00-0.06	0.12-0.18	6.0-8.9	---	.37	.37			
	33-60	7	48	35-55	1.35-1.65	0.00-0.06	0.12-0.22	6.0-8.9	---	.37	.37			
Th: Tivoli-----	0-5	93	1	1-10	1.35-1.50	5.95-19.98	0.02-0.08	0.0-2.9	0.0-1.0	.17	.17	5	1	250
	5-60	93	1	1-10	1.50-1.70	5.95-19.98	0.02-0.08	0.0-2.9	---	.17	.17			
Vr: Vernon-----	0-7	30	32	35-40	1.40-1.60	0.06-0.20	0.12-0.17	6.0-8.9	0.5-2.0	.37	.37	4	4	86
	7-24	22	28	40-60	1.50-1.65	0.00-0.06	0.10-0.15	6.0-8.9	0.0-1.0	.37	.37			
	24-28	22	28	40-60	1.70-2.00	0.00-0.06	0.01-0.06	6.0-8.9	0.5-0.5	.32	.32			
Renfrow-----	0-7	35	34	27-35	1.30-1.60	0.20-0.60	0.15-0.22	3.0-5.9	1.0-3.0	.43	.43	5	6	48
	7-60	26	29	35-55	1.40-1.70	0.00-0.06	0.10-0.18	6.0-8.9	---	.43	.43			
W: Water-----	---			---	---	---	---	---	---	---	---			
Wa: Kingman-----	0-10	27	42	27-35	1.35-1.45	0.20-0.60	0.17-0.22	3.0-5.9	2.0-4.0	.32	.32	5	4L	86
	10-60	64	15	12-30	1.45-1.60	0.20-2.00	0.12-0.19	0.0-2.9	---	.32	.32			
Wd: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9			---	---	---	---	---	---	---	---			
Woodward-----	0-24	43	43	10-18	1.30-1.60	0.60-2.00	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
	>24			---	---	---	---	---	---	---	---			
We: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9			---	---	---	---	---	---	---	---			
Woodward-----	0-24	43	43	10-18	1.30-1.60	0.60-2.00	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
	>24			---	---	---	---	---	---	---	---			
Ww: Quinlan-----	0-9	42	37	15-27	1.30-1.55	0.60-2.00	0.13-0.24	0.0-2.9	0.0-1.0	.37	.37	2	4L	86
	>9			---	---	---	---	---	---	---	---			
Woodward-----	0-24	43	43	10-18	1.30-1.60	0.60-2.00	0.13-0.20	0.0-2.9	0.5-2.0	.37	.37	3	4L	86
	>24			---	---	---	---	---	---	---	---			
Za: Canadian-----	0-21	62	26	5-18	1.30-1.60	2.00-6.00	0.10-0.15	0.0-2.9	1.0-3.0	.20	.20	5	3	86
	21-37	66	20	10-18	1.40-1.70	2.00-6.00	0.10-0.20	0.0-2.9	---	.20	.20			
	37-60	87	2	5-18	1.40-1.70	1.98-19.98	0.07-0.20	0.0-2.9	---	.20	.20			
Zf: Zenda-----	0-15	65	20	10-20	1.50-1.60	0.60-2.00	0.16-0.18	3.0-5.9	1.0-2.0	.28	.28	5	3	86
	15-60	35	38	18-35	1.45-1.60	0.60-2.00	0.15-0.19	3.0-5.9	---	.28	.28			

CHEMICAL PROPERTIES OF THE SOILS
Harper 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.

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
Harper County, Kansas

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
007AE:							
Albion-----	0-8	3.0-10	5.6-6.5	0	0	0	0
	8-16	4.0-11	6.1-7.8	0	0	0	0
	16-27	1.0-9.0	6.1-8.4	0	0	0	0
	27-60	0.0-6.0	6.1-8.4	0	0	0	0
Shellabarger----	0-14	3.0-11	5.1-6.5	---	---	---	---
	14-48	7.0-16	6.1-7.8	---	---	---	---
	48-60	1.0-11	6.1-8.4	---	---	---	---
007AS:							
Clairemont-----	0-8	7.0-18	7.9-8.4	---	---	4.0-16.0	---
	8-60	7.0-21	7.9-8.4	---	---	4.0-16.0	---
007FU:							
Farnum-----	0-9	11-19	5.6-7.3	---	---	---	---
	9-60	10-21	6.1-8.4	---	---	---	---
007KA:							
Kanza-----	0-7	1.0-9.0	5.6-6.5	---	---	---	---
	7-48	0.0-7.0	5.6-8.4	---	---	---	---
095AD:							
Albion-----	0-8	3.0-10	5.6-6.5	0	0	0	0
	8-16	4.0-11	6.1-7.8	0	0	0	0
	16-26	1.0-9.0	6.1-8.4	0	0	0	0
	26-60	0.0-6.0	6.1-8.4	0	0	0	0
095DA:							
Dillwyn-----	0-8	0.0-6.0	5.6-7.3	---	---	---	---
	8-60	0.0-5.0	5.6-7.8	---	---	---	---
Plevna-----	0-11	3.0-13	6.6-8.4	0	0	0	0
	11-36	3.0-11	6.6-8.4	0	0	0	0
	36-60	0.0-4.0	6.6-8.4	0	0	0	0
095LA:							
Lincoln-----	0-10	2.0-9.0	7.4-8.4	---	---	---	---
	10-60	2.0-9.0	7.9-8.4	1-5	---	---	---
095NB:							
Nashville-----	0-28	8.0-19	5.6-7.3	---	---	---	---
	>28	---	---	---	---	---	---
Quinlan-----	0-13	6.0-17	7.4-8.4	0-5	0	0	0
	>13	---	---	---	---	---	---
095SA:							
Shellabarger----	0-12	2.0-7.0	5.1-6.5	---	---	---	---
	12-38	7.0-16	6.1-7.8	---	---	---	---
	38-60	1.0-11	6.1-8.4	---	---	---	---
095SC:							
Shellabarger----	0-10	3.0-11	5.1-6.5	---	---	---	---
	10-45	7.0-16	6.1-7.8	---	---	---	---
	45-60	1.0-11	6.1-8.4	---	---	---	---
095SD:							
Shellabarger----	0-10	3.0-11	5.1-6.5	---	---	---	---
	10-45	7.0-16	6.1-7.8	---	---	---	---
	45-60	1.0-11	6.1-8.4	---	---	---	---
095ZA:							
Zenda-----	0-13	11-21	6.6-8.4	---	---	0.0-4.0	---
	13-60	7.0-21	7.4-8.4	---	---	0.0-4.0	---
191EA:							
Elandco-----	0-40	11-23	6.6-8.4	---	0	---	0
	40-62	7.0-21	7.4-8.4	---	0	---	0
191EC:							
Elandco-----	0-40	7.0-18	6.6-8.4	---	0	---	0
	40-62	7.0-21	7.4-8.4	---	0	---	0
191LS:							
Lincoln-----	0-11	2.0-9.0	7.4-8.4	---	---	---	---
	11-60	2.0-9.0	7.9-8.4	---	---	---	---
191OP:							
Wellsford-----	0-5	14-25	6.6-8.4	---	---	0.0-2.0	---
	5-17	14-36	7.9-8.4	---	---	0.0-2.0	---
	17-21	---	---	---	---	---	---
Elandco-----	0-40	7.0-18	6.6-8.4	---	0	---	0
	40-62	7.0-21	7.4-8.4	---	0	---	0
191PD:							
Pond Creek-----	0-12	11-21	5.1-7.3	---	---	---	---
	12-68	8.0-21	6.1-8.4	---	---	---	---

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

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
191RA:							
Renfrow-----	0-9	11-23	6.1-7.8	0	0	0	0
	9-13	12-24	6.1-7.8	0	0	0	0
	13-75	14-33	6.1-8.4	0	0	0	0
Grainola-----	0-8	6.0-16	6.6-8.4	---	0	0	0
	8-28	14-36	7.9-8.4	---	0	0	0
	28-36	14-36	7.9-8.4	---	0	0	0
	36-42	---	---	0	0	---	0
191TA:							
Tabler-----	0-10	11-23	5.6-8.4	0	0	0	0
	10-30	16-33	6.1-8.4	0	0	0	0
	30-60	14-33	7.4-8.4	0	0	0	0
191US:							
Ustifluvents----	---	---	---	---	---	---	---
1439:							
Crisfield-----	0-12	4.0-12	5.1-7.3	0	---	0	0
	12-24	4.0-11	5.6-7.3	0	---	0	0
	24-80	1.0-5.0	6.1-7.3	0	---	0	0
An:							
Kaski-----	0-26	7.0-18	5.6-7.3	---	---	---	---
	26-40	7.0-21	5.6-7.8	---	---	---	---
	40-60	3.0-18	5.6-8.4	---	---	---	---
At:							
Attica-----	0-10	2.0-8.0	5.6-7.3	---	---	---	---
	10-39	3.0-11	5.6-6.5	---	---	---	---
	39-60	1.0-11	6.1-7.8	---	---	---	---
Be:							
Bethany-----	0-13	6.0-18	5.6-7.3	0	0	0	0
	13-17	10-21	6.1-7.3	0	0	0	0
	17-60	14-30	6.6-8.4	---	0	0	0
Bh:							
Bethany-----	0-13	6.0-18	5.6-7.3	0	0	0	0
	13-17	10-21	6.1-7.3	0	0	0	0
	17-60	14-30	6.6-8.4	---	0	0	0
Bm:							
Lincoln-----	0-21	2.0-9.0	7.4-8.4	---	---	---	---
	21-60	2.0-9.0	7.9-8.4	1-5	---	---	---
Bo:							
Gerlane-----	0-4	2.0-9.0	7.4-8.4	---	---	---	---
	4-30	0.0-6.0	7.9-8.4	---	---	---	---
	30-60	16-33	7.9-8.4	---	---	0.0-4.0	---
Bp:							
Woodward-----	0-24	4.0-12	6.6-8.4	---	0	0	0
	>24	---	---	---	---	---	---
Port-----	0-27	5.0-18	5.6-7.8	---	0	0	0
	27-60	8.0-21	6.1-8.4	0	0	0	0
Br:							
Broken Alluvial Land-----	0-6	4.0-18	6.6-8.4	---	---	---	---
	6-60	4.0-21	7.4-8.4	---	---	---	---
Ca:							
Carwile-----	0-14	2.0-13	5.1-7.3	---	---	---	---
	14-20	10-24	5.1-7.3	---	---	---	---
	20-60	14-36	6.1-8.4	---	---	---	---
Cc:							
Case-----	0-7	11-21	7.4-8.4	0-5	---	---	---
	7-60	7.0-21	7.4-8.4	5-25	---	---	---
Clark-----	0-8	6.0-18	7.4-8.4	0-5	---	---	---
	8-60	7.0-21	7.4-8.4	15-45	---	---	---
Ce:							
Corbin-----	0-16	6.0-20	5.6-7.3	---	---	---	---
	16-30	10-21	6.1-7.3	---	---	---	---
	30-55	10-27	6.1-7.8	---	---	---	---
	55-60	14-27	6.1-8.4	---	---	---	---
Cf:							
Corbin-----	0-16	6.0-20	5.6-7.3	---	---	---	---
	16-30	10-21	6.1-7.3	---	---	---	---
	30-55	10-27	6.1-7.8	---	---	---	---
	55-60	14-27	6.1-8.4	---	---	---	---

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

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Fa:							
Farnum-----	0-7	11-19	5.6-7.3	---	---	---	---
	7-41	10-21	6.1-8.4	---	---	---	---
	41-60	4.0-18	6.6-8.4	---	---	---	---
Fm:							
Farnum-----	0-11	6.0-18	5.6-7.3	---	---	---	---
	11-41	10-21	6.1-8.4	---	---	---	---
	41-60	4.0-18	6.6-8.4	---	---	---	---
Fn:							
Farnum-----	0-11	6.0-18	5.6-7.3	---	---	---	---
	11-41	10-21	6.1-8.4	---	---	---	---
	41-60	4.0-18	6.6-8.4	---	---	---	---
Fu:							
Farnum-----	0-11	6.0-18	5.6-7.3	---	---	---	---
	11-41	10-21	6.1-8.4	---	---	---	---
	41-60	4.0-18	6.6-8.4	---	---	---	---
Ge:							
Gerlane-----	0-17	4.0-13	6.6-8.4	---	---	---	---
	17-40	4.0-11	6.6-8.4	---	---	---	---
	40-48	4.0-11	7.4-8.4	---	---	---	---
	48-60	8.0-18	7.4-8.4	---	---	---	---
Gn:							
Grant-----	0-11	6.0-18	6.1-7.8	0	0	0	0
	11-33	7.0-21	6.1-8.4	---	0	0	0
	33-50	6.0-16	7.4-8.4	---	0	0	0
	>50	---	---	---	---	---	---
Gr:							
Grant-----	0-11	6.0-18	6.1-7.8	0	0	0	0
	11-33	7.0-21	6.1-8.4	---	0	0	0
	33-50	6.0-16	7.4-8.4	---	0	0	0
	>50	---	---	---	---	---	---
GRP:							
Gravel Pits----	---	---	---	---	---	---	---
Gs:							
Grant-----	0-11	6.0-18	6.1-7.8	0	0	0	0
	11-33	7.0-21	6.1-8.4	---	0	0	0
	33-50	6.0-16	7.4-8.4	---	0	0	0
	50-60	---	---	---	---	---	---
INT:							
Aquolls-----	0-60	---	---	---	---	---	---
Ka:							
Kanza-----	0-8	1.0-9.0	5.6-6.5	---	---	---	---
	8-60	0.0-7.0	5.6-8.4	---	---	---	---
Kk:							
Kaski-----	0-19	7.0-18	5.6-7.3	---	---	---	---
	19-40	7.0-21	5.6-7.8	---	---	---	---
	40-60	3.0-18	5.6-8.4	---	---	---	---
Km:							
Kirkland-----	0-12	5.0-18	5.6-7.3	0	0	0	0
	12-34	16-36	6.6-8.4	---	0	0	0
	34-60	14-36	7.4-8.4	---	0	0	0
Kr:							
Kirkland-----	0-12	11-23	5.6-7.3	0	0	0	0
	12-34	16-36	6.6-8.4	---	0	0	0
	34-60	14-36	7.4-8.4	---	0	0	0
Renfrow-----	0-9	11-23	6.1-7.8	0	0	0	0
	9-13	12-24	6.1-7.8	0	0	0	0
	13-60	14-33	6.1-8.4	0	0	0	0
Kw:							
Kirkland-----	0-6	11-23	5.6-7.3	0	0	0	0
	6-34	16-36	6.6-8.4	---	0	0	0
	34-60	14-36	7.4-8.4	---	0	0	0
Renfrow-----	0-6	11-23	6.1-7.8	0	0	0	0
	6-60	14-33	6.1-8.4	0	0	0	0
Mc:							
Minco-----	0-42	3.0-13	5.6-8.4	0	0	0	0
	42-60	3.0-11	6.1-8.4	0	0	0	0
Mn:							
Minco-----	0-42	3.0-13	5.6-8.4	0	0	0	0
	42-60	3.0-11	6.1-8.4	0	0	0	0

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

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Mo:							
Minco-----	0-42	3.0-13	5.6-8.4	0	0	0	0
	42-60	3.0-11	6.1-8.4	0	0	0	0
Na:							
Nashville-----	0-12	8.0-19	5.6-7.3	---	---	---	---
	12-30	7.0-16	5.6-7.3	---	---	---	---
	>30	---	---	---	---	---	---
Ne:							
Nashville-----	0-12	8.0-19	5.6-7.3	---	---	---	---
	12-30	7.0-16	5.6-7.3	---	---	---	---
	>30	---	---	---	---	---	---
Nh:							
Nashville-----	0-12	8.0-19	5.6-7.3	---	---	---	---
	12-30	7.0-16	5.6-7.3	---	---	---	---
	30-60	---	---	---	---	---	---
Nn:							
Nashville-----	0-7	8.0-19	5.6-7.3	---	---	---	---
	7-30	7.0-16	5.6-7.3	---	---	---	---
	>30	---	---	---	---	---	---
No:							
Norge-----	0-10	6.0-18	5.6-6.5	---	---	---	---
	10-60	10-21	5.6-7.3	---	---	---	---
Pc:							
Pond Creek-----	0-13	6.0-18	5.1-7.3	---	---	---	---
	13-60	8.0-21	6.1-8.4	---	---	---	---
Pd:							
Pond Creek-----	0-13	6.0-18	5.1-7.3	---	---	---	---
	13-60	8.0-21	6.1-8.4	---	---	---	---
Pe:							
Pond Creek-----	0-13	6.0-18	5.1-7.3	---	---	---	---
	13-60	8.0-21	6.1-8.4	---	---	---	---
Pg:							
Pond Creek-----	0-8	6.0-18	5.1-7.3	---	---	---	---
	8-60	8.0-21	6.1-8.4	---	---	---	---
Ph:							
Dale-----	0-22	6.0-18	6.1-7.8	0	0	0	0
	22-60	7.0-21	7.4-8.4	0-5	0	0	0
Pk:							
Port-----	0-22	7.0-18	7.4-8.4	0	---	2.0-8.0	---
	22-44	7.0-21	7.4-8.4	0-5	---	4.0-16.0	---
	44-60	7.0-21	7.4-8.4	5-10	---	2.0-8.0	---
Pm:							
Pratt-----	0-12	1.0-5.0	5.6-7.3	---	---	---	---
	12-36	1.0-7.0	5.6-7.3	---	---	---	---
	36-60	0.0-5.0	6.1-7.3	---	---	---	---
Pn:							
Pratt-----	0-12	1.0-5.0	5.6-7.3	---	---	---	---
	12-37	1.0-7.0	5.6-7.3	---	---	---	---
	>37	---	---	---	---	---	---
Po:							
Pratt-----	0-12	1.0-5.0	5.6-7.3	---	---	---	---
	12-36	1.0-7.0	5.6-7.3	---	---	---	---
	36-60	0.0-5.0	6.1-7.3	---	---	---	---
Carwile-----	0-14	2.0-13	5.1-7.3	---	---	---	---
	14-20	10-24	5.1-7.3	---	---	---	---
	20-42	14-36	6.1-8.4	---	---	---	---
	42-60	8.0-27	6.6-8.4	---	---	---	---
Pt:							
Pratt-----	0-12	1.0-5.0	5.6-7.3	---	---	---	---
	12-20	1.0-7.0	5.6-7.3	---	---	---	---
	20-60	0.0-5.0	6.1-7.3	---	---	---	---
Tivoli-----	0-5	2.0-7.0	6.1-7.8	---	---	---	---
	5-60	0.0-6.0	6.1-8.4	---	---	---	---
Qa:							
Quinlan-----	0-9	6.0-17	7.4-8.4	0-5	0	0	0
	>9	---	---	---	---	---	---
Qn:							
Quinlan-----	0-9	6.0-17	7.4-8.4	0-5	0	0	0
	>9	---	---	---	---	---	---

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

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
Qu: Quinlan-----	0-9 >9	6.0-17 ---	7.4-8.4 ---	0-5 ---	0 ---	0 ---	0 ---
Rc: Renfrow-----	0-9 9-13 13-60	11-23 12-24 14-33	6.1-7.8 6.1-7.8 6.1-8.4	0 0 0	0 0 0	0 0 0	0 0 0
Vernon-----	0-7 7-24 24-28 28-80	14-25 16-37 16-36 10-20	7.9-8.4 7.9-8.4 7.9-8.4 7.4-9.0	0-5 0-5 1-20 15-25	0 0-10 0-25 0	--- --- 0.0-8.0 0	0-2 2-20 5-26 0
Re: Ruella-----	0-9 9-60	7.0-18 7.0-21	7.4-8.4 7.4-8.4	--- ---	--- ---	--- ---	--- ---
Rh: Ruella-----	0-9 9-60	7.0-18 7.0-21	7.4-8.4 7.4-8.4	--- ---	--- ---	--- ---	--- ---
Ru: Ruella-----	0-9 9-60	7.0-18 7.0-21	7.4-8.4 7.4-8.4	--- ---	--- ---	--- ---	--- ---
Sa: Lesho-----	0-18 18-36 36-60	11-22 8.0-21 0.0-3.0	7.4-9.0 7.9-9.0 7.4-9.0	--- --- ---	--- --- ---	2.0-8.0 4.0-16.0 2.0-8.0	--- --- ---
Sb: Shellabarger---	0-13 13-38 38-60	3.0-11 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---
Se: Shellabarger---	0-13 13-38 38-60	3.0-11 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---
Sf: Shellabarger---	0-13 13-38 38-60	3.0-11 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---
Sg: Shellabarger---	0-13 13-38 38-60	3.0-11 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---
Sh: Zellmont-----	0-8 8-18 18-26 26-32 32-80	6.0-10 13-18 7.0-11 13-18 ---	5.6-7.3 6.1-7.8 6.1-7.8 6.6-8.4 ---	0 0 0-2 0-2 10-20	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
SHH: Shellabarger---	0-10 10-45 45-60	3.0-11 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---
Sk: Zellmont-----	0-8 8-18 18-26 26-32 32-80	6.0-10 13-18 7.0-11 13-18 ---	5.6-7.3 6.1-7.8 6.1-7.8 6.6-8.4 ---	0 0 0-2 0-2 10-20	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Sm: Zellmont, eroded	0-8 8-18 18-26 26-32 32-80	6.0-10 13-18 7.0-11 13-18 ---	5.6-7.3 6.1-7.8 6.1-7.8 6.6-8.4 ---	0 0 0-2 0-2 10-20	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Sn: Shellabarger---	0-13 13-38 38-60	2.0-7.0 7.0-16 1.0-11	5.1-6.5 6.1-7.8 6.1-8.4	--- --- ---	--- --- ---	--- --- ---	--- --- ---

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

Map symbol and soil name	Depth	Cation- exchange capacity	Soil reaction	Calcium carbonate	Gypsum	Salinity	Sodium adsorption ratio
	In	meq/100g	pH	Pct	Pct	mmhos/cm	
So:							
Shellabarger----	0-13	3.0-11	5.1-6.5	---	---	---	---
	13-38	7.0-16	6.1-7.8	---	---	---	---
	38-60	1.0-11	6.1-8.4	---	---	---	---
Albion-----	0-6	3.0-10	5.6-6.5	0	0	0	0
	6-21	4.0-11	6.1-7.8	0	0	0	0
	21-60	0.0-6.0	6.1-8.4	0	0	0	0
Sp:							
Drummond-----	0-8	8.0-19	7.4-8.4	---	---	4.0-16.0	---
	8-30	14-36	7.9-9.0	---	---	4.0-16.0	---
	30-60	---	---	---	---	---	---
Ta:							
Tabler-----	0-10	11-23	5.6-8.4	0	0	0	0
	10-33	16-33	6.1-8.4	0	0	0	0
	33-60	14-33	7.4-8.4	0	0	0	0
Th:							
Tivoli-----	0-5	0.0-7.0	6.1-7.8	---	---	---	---
	5-60	0.0-6.0	6.1-8.4	---	---	---	---
Vr:							
Vernon-----	0-7	14-25	7.9-8.4	0-5	0	---	0-2
	7-24	16-37	7.9-8.4	0-5	0-10	---	2-20
	24-28	16-36	7.9-8.4	1-20	0-25	0.0-8.0	5-26
Renfrow-----	0-7	11-23	6.1-7.8	0	0	0	0
	7-60	14-33	6.1-8.4	0	0	0	0
W:							
Water-----	---	---	---	---	---	---	---
Wa:							
Kingman-----	0-10	11-24	7.4-8.4	0	0	0.0-4.0	0
	10-60	4.0-18	7.4-8.4	0	0	0.0-4.0	0
Wd:							
Woodward-----	0-24	4.0-12	6.6-8.4	0-5	0	0	0
	>24	---	---	---	---	---	---
Quinlan-----	0-9	6.0-17	7.4-8.4	0-5	0	0	0
	>9	---	---	---	---	---	---
We:							
Woodward-----	0-24	4.0-12	6.6-8.4	0-5	0	0	0
	>24	---	---	---	---	---	---
Quinlan-----	0-9	6.0-17	7.4-8.4	0-5	0	0	0
	>9	---	---	---	---	---	---
Ww:							
Woodward-----	0-24	4.0-12	6.6-8.4	0-5	0	0	0
	>24	---	---	---	---	---	---
Quinlan-----	0-9	6.0-17	7.4-8.4	0-5	0	0	0
	>9	---	---	---	---	---	---
Za:							
Canadian-----	0-21	2.0-13	5.6-7.3	0	0	0	0
	21-37	4.0-11	6.1-8.4	0	0	0	0
	37-60	2.0-11	6.1-8.4	0	0	0	0
Zf:							
Zenda-----	0-15	4.0-13	6.6-8.4	---	---	0.0-4.0	---
	15-60	7.0-21	7.4-8.4	---	---	0.0-4.0	---

WATER FEATURES
Harper 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				
007AE: Albion-----	B		---	---	---	---	---	---	---
Shellabarger-----	B		---	---	---	---	---	---	---
007AS: Clairemont-----	B	April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	Very brief	Frequent
007FU: Farnum-----	B		---	---	---	---	---	---	---
007KA: Kanza-----	D	January	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		February	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		March	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	Very brief	Frequent
		December	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
095AD: Albion-----	B		---	---	---	---	---	---	---
095DA: Dillwyn-----	A	January	1.0-3.0	>6.0	---	---	---	---	None
		February	1.0-3.0	>6.0	---	---	---	---	None
		March	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		April	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		May	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		June	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		July	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		August	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		September	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		October	1.0-3.0	>6.0	---	---	---	Brief	Occasional
		November	1.0-3.0	>6.0	---	---	---	---	None
		December	1.0-3.0	>6.0	---	---	---	---	None
Plevna-----	D	January	0.0-2.0	>6.0	---	---	---	---	None
		February	0.0-2.0	>6.0	---	---	---	---	None
		March	0.0-2.0	>6.0	---	---	---	Long	Frequent
		April	0.0-2.0	>6.0	---	---	---	Long	Frequent
		May	0.0-2.0	>6.0	---	---	---	Long	Frequent
		June	0.0-2.0	>6.0	---	---	---	Long	Frequent
		July	0.0-2.0	>6.0	---	---	---	Long	Frequent
		August	0.0-2.0	>6.0	---	---	---	Long	Frequent
		September	0.0-2.0	>6.0	---	---	---	Long	Frequent
		October	0.0-2.0	>6.0	---	---	---	Long	Frequent
		November	0.0-2.0	>6.0	---	---	---	---	None
		December	0.0-2.0	>6.0	---	---	---	---	None
095LA: Lincoln-----	A	January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Very brief	Occasional
		May	5.0-6.0	>6.0	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
095NB: Nashville-----	B		---	---	---	---	---	---	---
Quinlan-----	C		---	---	---	---	---	---	---
095SA: Shellabarger-----	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
095SC: Shellabarger-----	B		Ft	Ft	Ft				
			---	---	---	---	---	---	---
095SD: Shellabarger-----	B								
			---	---	---	---	---	---	---
095ZA: Zenda-----	C								
		January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	---	None
		April	2.0-4.0	>6.0	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	2.0-4.0	>6.0	---	---	---	---	None
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
191EA: Elandco-----	B								
		January	---	---	---	---	---	Brief	Occasional
		February	---	---	---	---	---	Brief	Occasional
		March	---	---	---	---	---	Brief	Occasional
		April	---	---	---	---	---	Brief	Occasional
		May	---	---	---	---	---	Brief	Occasional
		June	---	---	---	---	---	---	Rare
		October	---	---	---	---	---	Brief	Occasional
		November	---	---	---	---	---	Brief	Occasional
		December	---	---	---	---	---	Brief	Occasional
191EC: Elandco-----	B								
		January	---	---	---	---	---	Brief	Frequent
		February	---	---	---	---	---	Brief	Frequent
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	Brief	Frequent
191LS: Lincoln-----	A								
		January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		May	5.0-6.0	>6.0	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
		September	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
191OP: Wellsford-----	D								
			---	---	---	---	---	---	---
Elandco-----	B								
		January	---	---	---	---	---	Brief	Frequent
		February	---	---	---	---	---	Brief	Frequent
		March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		October	---	---	---	---	---	Brief	Frequent
		November	---	---	---	---	---	Brief	Frequent
		December	---	---	---	---	---	Brief	Frequent
191PD: Pond Creek-----	B								
			---	---	---	---	---	---	---
191RA: Renfrow-----	D								
			---	---	---	---	---	---	---
Grainola-----	D								
			---	---	---	---	---	---	---
191TA: Tabler-----	D								
		January	2.5-3.5	>6.0	---	---	---	---	None
		February	2.5-3.5	>6.0	---	---	---	---	None
		March	2.5-3.5	>6.0	---	---	---	---	None
		April	2.5-3.5	>6.0	---	---	---	---	None
		October	2.5-3.5	>6.0	---	---	---	---	None
		November	2.5-3.5	>6.0	---	---	---	---	None
		December	2.5-3.5	>6.0	---	---	---	---	None

(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				
191US: Ustifluvents-----	---		---	---	---	---	---	---	---
1439: Crisfield-----	B	March	3.3-6.1	>6.0	---	---	---	---	Rare
		April	3.3-6.1	>6.0	---	---	---	---	Rare
		May	3.3-6.1	>6.0	---	---	---	---	Rare
		June	3.3-6.1	>6.0	---	---	---	---	Rare
		July	3.3-6.1	>6.0	---	---	---	---	None
An: Kaski-----	B	March	---	---	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
At: Attica-----	B		---	---	---	---	---	---	---
Be: Bethany-----	C		---	---	---	---	---	---	---
Bh: Bethany-----	C		---	---	---	---	---	---	---
Bm: Lincoln-----	A	January	5.0-6.0	>6.0	---	---	---	---	None
		February	5.0-6.0	>6.0	---	---	---	---	None
		March	5.0-6.0	>6.0	---	---	---	---	None
		April	5.0-6.0	>6.0	---	---	---	Brief	Occasional
		May	5.0-6.0	>6.0	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	5.0-6.0	>6.0	---	---	---	---	None
		December	5.0-6.0	>6.0	---	---	---	---	None
Bo: Gerlane-----	A	January	4.0-6.0	>6.0	---	---	---	---	None
		February	4.0-6.0	>6.0	---	---	---	---	None
		March	4.0-6.0	>6.0	---	---	---	---	None
		April	4.0-6.0	>6.0	---	---	---	Brief	Occasional
		May	4.0-6.0	>6.0	---	---	---	Brief	Occasional
		June	---	---	---	---	---	Brief	Occasional
		July	---	---	---	---	---	Brief	Occasional
		August	---	---	---	---	---	Brief	Occasional
		September	---	---	---	---	---	Brief	Occasional
		October	---	---	---	---	---	Brief	Occasional
		November	4.0-6.0	>6.0	---	---	---	---	None
		December	4.0-6.0	>6.0	---	---	---	---	None
Bp: Woodward-----	B		---	---	---	---	---	---	---
Port-----	B	March	---	---	---	---	---	Brief	Frequent
		April	---	---	---	---	---	Brief	Frequent
		May	---	---	---	---	---	Brief	Frequent
		June	---	---	---	---	---	Brief	Frequent
		July	---	---	---	---	---	Brief	Frequent
		August	---	---	---	---	---	Brief	Frequent
Br: Broken Alluvial Land-----	B	April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
Ca:									

(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
Carwile-----	D	January	0.0	>6.0	0.0-1.0	Brief	---	---	None
		February	0.0	>6.0	0.0-1.0	Brief	---	---	None
		March	0.0	>6.0	0.0-1.0	Brief	---	---	None
		April	0.0	>6.0	0.0-1.0	Brief	---	---	None
		May	---	---	0.0-	---	---	---	None
		June	---	---	0.0-	---	---	---	None
		July	---	---	0.0-	---	---	---	None
		August	---	---	0.0-	---	---	---	None
		September	---	---	0.0-	---	---	---	None
		October	0.0	>6.0	0.0-1.0	Brief	---	---	None
		November	0.0	>6.0	0.0-1.0	Brief	---	---	None
		December	0.0	>6.0	0.0-1.0	Brief	---	---	None
Cc: Case-----	B		---	---	---	---	---	---	
Clark-----	B		---	---	---	---	---	---	
Ce: Corbin-----	B		---	---	---	---	---	---	
Cf: Corbin-----	B		---	---	---	---	---	---	
Fa: Farnum-----	B		---	---	---	---	---	---	
Fm: Farnum-----	B		---	---	---	---	---	---	
Fn: Farnum-----	B		---	---	---	---	---	---	
Fu: Farnum-----	B		---	---	---	---	---	---	
Ge: Gerlane-----	B	January	2.0-6.0	>6.0	---	---	---	None	
February		2.0-6.0	>6.0	---	---	---	---	None	
March		2.0-6.0	>6.0	---	---	---	Very brief	Occasional	
April		---	---	---	---	---	Very brief	Occasional	
May		---	---	---	---	---	Very brief	Occasional	
June		---	---	---	---	---	Very brief	Occasional	
July		---	---	---	---	---	Very brief	Occasional	
August		---	---	---	---	---	Very brief	Occasional	
September		---	---	---	---	---	Very brief	Occasional	
December		2.0-6.0	>6.0	---	---	---	---	None	
Gn: Grant-----		B		---	---	---	---	---	---
Gr: Grant-----		B		---	---	---	---	---	---
GRP: Gravel Pits-----	---		---	---	---	---	---	---	
Gs: Grant-----	B		---	---	---	---	---	---	
INT: Aquolls-----	C	February		---	---	---	None	None	
March			---	---	---	None	None		
April			---	---	0.0-0.8	Brief	Occasional	None	
May			0.0 0.5-1.5	3.0-5.0 >6.0	0.0-0.8	Brief	Occasional	None	
June			0.0 0.5-1.5	3.0-5.0 >6.0	0.0-0.8	Brief	Occasional	None	
November			3.0-5.0	0.5-1.5	---	---	None	None	
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
Kanza-----	D	January	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		February	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		March	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
		April	---	---	---	---	---	Very brief	Frequent
		May	---	---	---	---	---	Very brief	Frequent
		June	---	---	---	---	---	Very brief	Frequent
		July	---	---	---	---	---	Very brief	Frequent
		August	---	---	---	---	---	Very brief	Frequent
		September	---	---	---	---	---	Very brief	Frequent
		October	---	---	---	---	---	Very brief	Frequent
		November	---	---	---	---	---	Very brief	Frequent
		December	0.0-3.0	>6.0	---	---	---	Very brief	Frequent
Kk:									
Kaski-----	B	March	---	---	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
Km:									
Kirkland-----	D								
Kr:									
Kirkland-----	D								
Renfrow-----	D								
Kw:									
Kirkland-----	D								
Renfrow-----	D								
Mc:									
Minco-----	B								
Mn:									
Minco-----	B								
Mo:									
Minco-----	B								
Na:									
Nashville-----	B								
Ne:									
Nashville-----	B								
Nh:									
Nashville-----	B								
Nn:									
Nashville-----	B								
No:									
Norge-----	B								
Pc:									
Pond Creek-----	B								
Pd:									
Pond Creek-----	B								
Pe:									
Pond Creek-----	B								
Pg:									
Pond Creek-----	B								
Ph:									
Dale-----	B	March	---	---	---	---	---	Rare	
		April	---	---	---	---	---	Rare	
		May	---	---	---	---	---	Rare	
		June	---	---	---	---	---	Rare	
Pk:									

(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
Port-----	B	January	4.5-6.0	>6.0	---	---	---	---	None
		February	4.5-6.0	>6.0	---	---	---	---	None
		March	4.5-6.0	>6.0	---	---	---	---	Rare
		April	4.5-6.0	>6.0	---	---	---	---	Rare
		May	4.5-6.0	>6.0	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
		November	4.5-6.0	>6.0	---	---	---	---	None
		December	4.5-6.0	>6.0	---	---	---	---	None
Pm: Pratt-----	A		---	---	---	---	---	---	
Pn: Pratt-----	A		---	---	---	---	---	---	
Po: Pratt-----	A		---	---	---	---	---	---	
Carwile-----	D	January	1.0-2.0	>6.0	---	---	---	---	None
		February	1.0-2.0	>6.0	---	---	---	---	None
		March	1.0-2.0	>6.0	---	---	---	---	None
		April	1.0-2.0	>6.0	---	---	---	---	None
		October	1.0-2.0	>6.0	---	---	---	---	None
		November	1.0-2.0	>6.0	---	---	---	---	None
		December	1.0-2.0	>6.0	---	---	---	---	None
		January	0.0	>6.0	0.0-1.0	Brief	---	---	None
February	0.0	>6.0	0.0-1.0	Brief	---	---	None		
March	0.0	>6.0	0.0-1.0	Brief	---	---	None		
April	0.0	>6.0	0.0-1.0	Brief	---	---	None		
May	---	---	0.0-	---	---	---	None		
June	---	---	0.0-	---	---	---	None		
July	---	---	0.0-	---	---	---	None		
August	---	---	0.0-	---	---	---	None		
September	---	---	0.0-	---	---	---	None		
October	0.0	>6.0	0.0-1.0	Brief	---	---	None		
November	0.0	>6.0	0.0-1.0	Brief	---	---	None		
December	0.0	>6.0	0.0-1.0	Brief	---	---	None		
Pt: Pratt-----	A		---	---	---	---	---	---	
Tivoli-----	A		---	---	---	---	---	---	
Qa: Quinlan-----	C		---	---	---	---	---	---	
Qn: Quinlan-----	C		---	---	---	---	---	---	
Qu: Quinlan-----	C		---	---	---	---	---	---	
Rc: Renfrow-----	D		---	---	---	---	---	---	
Vernon-----	D		---	---	---	---	---	---	
Re: Ruella-----	B		---	---	---	---	---	---	
Rh: Ruella-----	B		---	---	---	---	---	---	
Ru: Ruella-----	B		---	---	---	---	---	---	
Sa: Lesho-----	C		---	---	---	---	---	---	
		March	2.0-4.0	>6.0	---	---	---	None	
		April	2.0-4.0	>6.0	---	---	Very brief	Occasional	
		May	2.0-4.0	>6.0	---	---	Very brief	Occasional	
		June	2.0-4.0	>6.0	---	---	Very brief	Occasional	
		July	---	---	---	---	Very brief	Occasional	
		August	---	---	---	---	Very brief	Occasional	
		September	---	---	---	---	Very brief	Occasional	
Sb: Shellabarger-----	B		---	---	---	---	---	---	
Se: Shellabarger-----	B		---	---	---	---	---	---	
Sf: Shellabarger-----	B		---	---	---	---	---	---	
Sg:			---	---	---	---	---	---	

(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
Shellabarger-----	B		Ft	Ft	Ft				
Sh: Zellmont-----	B		---	---	---	---	---	---	---
SHH: Shellabarger-----	B		---	---	---	---	---	---	---
Sk: Zellmont-----	B		---	---	---	---	---	---	---
Sm: Zellmont, eroded-----	B		---	---	---	---	---	---	---
Sn: Shellabarger-----	B		---	---	---	---	---	---	---
So: Shellabarger-----	B		---	---	---	---	---	---	---
Albion-----	B		---	---	---	---	---	---	---
Sp: Drummond-----	D	January	2.0-4.0	>6.0	---	---	---	---	None
		February	2.0-4.0	>6.0	---	---	---	---	None
		March	2.0-4.0	>6.0	---	---	---	---	None
		April	2.0-4.0	>6.0	---	---	---	---	None
		November	2.0-4.0	>6.0	---	---	---	---	None
		December	2.0-4.0	>6.0	---	---	---	---	None
Ta: Tabler-----	D	January	2.5-3.5	>6.0	---	---	---	---	None
		February	2.5-3.5	>6.0	---	---	---	---	None
		March	2.5-3.5	>6.0	---	---	---	---	None
		April	2.5-3.5	>6.0	---	---	---	---	None
		October	2.5-3.5	>6.0	---	---	---	---	None
		November	2.5-3.5	>6.0	---	---	---	---	None
		December	2.5-3.5	>6.0	---	---	---	---	None
Th: Tivoli-----	A		---	---	---	---	---	---	---
Vr: Vernon-----	D		---	---	---	---	---	---	---
Renfrow-----	D		---	---	---	---	---	---	---
W: Water-----	---		---	---	---	---	---	---	---
Wa: Kingman-----	D	January	0.0-2.0	>6.0	---	---	---	Very brief	Occasional
		February	0.0-2.0	>6.0	---	---	---	Very brief	Occasional
		March	0.0-2.0	>6.0	---	---	---	Very brief	Occasional
		April	---	---	---	---	---	Very brief	Occasional
		May	---	---	---	---	---	Very brief	Occasional
		June	---	---	---	---	---	Very brief	Occasional
		July	---	---	---	---	---	Very brief	Occasional
		August	---	---	---	---	---	Very brief	Occasional
		September	---	---	---	---	---	Very brief	Occasional
		October	---	---	---	---	---	Very brief	Occasional
		November	---	---	---	---	---	Very brief	Occasional
		December	0.0-2.0	>6.0	---	---	---	Very brief	Occasional
Wd: Quinlan-----	C		---	---	---	---	---	---	---
Woodward-----	B		---	---	---	---	---	---	---
We: Quinlan-----	C		---	---	---	---	---	---	---
Woodward-----	B		---	---	---	---	---	---	---
Ww: Quinlan-----	C		---	---	---	---	---	---	---
Woodward-----	B		---	---	---	---	---	---	---
Za:			---	---	---	---	---	---	---

(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
Canadian-----	B	March	---	---	---	---	---	---	Rare
		April	---	---	---	---	---	---	Rare
		May	---	---	---	---	---	---	Rare
		June	---	---	---	---	---	---	Rare
			---	---	---	---	---	---	---
Zf: Zenda-----	C	January	2.0-4.0	>6.0	---	---	---	---	None
February		2.0-4.0	>6.0	---	---	---	---	---	None
March		2.0-4.0	>6.0	---	---	---	---	---	None
April		2.0-4.0	>6.0	---	---	---	Very brief	Occasional	
May		---	---	---	---	---	Very brief	Occasional	
June		---	---	---	---	---	Very brief	Occasional	
July		---	---	---	---	---	Very brief	Occasional	
August		---	---	---	---	---	Very brief	Occasional	
September		---	---	---	---	---	Very brief	Occasional	
October		2.0-4.0	>6.0	---	---	---	---	---	None
November		2.0-4.0	>6.0	---	---	---	---	---	None
December		2.0-4.0	>6.0	---	---	---	---	---	None

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.

SOIL FEATURES--Continued
Harper County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top In	Thickness In	Hardness		Uncoated Steel	Concrete
007AE:							
Albion-----	---	---	---	---	None	Low	Low
Shellabarger----	---	---	---	---	None	Low	Moderate
007AS:							
Clairemont-----	---	---	---	---	None	High	Low
007FU:							
Farnum-----	---	---	---	---	None	Moderate	Low
007KA:							
Kanza-----	---	---	---	---	None	High	Moderate
095AD:							
Albion-----	---	---	---	---	Low	Low	Low
095DA:							
Dillwyn-----	---	---	---	---	Low	Low	Low
Plevna-----	---	---	---	---	Low	High	Low
095LA:							
Lincoln-----	---	---	---	---	Low	Low	Low
095NB:							
Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Low	Low
Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	Low	Moderate	Low
095SA:							
Shellabarger----	---	---	---	---	Low	Low	Moderate
095SC:							
Shellabarger----	---	---	---	---	None	Low	Moderate
095SD:							
Shellabarger----	---	---	---	---	None	Low	Moderate
095ZA:							
Zenda-----	---	---	---	---	Low	High	Low
191EA:							
Elandco-----	---	---	---	---	None	Moderate	Low
191EC:							
Elandco-----	---	---	---	---	None	Moderate	Low
191LS:							
Lincoln-----	---	---	---	---	None	Low	Low
191OP:							
Wellsford-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Elandco-----	---	---	---	---	None	Moderate	Low
191PD:							
Pond Creek-----	---	---	---	---	None	Moderate	Moderate
191RA:							
Renfrow-----	---	---	---	---	None	High	Low
Grainola-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
191TA:							
Tabler-----	---	---	---	---	None	High	Low
191US:							
Ustifluents----	---	---	---	---	None	---	---
1439:							
Crisfield-----	---	---	---	---	None	Low	Low
An:							
Kaski-----	---	---	---	---	None	Low	Low
At:							
Attica-----	---	---	---	---	None	Low	Low
Be:							
Bethany-----	---	---	---	---	None	High	Low
Bh:							
Bethany-----	---	---	---	---	None	High	Low
Bm:							
Lincoln-----	---	---	---	---	None	Low	Low
Bo:							
Gerlane-----	---	---	---	---	None	Low	Low
Bp:							
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Port-----	---	---	---	---	None	Moderate	Low
Br:							
Broken Alluvial Land-----	---	---	---	---	None	Low	Low
Ca:							
Carwile-----	---	---	---	---	None	High	Moderate
Cc:							
Case-----	---	---	---	---	None	Moderate	Low
Clark-----	---	---	---	---	None	Moderate	Low
Ce:							
Corbin-----	---	---	---	---	None	High	Low
Cf:							
Corbin-----	---	---	---	---	None	High	Low
Fa:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fm:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fn:							
Farnum-----	---	---	---	---	None	Moderate	Low
Fu:							
Farnum-----	---	---	---	---	None	Moderate	Low

SOIL FEATURES--Continued
Harper County, Kansas

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
		In					
Ge: Gerlane-----	---	---	---	---	None	Low	Low
Gn: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
Gr: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
GRP: Gravel Pits----	---	---	---	---	None	---	---
Gs: Grant-----	40-60	Bedrock (paralithic)	---	Weakly cemented	None	Moderate	Low
INT: Aguolls-----	---	---	---	---	Moderate	---	---
Ka: Kanza-----	---	---	---	---	None	High	Moderate
Kk: Kaski-----	---	---	---	---	None	Low	Low
Km: Kirkland-----	---	---	---	---	None	High	Low
Kr: Kirkland-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
Kw: Kirkland-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
Mc: Minco-----	---	---	---	---	None	Low	Low
Mn: Minco-----	---	---	---	---	None	Low	Low
Mo: Minco-----	---	---	---	---	None	Low	Low
Na: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Ne: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Nh: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Nn: Nashville-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
No: Norge-----	---	---	---	---	None	Moderate	Low
Pc: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pd: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pe: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Pg: Pond Creek-----	---	---	---	---	None	Moderate	Moderate
Ph: Dale-----	---	---	---	---	None	Moderate	Low
Pk: Port-----	---	---	---	---	None	High	Moderate
Pm: Pratt-----	---	---	---	---	None	Low	Moderate
Pn: Pratt-----	20-40	Bedrock (paralithic)	---	---	None	Low	Moderate
Po: Pratt-----	---	---	---	---	None	Low	Moderate
Carwile-----	---	---	---	---	None	High	Moderate
Pt: Pratt-----	---	---	---	---	None	Low	Moderate
Tivoli-----	---	---	---	---	None	Low	Low
Qa: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Qn: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Qu: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Rc: Renfrow-----	---	---	---	---	None	High	Low
Vernon-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	High	Low
Re: Ruella-----	8-20	Bedrock (paralithic)	---	Moderately cemented	None	Low	Low

Map symbol and soil name	Restrictive layer				Potential for Frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness		Uncoated Steel	Concrete
Rh: Ruella-----	8-20	In Bedrock (paralithic)	---	Moderately cemented	None	Low	Low
Ru: Ruella-----	8-20	Bedrock (paralithic)	---	Moderately cemented	None	Low	Low
Sa: Lesho-----	---	---	---	---	None	High	Low
Sb: Shellabarger----	---	---	---	---	None	Low	Moderate
Se: Shellabarger----	---	---	---	---	None	Low	Moderate
Sf: Shellabarger----	---	---	---	---	None	Low	Moderate
Sg: Shellabarger----	---	---	---	---	None	Low	Moderate
Sh: Zellmont-----	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
SHH: Shellabarger----	---	---	---	---	Low	Low	Moderate
Sk: Zellmont-----	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
Sm: Zellmont, eroded	20-39	Bedrock (paralithic)	---	Moderately cemented	None	Low	Moderate
Sn: Shellabarger----	---	---	---	---	None	Low	Moderate
So: Shellabarger----	---	---	---	---	None	Low	Moderate
Albion-----	---	---	---	---	None	Low	Low
Sp: Drummond-----	---	---	---	---	None	High	High
Ta: Tabler-----	---	---	---	---	None	High	Low
Th: Tivoli-----	---	---	---	---	None	Low	Low
Vr: Vernon-----	---	---	---	---	None	High	Low
Renfrow-----	---	---	---	---	None	High	Low
W: Water-----	---	---	---	---	None	---	Low
Wa: Kingman-----	---	---	---	---	None	High	Low
Wd: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
We: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Ww: Quinlan-----	10-20	Bedrock (paralithic)	---	Extremely weakly cemented	None	Moderate	Low
Woodward-----	20-40	Bedrock (paralithic)	---	Extremely weakly cemented	None	Low	Low
Za: Canadian-----	---	---	---	---	None	Low	Low
Zf: Zenda-----	---	---	---	---	None	High	Low

WATER MANAGEMENT
Harper 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
Harper 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
007AE: Albion-----	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope
007AS: Clairemont-----	Limitation: deep to water	Limitation: erodes easily excess salt flooding	Limitation: erodes easily	Limitation: erodes easily excess salt
007FU: Farnum-----	Limitation: deep to water	Favorable	Favorable	Favorable
007KA: Kanza-----	Limitation: flooding cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
095AD: Albion-----	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
095DA: Dillwyn-----	Limitation: cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
Plevna-----	Limitation: flooding	Limitation: flooding wetness soil blowing	Limitation: wetness soil blowing	Limitation: wetness
095LA: Lincoln-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
095NB: Nashville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: slope depth to rock	Limitation: slope depth to rock
Quinlan-----	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
095SA: Shellabarger----	Limitation: deep to water	Limitation: fast intake soil blowing	Limitation: soil blowing	Favorable
095SC: Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Favorable
095SD: Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Favorable
095ZA: Zenda-----	Limitation: flooding	Limitation: flooding wetness	Limitation: wetness	Favorable
191EA: Elandco-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
191EC: Elandco-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
191LS: Lincoln-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
191OP: Wellsford-----	Limitation: deep to water	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope depth to rock	Limitation: percs slowly slope depth to rock
Elandco-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily

WATER MANAGEMENT--Continued
Harper 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
191PD: Pond Creek-----	Limitation: deep to water	Limitation: slope	Limitation: erodes easily	Limitation: erodes easily
191RA: Renfrow-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Grainola-----	Limitation: deep to water	Limitation: percs slowly depth to rock droughty	Limitation: erodes easily percs slowly depth to rock	Limitation: erodes easily depth to rock droughty
191TA: Tabler-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
191US: Ustifluvents----	---	---	---	---
1439: Crisfield-----	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
An: Kaski-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
At: Attica-----	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
Be: Bethany-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Bh: Bethany-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Bm: Lincoln-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: too sandy soil blowing	Limitation: droughty
Bo: Gerlane-----	Limitation: deep to water	Limitation: fast intake soil blowing droughty	Limitation: percs slowly soil blowing	Limitation: percs slowly droughty
Bp: Woodward-----	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock	Limitation: erodes easily slope depth to rock
Port-----	Limitation: deep to water	Limitation: erodes easily flooding	Limitation: erodes easily	Limitation: erodes easily
Br: Broken Alluvial Land-----	Limitation: deep to water	Limitation: erodes easily flooding slope	Limitation: erodes easily slope	Limitation: erodes easily slope
Ca: Carwile-----	Limitation: percs slowly	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly rooting depth
Cc: Case-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Clark-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Ce: Corbin-----	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly
Cf: Corbin-----	Limitation: deep to water	Limitation: percs slowly	Limitation: percs slowly	Limitation: percs slowly
Fa: Farnum-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Fm: Farnum-----	Limitation: deep to water	Favorable	Favorable	Favorable
Fn: Farnum-----	Limitation: deep to water	Favorable	Favorable	Favorable

WATER MANAGEMENT--Continued
Harper 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
Fu: Farnum-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Ge: Gerlane-----	Limitation: flooding	Limitation: flooding wetness soil blowing	Limitation: wetness soil blowing	Favorable
Gn: Grant-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Gr: Grant-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
GRP: Gravel Pits-----	---	---	---	---
Gs: Grant-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
INT: Aquolls-----	---	---	---	---
Ka: Kanza-----	Limitation: flooding cutbanks cave	Limitation: fast intake wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
Kk: Kaski-----	Limitation: deep to water	Limitation: flooding	Favorable	Favorable
Km: Kirkland-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Kr: Kirkland-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Renfrow-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Kw: Kirkland-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily	Limitation: erodes easily percs slowly
Renfrow-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Mc: Minco-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Mn: Minco-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Mo: Minco-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
Na: Nashville-----	Limitation: deep to water	Limitation: depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Ne: Nashville-----	Limitation: deep to water	Limitation: depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Nh: Nashville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Nn: Nashville-----	Limitation: deep to water	Limitation: slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
No: Norge-----	Limitation: deep to water	Favorable	Favorable	Favorable
Pc: Pond Creek-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Pd: Pond Creek-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily

WATER MANAGEMENT--Continued
Harper 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
Pe: Pond Creek-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
Pg: Pond Creek-----	Limitation: deep to water	Limitation: erodes easily slope	Limitation: erodes easily	Limitation: erodes easily
Ph: Dale-----	Limitation: deep to water	Limitation: erodes easily	Limitation: erodes easily	Limitation: erodes easily
Pk: Port-----	Limitation: deep to water	Limitation: excess salt	Limitation: erodes easily	Limitation: erodes easily excess salt
Pm: Pratt-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing	Limitation: droughty
Pn: Pratt-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: too sandy soil blowing depth to rock	Limitation: depth to rock droughty
Po: Pratt-----	Limitation: slope cutbanks cave	Limitation: slope wetness droughty	Limitation: too sandy wetness soil blowing	Limitation: wetness droughty
Carwile-----	Limitation: percs slowly	Limitation: percs slowly wetness soil blowing	Limitation: erodes easily wetness soil blowing	Limitation: erodes easily percs slowly rooting depth
Pt: Pratt-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Tivoli-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Qa: Quinlan-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Qn: Quinlan-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Qu: Quinlan-----	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Rc: Renfrow-----	Limitation: deep to water	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
Vernon-----	Limitation: deep to water	Limitation: percs slowly rooting depth droughty	Limitation: erodes easily percs slowly	Limitation: erodes easily rooting depth droughty
Re: Ruella-----	Limitation: deep to water	Favorable	Favorable	Favorable
Rh: Ruella-----	Limitation: deep to water	Favorable	Favorable	Favorable
Ru: Ruella-----	Limitation: deep to water	Limitation: slope	Favorable	Favorable
Sa: Lesho-----	Limitation: excess salt flooding cutbanks cave	Limitation: excess salt flooding wetness	Limitation: too sandy wetness	Limitation: excess salt
Sb: Shellabarger----	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
Se: Shellabarger----	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable

WATER MANAGEMENT--Continued
Harper 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
Sf: Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Favorable
Sg: Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: soil blowing	Favorable
Sh: Zellmont-----	Limitation: deep to water	Limitation: soil blowing	Limitation: too sandy soil blowing	Favorable
SHH: Shellabarger----	Limitation: deep to water	Limitation: soil blowing	Limitation: soil blowing	Favorable
Sk: Zellmont-----	Limitation: deep to water	Limitation: soil blowing	Limitation: too sandy soil blowing	Favorable
Sm: Zellmont, eroded	Limitation: deep to water	Limitation: soil blowing	Limitation: too sandy soil blowing	Favorable
Sn: Shellabarger----	Limitation: deep to water	Limitation: fast intake soil blowing	Limitation: soil blowing	Favorable
So: Shellabarger----	Limitation: deep to water	Limitation: slope soil blowing	Limitation: slope soil blowing	Limitation: slope
Albion-----	Limitation: deep to water	Limitation: slope soil blowing droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Sp: Drummond-----	Limitation: excess sodium excess salt percs slowly	Limitation: percs slowly wetness droughty	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily excess sodium excess salt
Ta: Tabler-----	Limitation: percs slowly	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly wetness	Limitation: erodes easily percs slowly
Th: Tivoli-----	Limitation: deep to water	Limitation: fast intake slope droughty	Limitation: slope too sandy soil blowing	Limitation: slope droughty
Vr: Vernon-----	Limitation: deep to water	Limitation: percs slowly slope droughty	Limitation: erodes easily percs slowly	Limitation: erodes easily rooting depth droughty
Renfrow-----	Limitation: deep to water	Limitation: erodes easily percs slowly slope	Limitation: erodes easily percs slowly	Limitation: erodes easily percs slowly
W: Water-----	---	---	---	---
Wa: Kingman-----	Limitation: flooding	Limitation: flooding wetness	Limitation: wetness	Limitation: wetness
Wd: Quinlan-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Woodward-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
We: Quinlan-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Woodward-----	Limitation: deep to water	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Ww: Quinlan-----	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock

WATER MANAGEMENT--Continued
Harper 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
Woodward-----	Limitation: deep to water	Limitation: erodes easily slope depth to rock	Limitation: erodes easily depth to rock	Limitation: erodes easily depth to rock
Za: Canadian-----	Limitation: deep to water	Limitation: soil blowing droughty	Limitation: soil blowing	Limitation: droughty
Zf: Zenda-----	Limitation: flooding	Limitation: flooding wetness soil blowing	Limitation: wetness soil blowing	Favorable

WATER MANAGEMENT--Continued
Harper 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
007AE: Albion-----	55	Very limited Seepage	1.00	Somewhat limited Seepage	0.98	Very limited Deep to water	1.00
Shellabarger-----	45	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
007AS: Clairemont-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping Salinity	0.50 0.12	Very limited Deep to water	1.00
007FU: Farnum-----	100	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
007KA: Kanza-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.65	Very limited Cutbanks cave	1.00
095AD: Albion-----	100	Very limited Seepage Slope	1.00 0.00	Somewhat limited Seepage	0.98	Very limited Deep to water	1.00
095DA: Dillwyn-----	60	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.18	Very limited Cutbanks cave Deep to water	1.00 0.00
Plevna-----	40	Very limited Seepage	1.00	Very limited Seepage Depth to saturated zone	1.00 1.00	Very limited Cutbanks cave	1.00
095LA: Lincoln-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.39	Very limited Deep to water	1.00
095NB: Nashville-----	60	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Very limited Piping Thin layer	1.00 0.91	Very limited Deep to water	1.00
Quinlan-----	40	Very limited Seepage Depth to bedrock	1.00 0.74	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
095SA: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
095SC: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
095SD: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
095ZA: Zenda-----	100	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone Piping	0.43 0.14	Somewhat limited Slow refill Deep to water Cutbanks cave	0.30 0.25 0.10
191EA: Elandco-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.38	Very limited Deep to water	1.00
191EC: Elandco-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.81	Very limited Deep to water	1.00
191LS: Lincoln-----	100	Very limited		Somewhat limited		Very limited	

WATER MANAGEMENT--Continued
Harper 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
191OP: Wellsford-----	65	Seepage	1.00	Seepage	0.39	Deep to water	1.00
Elandco-----	35	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
191PD: Pond Creek-----	100	Depth to bedrock Slope	0.66 0.02	Hard to pack	0.50	Very limited Deep to water	1.00
191RA: Renfrow-----	70	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.81	Very limited Deep to water	1.00
191TA: Tabler-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.67	Very limited Deep to water	1.00
191US: Ustifluvents-----	100	Not limited		Somewhat limited Hard to pack	0.19	Very limited Deep to water	1.00
1439: Crisfield-----	100	Somewhat limited Depth to bedrock	0.03	Somewhat limited Thin layer Hard to pack	0.66 0.50	Very limited Deep to water	1.00
An: Kaski-----	100	Not limited		Somewhat limited Depth to saturated zone Hard to pack	0.43 0.16	Very limited Deep to water	1.00
At: Attica-----	100	Very limited Seepage	1.00	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Be: Bethany-----	100	Very limited Seepage	1.00	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
Bh: Bethany-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.78 0.18	Very limited Cutbanks cave Deep to water	1.00 0.44
Bm: Lincoln-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping Seepage	0.78 0.09	Very limited Deep to water	1.00
Bo: Gerlane-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Bp: Woodward-----	65	Not limited		Not limited		Very limited Deep to water	1.00
Br: Broken Alluvial Land	100	Not limited		Not limited		Very limited Deep to water	1.00
Port-----	35	Somewhat limited Seepage	0.70	Very limited Piping Thin layer	1.00 0.85	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.70	Somewhat limited Piping	0.82	Very limited Deep to water	1.00
		Somewhat limited Seepage	0.70	Somewhat limited Piping	0.88	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Harper 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
Ca: Carwile-----	100	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Seepage	1.00 0.07	Somewhat limited Slow refill	0.30
						Cutbanks cave	0.10
Cc: Case-----	70	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.12	Very limited Deep to water	1.00
Clark-----	30	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.12	Very limited Deep to water	1.00
Ce: Corbin-----	100	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Cf: Corbin-----	100	Somewhat limited Seepage	0.70	Not limited		Very limited Deep to water	1.00
Fa: Farnum-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.10	Very limited Deep to water	1.00
Fm: Farnum-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
Fn: Farnum-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
Fu: Farnum-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.13	Very limited Deep to water	1.00
Ge: Gerlane-----	100	Very limited Seepage	1.00	Very limited Piping Seepage	1.00 0.09	Very limited Cutbanks cave Deep to water Slow refill	1.00 0.81 0.43
Gn: Grant-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.00	Very limited Piping Thin layer	1.00 0.11	Very limited Deep to water	1.00
Gr: Grant-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.00	Very limited Piping Thin layer	1.00 0.11	Very limited Deep to water	1.00
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.00	Very limited Piping Thin layer	1.00 0.11	Very limited Deep to water	1.00
INT: Aquolls-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Somewhat limited Cutbanks cave	0.10
Ka: Kanza-----	100	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 0.65	Very limited Cutbanks cave	1.00
Kk: Kaski-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping Seepage	0.76 0.09	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Harper 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
Km: Kirkland-----	100	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.20	Very limited Deep to water	1.00
Kr: Kirkland-----	70	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.22	Very limited Deep to water	1.00
Renfrow-----	30	Not limited		Somewhat limited Hard to pack	0.19	Very limited Deep to water	1.00
Kw: Kirkland-----	70	Somewhat limited Seepage	0.05	Somewhat limited Hard to pack	0.26	Very limited Deep to water	1.00
Renfrow-----	30	Not limited		Somewhat limited Hard to pack	0.21	Very limited Deep to water	1.00
Mc: Minco-----	100	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Mn: Minco-----	100	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Mo: Minco-----	100	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
Na: Nashville-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Very limited Piping Thin layer	1.00 0.91	Very limited Deep to water	1.00
Ne: Nashville-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Very limited Piping Thin layer	1.00 0.91	Very limited Deep to water	1.00
Nh: Nashville-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.17	Very limited Piping Thin layer	1.00 0.91	Very limited Deep to water	1.00
Nn: Nashville-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.11	Very limited Piping Thin layer	1.00 0.86	Very limited Deep to water	1.00
No: Norge-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.08	Very limited Deep to water	1.00
Pc: Pond Creek-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.73	Very limited Deep to water	1.00
Pd: Pond Creek-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.73	Very limited Deep to water	1.00
Pe: Pond Creek-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.73	Very limited Deep to water	1.00
Pg: Pond Creek-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.68	Very limited Deep to water	1.00
Ph: Dale-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.82	Very limited Deep to water	1.00
Pk: Port-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping Salinity	0.52 0.12	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Harper County, Kansas

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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
Pm: Pratt-----	100	Very limited Seepage	1.00	Very limited Seepage	1.00	Very limited Deep to water	1.00
Pn: Pratt-----	100	Very limited Seepage Depth to bedrock	1.00 0.11	Somewhat limited Thin layer Seepage	0.85 0.18	Very limited Deep to water	1.00
Po: Pratt-----	65	Very limited Seepage	1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Cutbanks cave	1.00
Carwile-----	35	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Seepage	1.00 0.02	Somewhat limited Slow refill Cutbanks cave	0.30 0.10
Pt: Pratt-----	50	Very limited Seepage Slope	1.00 0.00	Very limited Seepage	1.00	Very limited Deep to water	1.00
Tivoli-----	50	Very limited Seepage Slope	1.00 0.00	Somewhat limited Seepage	0.99	Very limited Deep to water	1.00
Qa: Quinlan-----	100	Very limited Seepage Depth to bedrock	1.00 0.84	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Qn: Quinlan-----	100	Very limited Seepage Depth to bedrock	1.00 0.84	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Qu: Quinlan-----	100	Very limited Seepage Depth to bedrock	1.00 0.84	Very limited Thin layer	1.00	Very limited Deep to water	1.00
Rc: Renfrow-----	65	Not limited		Somewhat limited Hard to pack	0.19	Very limited Deep to water	1.00
Vernon-----	35	Somewhat limited Depth to bedrock	0.08	Very limited Piping Thin layer	1.00 0.81	Very limited Deep to water	1.00
Re: Ruella-----	100	Somewhat limited Depth to bedrock Seepage	0.87 0.70	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
Rh: Ruella-----	100	Somewhat limited Depth to bedrock Seepage	0.87 0.70	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
Ru: Ruella-----	100	Somewhat limited Depth to bedrock Seepage	0.87 0.70	Very limited Thin layer Piping	1.00 1.00	Very limited Deep to water	1.00
Sa: Lesho-----	100	Very limited Seepage	1.00	Very limited Piping Seepage Depth to saturated zone Salinity	1.00 0.93 0.43 0.12	Very limited Cutbanks cave Salty water Deep to water	1.00 0.50 0.25
Sb: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
Harper 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
Se: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Sf: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Sg: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Sh: Zellmont-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.08	Somewhat limited Thin layer	0.81	Very limited Deep to water	1.00
SHH: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Sk: Zellmont-----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.08	Somewhat limited Thin layer	0.81	Very limited Deep to water	1.00
Sm: Zellmont, eroded----	100	Somewhat limited Seepage Depth to bedrock	0.70 0.08	Somewhat limited Thin layer	0.81	Very limited Deep to water	1.00
Sn: Shellabarger-----	100	Somewhat limited Seepage	0.70	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
So: Shellabarger-----	70	Somewhat limited Seepage Slope	0.70 0.00	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Albion-----	30	Very limited Seepage Slope	1.00 0.00	Somewhat limited Seepage	0.49	Very limited Deep to water	1.00
Sp: Drummond-----	100	Not limited		Somewhat limited Depth to saturated zone Salinity	0.43 0.12	Somewhat limited Salty water Deep to water Cutbanks cave	0.50 0.25 0.10
Ta: Tabler-----	100	Not limited		Somewhat limited Depth to saturated zone Hard to pack	0.43 0.16	Very limited Deep to water	1.00
Th: Tivoli-----	100	Very limited Seepage Slope	1.00 0.00	Somewhat limited Seepage	0.99	Very limited Deep to water	1.00
Vr: Vernon-----	60	Not limited		Very limited Piping	1.00	Very limited Deep to water	1.00
Renfrow-----	40	Not limited		Somewhat limited Hard to pack	0.21	Very limited Deep to water	1.00
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Piping	1.00 0.88	Somewhat limited Slow refill Cutbanks cave	0.43 0.10

WATER MANAGEMENT--Continued
Harper 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
Wd: Quinlan-----	50	Very limited Seepage	1.00	Seepage	0.08	Very limited Deep to water	1.00
		Depth to bedrock	0.84	Thin layer	1.00		
Woodward-----	50	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		
We: Quinlan-----	50	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.84				
Woodward-----	50	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.30	Thin layer	0.98		
Ww: Quinlan-----	50	Very limited Seepage	1.00	Very limited Thin layer	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.84				
Woodward-----	50	Somewhat limited Seepage	0.70	Very limited Piping	1.00	Very limited Deep to water	1.00
		Depth to bedrock	0.11	Thin layer	0.85		
Za: Canadian-----	100	Very limited Seepage	1.00	Very limited Piping	1.00	Very limited Deep to water	1.00
				Seepage	0.67		
Zf: Zenda-----	100	Somewhat limited Seepage	0.70	Somewhat limited Depth to saturated zone	0.43	Somewhat limited Slow refill	0.30
				Piping	0.21	Deep to water	0.25
				Seepage	0.08	Cutbanks cave	0.10

SANITARY FACILITIES
Harper 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
Harper 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
Harper 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
007AE: Albion-----	55	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Shellabarger-----	45	Slope	0.16	Slope	1.00
		Somewhat limited Restricted permeability	0.50	Very limited Slope	1.00
		Slope	0.16	Seepage	0.50
007AS: Clairemont-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
007FU: Farnum-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
				Slope	0.00
007KA: Kanza-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
095AD: Albion-----	100	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
		Slope	0.37	Slope	1.00
095DA: Dillwyn-----	60	Very limited Depth to saturated zone	1.00	Very limited Seepage	1.00
		Filtering capacity	1.00	Depth to saturated zone	1.00
Plevna-----	40	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
				Depth to saturated zone	1.00
095LA: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00
		Depth to saturated zone	0.08		
095NB: Nashville-----	60	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.04		
Quinlan-----	40	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Slope	0.16	Slope	1.00
095SA: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
				Slope	0.00
095SC: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope	0.67
				Seepage	0.50
095SD: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope	0.67
				Seepage	0.50
095ZA: Zenda-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00

SANITARY FACILITIES--Continued
Harper 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
191EA: Elandco-----	100	Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.50	Seepage	0.50
191EC: Elandco-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
191LS: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
191OP: Wellsford-----	65	Very limited Filtering capacity	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00		
		Depth to bedrock	0.08		
Elandco-----	35	Slope	0.96	Depth to soft bedrock	1.00
		Very limited Flooding	1.00	Slope	1.00
191PD: Pond Creek-----	100	Restricted permeability	0.50	Very limited Flooding	1.00
		Very limited Flooding	1.00	Seepage	0.50
191RA: Renfrow-----	70	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.33
		Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Grainola-----	30	Very limited Restricted permeability	1.00	Very limited Depth to soft bedrock	1.00
		Depth to bedrock	1.00	Slope	0.00
191TA: Tabler-----	100	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
191US: Ustifluvents-----	100	Very limited Slope	1.00	Very limited Slope	1.00
1439: Crisfield-----	100	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Flooding	0.40	Flooding	0.40
An: Kaski-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
At: Attica-----	100	Not limited		Very limited Seepage	1.00
				Slope	0.00
Be: Bethany-----	100	Very limited Restricted permeability	1.00	Not limited	
Bh: Bethany-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Bm: Lincoln-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Filtering capacity	1.00	Seepage	1.00

SANITARY FACILITIES--Continued
Harper 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
Bo: Gerlane-----	100	Depth to saturated zone	0.08		
		Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	1.00	Seepage	1.00
		Filtering capacity	1.00		
Bp: Woodward-----	65	Depth to saturated zone	0.40		
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	1.00
		Slope	0.37		
Port-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00
		Restricted permeability	0.50	Seepage	0.50
				Slope	0.00
Br: Broken Alluvial Land	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Slope	1.00	Slope	1.00
		Restricted permeability	0.50	Seepage	0.50
Ca: Carwile-----	100	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Seepage	0.32
Cc: Case-----	70	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
				Slope	0.33
Clark-----	30	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
				Slope	0.33
Ce: Corbin-----	100	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
Cf: Corbin-----	100	Very limited Restricted permeability	1.00	Somewhat limited Seepage	0.50
Fa: Farnum-----	100	Somewhat limited Restricted permeability	0.50	Slope	0.00
				Seepage	0.50
Fm: Farnum-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Fn: Farnum-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Fu: Farnum-----	100	Somewhat limited Restricted permeability	0.50	Slope	0.00
				Somewhat limited Slope	0.67
Ge: Gerlane-----	100	Somewhat limited Restricted permeability	0.50	Seepage	0.50
		Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Seepage	1.00
		Restricted permeability	0.68	Depth to saturated zone	0.71

SANITARY FACILITIES--Continued
Harper 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
Gn: Grant-----	100	Somewhat limited Depth to bedrock Restricted permeability	0.78 0.50	Somewhat limited Seepage Depth to soft bedrock	0.50 0.42
Gr: Grant-----	100	Somewhat limited Depth to bedrock Restricted permeability	0.78 0.50	Somewhat limited Seepage Depth to soft bedrock Slope	0.50 0.42 0.00
GRP: Gravel Pits-----	100	Not rated		Not rated	
Gs: Grant-----	100	Somewhat limited Depth to bedrock Restricted permeability	0.78 0.50	Somewhat limited Slope Seepage Depth to soft bedrock	0.67 0.50 0.42
INT: Aquolls-----	100	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone Filtering capacity	1.00 1.00 1.00	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 1.00
Kk: Kaski-----	100	Very limited Flooding Restricted permeability	1.00 0.50	Very limited Flooding Seepage	1.00 0.50
Km: Kirkland-----	100	Very limited Restricted permeability	1.00	Not limited	
Kr: Kirkland-----	70	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Renfrow-----	30	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Kw: Kirkland-----	70	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Renfrow-----	30	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Mc: Minco-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Mn: Minco-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage Slope	0.50 0.00
Mo: Minco-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope Seepage	0.67 0.50
Na: Nashville-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50
Ne: Nashville-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50

SANITARY FACILITIES--Continued
Harper 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
Nh: Nashville-----	100	Very limited Depth to bedrock	1.00	Slope Very limited Depth to soft bedrock	0.00 1.00
Nn: Nashville-----	100	Very limited Depth to bedrock Restricted permeability	1.00 0.50	Slope Seepage Very limited Depth to soft bedrock Slope Seepage	0.67 0.50 1.00 0.67 0.50
No: Norge-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Pc: Pond Creek-----	100	Very limited Restricted permeability	1.00	Not limited	
Pd: Pond Creek-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Pe: Pond Creek-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.67
Pg: Pond Creek-----	100	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.67
Ph: Dale-----	100	Somewhat limited Restricted permeability Flooding	0.50 0.40	Somewhat limited Seepage Flooding	0.50 0.40
Pk: Port-----	100	Somewhat limited Restricted permeability Flooding Depth to saturated zone	0.50 0.40 0.22	Somewhat limited Seepage Flooding	0.50 0.40
Pm: Pratt-----	100	Very limited Filtering capacity	1.00	Very limited Seepage Slope	1.00 0.91
Pn: Pratt-----	100	Very limited Depth to bedrock Filtering capacity	1.00 1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 1.00 0.91
Po: Pratt-----	65	Very limited Depth to saturated zone Filtering capacity	1.00 1.00	Very limited Seepage Depth to saturated zone Slope	1.00 1.00 0.91
Carwile-----	35	Very limited Restricted permeability Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.32
Pt: Pratt-----	50	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00
Tivoli-----	50	Very limited Filtering capacity Slope	1.00 0.63	Very limited Slope Seepage	1.00 1.00

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
Qa: Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Qn: Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 0.00
Qu: Quinlan-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope	1.00 0.67
Rc: Renfrow-----	65	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.00
Vernon-----	35	Very limited Restricted permeability Depth to bedrock	1.00 1.00	Very limited Depth to soft bedrock Slope	1.00 0.00
Re: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage	1.00 0.50
Rh: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.00
Ru: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock Slope Seepage	1.00 0.67 0.50
Sa: Lesho-----	100	Very limited Flooding Restricted permeability Depth to saturated zone Filtering capacity	1.00 1.00 1.00 1.00	Very limited Flooding Seepage Depth to saturated zone	1.00 1.00 1.00
Sb: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
Se: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage Slope	0.50 0.00
Sf: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope Seepage	0.67 0.50
Sg: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Slope Seepage	0.67 0.50
Sh: Zellmont-----	100	Very limited Depth to bedrock Restricted permeability	1.00 1.00	Very limited Depth to soft bedrock Seepage Slope	1.00 0.50 0.00
SHH: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage Slope	0.50 0.00

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
Sk: Zellmont-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	0.67
				Seepage	0.50
Sm: Zellmont, eroded----	100	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	1.00	Slope	0.67
				Seepage	0.50
Sn: Shellabarger-----	100	Somewhat limited Restricted permeability	0.50	Somewhat limited Seepage	0.50
				Slope	0.00
So: Shellabarger-----	70	Somewhat limited Restricted permeability	0.50	Very limited Slope	1.00
		Slope	0.37	Seepage	0.50
Albion-----	30	Very limited Filtering capacity	1.00	Very limited Seepage	1.00
		Slope	0.37	Slope	1.00
Sp: Drummond-----	100	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
Ta: Tabler-----	100	Very limited Restricted permeability	1.00	Very limited Depth to saturated zone	1.00
		Depth to saturated zone	1.00		
Th: Tivoli-----	100	Very limited Filtering capacity	1.00	Very limited Slope	1.00
		Slope	0.63	Seepage	1.00
Vr: Vernon-----	60	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.33
Renfrow-----	40	Very limited Restricted permeability	1.00	Somewhat limited Slope	0.33
W: Water-----	100	Not rated		Not rated	
Wa: Kingman-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00
		Depth to saturated zone	1.00	Depth to saturated zone	1.00
		Restricted permeability	0.68	Seepage	0.32
Wd: Quinlan-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
		Restricted permeability	0.50	Slope	0.00
We: Quinlan-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
Ww: Quinlan-----	50	Restricted permeability	0.50	Slope	0.00
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock	1.00	Slope	0.67
		Very limited Depth to bedrock	1.00	Very limited Depth to soft bedrock	1.00
Za: Canadian-----	100	Restricted permeability	0.50	Slope	0.67
		Very limited Filtering capacity	1.00	Very limited Seepage	1.00
Zf: Zenda-----	100	Flooding	0.40	Flooding	0.40
		Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00
		Restricted permeability	0.50	Seepage	0.50

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
007AE: Albion-----	55	Very limited Seepage Too Sandy Slope	1.00 1.00 0.16	Very limited Seepage Slope	1.00 0.16	Very limited Too Sandy Seepage Slope Gravel content	1.00 1.00 0.16 0.00
Shellabarger-----	45	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16	Somewhat limited Slope	0.16
007AS: Clairemont-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
007FU: Farnum-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
007KA: Kanza-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Too Sandy	1.00 1.00 0.50
095AD: Albion-----	100	Very limited Seepage Too Sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Too Sandy Seepage Slope Gravel content	1.00 1.00 0.37 0.00
095DA: Dillwyn-----	60	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Seepage	1.00
Plevna-----	40	Too Sandy Very limited Flooding	1.00 1.00	Very limited Flooding	1.00	Depth to saturated zone Too Sandy	0.86 0.50
		Depth to saturated zone Seepage	1.00 1.00	Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 0.50
095LA: Lincoln-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
095NB: Nashville-----	60	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04	Very limited Depth to bedrock Slope	1.00 0.04
Quinlan-----	40	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16	Very limited Depth to bedrock Slope	1.00 0.16
095SA: Shellabarger-----	100	Not limited		Not limited		Not limited	
095SC: Shellabarger-----	100	Not limited		Not limited		Not limited	
095SD: Shellabarger-----	100	Not limited		Not limited		Not limited	
095ZA: Zenda-----	100	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.09
191EA: Elandco-----	100	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
191EC: Elandco-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
191LS: Lincoln-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00

SANITARY FACILITIES--Continued
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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
191OP: Wellsford-----	65	Very limited Depth to bedrock Too clayey Seepage Slope	1.00 1.00 1.00 0.96	Very limited Depth to bedrock Slope	1.00 0.96	Very limited Depth to bedrock Too clayey Hard to compact Slope	1.00 1.00 1.00 0.96
Elandco-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
191PD: Pond Creek-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
191RA: Renfrow-----	70	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Grainola-----	30	Very limited Depth to bedrock Too clayey Seepage	1.00 1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Hard to compact	1.00 1.00 1.00
191TA: Tabler-----	100	Very limited Too clayey Depth to saturated zone	1.00 0.44	Not limited		Very limited Too clayey Hard to compact Depth to saturated zone	1.00 1.00 0.09
191US: Ustifluvents-----	100	Very limited Slope	1.00	Very limited Slope	1.00	Very limited Slope	1.00
1439: Crisfield-----	100	Very limited Depth to saturated zone Seepage Too Sandy Flooding	1.00 1.00 1.00 0.40	Very limited Depth to saturated zone Seepage Flooding	1.00 1.00 0.40	Very limited Too Sandy Seepage Depth to saturated zone	1.00 1.00 0.01
An: Kaski-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
At: Attica-----	100	Very limited Seepage	1.00	Very limited Seepage	1.00	Somewhat limited Seepage	0.50
Be: Bethany-----	100	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Bh: Bethany-----	100	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Bm: Lincoln-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Too Sandy Seepage	1.00 1.00
Bo: Gerlane-----	100	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Too clayey Hard to compact	1.00 1.00
Bp: Woodward-----	65	Very limited Depth to bedrock Seepage Slope	1.00 1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37	Very limited Depth to bedrock Slope	1.00 0.37
Port-----	35	Very limited Flooding Too clayey	1.00 0.50	Very limited Flooding	1.00	Somewhat limited Too clayey	0.50
Br: Broken Alluvial Land	100	Very limited Flooding Slope	1.00 1.00	Very limited Flooding Slope	1.00 1.00	Very limited Slope	1.00
Ca: Carwile-----	100	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00

SANITARY FACILITIES--Continued
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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
Cc: Case-----	70	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Clark-----	30	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ce: Corbin-----	100	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Cf: Corbin-----	100	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Fa: Farnum-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Fm: Farnum-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Fn: Farnum-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Fu: Farnum-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ge: Gerlane-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Somewhat limited Seepage	0.50
Gn: Grant-----	100	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Somewhat limited Depth to bedrock	0.42	Somewhat limited Too clayey Depth to bedrock	0.50 0.42
Gr: Grant-----	100	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Somewhat limited Depth to bedrock	0.42	Somewhat limited Too clayey Depth to bedrock	0.50 0.42
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Very limited Depth to bedrock Seepage Too clayey	1.00 1.00 0.50	Somewhat limited Depth to bedrock	0.42	Somewhat limited Too clayey Depth to bedrock	0.50 0.42
INT: Aquolls-----	100	Very limited Depth to saturated zone Ponding Seepage	1.00 1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00	Very limited Depth to saturated zone Ponding	1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Seepage Depth to saturated zone Too Sandy	1.00 1.00 0.50
Kk: Kaski-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Not limited	
Km: Kirkland-----	100	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Kr: Kirkland-----	70	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Renfrow-----	30	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Kw: Kirkland-----	70	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Renfrow-----	30	Very limited Too clayey	1.00	Not limited		Very limited Too clayey	1.00

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
						Hard to compact	1.00
Mc: Minco-----	100	Not limited		Not limited		Not limited	
Mn: Minco-----	100	Not limited		Not limited		Not limited	
Mo: Minco-----	100	Not limited		Not limited		Not limited	
Na: Nashville-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Ne: Nashville-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Nh: Nashville-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Nn: Nashville-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
No: Norge-----	100	Somewhat limited Too clayey	0.50	Not limited		Very limited Hard to compact Too clayey	1.00 0.50
Pc: Pond Creek-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Pd: Pond Creek-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Pe: Pond Creek-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Pg: Pond Creek-----	100	Somewhat limited Too clayey	0.50	Not limited		Somewhat limited Too clayey	0.50
Ph: Dale-----	100	Somewhat limited Flooding	0.40	Somewhat limited Flooding	0.40	Not limited	
Pk: Port-----	100	Very limited Depth to saturated zone Flooding	1.00 0.40	Very limited Depth to saturated zone Flooding	1.00 0.40	Not limited	
Pm: Pratt-----	100	Very limited Seepage Too Sandy	1.00 1.00	Very limited Seepage	1.00	Very limited Seepage Too Sandy	1.00 1.00
Pn: Pratt-----	100	Very limited Depth to bedrock Too Sandy Seepage	1.00 1.00 1.00	Very limited Seepage Depth to bedrock	1.00 1.00	Very limited Depth to bedrock Seepage Too Sandy	1.00 1.00 0.50
Po: Pratt-----	65	Very limited Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Seepage Too Sandy Depth to saturated zone	1.00 1.00 1.00
Carwile-----	35	Very limited Depth to saturated zone Too clayey	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone Too clayey Hard to compact	1.00 1.00 1.00
Pt: Pratt-----	50	Very limited Seepage Too Sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too Sandy Seepage Slope	1.00 1.00 0.63
Tivoli-----	50	Very limited Seepage Too Sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too Sandy Seepage Slope	1.00 1.00 0.63
Qa: Quinlan-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00

SANITARY FACILITIES--Continued
Harper County, Kansas

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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
Qn: Quinlan-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Qu: Quinlan-----	100	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rc: Renfrow-----	65	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
Vernon-----	35	Very limited Depth to bedrock Too clayey Sodium content	1.00 1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock Too clayey Sodium content Hard to compact	1.00 1.00 1.00 1.00
Re: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Rh: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Ru: Ruella-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Sa: Lesho-----	100	Very limited Flooding Depth to saturated zone Seepage Too Sandy	1.00 1.00 1.00 1.00	Very limited Flooding Depth to saturated zone Seepage	1.00 1.00 1.00	Very limited Too Sandy Seepage Depth to saturated zone	1.00 1.00 0.09
Sb: Shellabarger-----	100	Not limited		Not limited		Not limited	
Se: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sf: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sg: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sh: Zellmont-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
SHH: Shellabarger-----	100	Not limited		Not limited		Not limited	
Sk: Zellmont-----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Sm: Zellmont, eroded----	100	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Sn: Shellabarger-----	100	Not limited		Not limited		Not limited	
So: Shellabarger-----	70	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37	Somewhat limited Slope	0.37
Albion-----	30	Very limited Seepage Too Sandy Slope	1.00 1.00 0.37	Very limited Seepage Slope	1.00 0.37	Very limited Seepage Too Sandy Slope Gravel content	1.00 0.50 0.37 0.01
Sp: Drummond-----	100	Very limited Depth to saturated zone Seepage	1.00 1.00	Very limited Depth to saturated zone	1.00	Very limited Hard to compact Depth to saturated zone	1.00 0.09
Ta: Tabler-----	100	Very limited Too clayey Depth to saturated zone	1.00 0.44	Not limited		Very limited Too clayey Hard to compact Depth to saturated zone	1.00 1.00 0.09
Th: Tivoli-----	100	Very limited Seepage Too Sandy Slope	1.00 1.00 0.63	Very limited Seepage Slope	1.00 0.63	Very limited Too Sandy Seepage Slope	1.00 1.00 0.63

SANITARY FACILITIES--Continued
Harper 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
Vr: Vernon-----	60	Very limited Too clayey Sodium content	1.00 1.00	Not limited		Very limited Too clayey Sodium content Hard to compact	1.00 1.00 1.00
Renfrow-----	40	Very limited Too clayey	1.00	Not limited		Very limited Too clayey Hard to compact	1.00 1.00
W: Water-----	100	Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Depth to saturated zone	1.00
Wd: Quinlan-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
We: Quinlan-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Ww: Quinlan-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Woodward-----	50	Very limited Depth to bedrock Seepage	1.00 1.00	Very limited Depth to bedrock	1.00	Very limited Depth to bedrock	1.00
Za: Canadian-----	100	Very limited Too Sandy Seepage Flooding	1.00 1.00 0.40	Very limited Seepage Flooding	1.00 0.40	Very limited Seepage Too Sandy	1.00 0.50
Zf: Zenda-----	100	Very limited Flooding Depth to saturated zone Too clayey	1.00 1.00 0.50	Very limited Flooding Depth to saturated zone	1.00 1.00	Somewhat limited Too clayey Depth to saturated zone	0.50 0.09

AGRICULTURAL WASTE MANAGEMENT
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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
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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
Harper County, Kansas

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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		
007AE: Albion-----	55	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Too steep for surface application	1.00		
		Slope	0.16	Slope	0.16	Filtering capacity	1.00		
		Too acid	0.03	Too acid	0.14	Too steep for sprinkler application	0.39		
Shellabarger-----	45	Somewhat limited Slope	0.16	Somewhat limited Too acid	0.42	Too acid	0.14		
						Very limited Too steep for surface application	1.00		
		Too acid	0.11	Slope	0.16	Too acid	0.42		
						Too steep for sprinkler application	0.39		
007AS: Clairemont-----	100	Very limited Flooding Salinity	1.00 0.50	Very limited Flooding Salinity	1.00 1.00	Very limited Flooding Salinity	1.00 1.00		
007FU: Farnum-----	100	Not limited		Not limited		Not limited			
007KA: Kanza-----	100	Very limited Flooding Depth to saturated zone Filtering capacity Droughty Runoff limitation	1.00 1.00 1.00 0.48 0.40	Very limited Flooding Depth to saturated zone Filtering capacity Droughty Too acid	1.00 1.00 1.00 0.48 0.14	Very limited Flooding Depth to saturated zone Filtering capacity Droughty Too acid	1.00 1.00 1.00 0.48 0.14		
095AD: Albion-----	100	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Too steep for surface application	1.00		
		Slope	0.37	Slope	0.37	Filtering capacity	1.00		
		Too acid	0.03	Too acid	0.14	Too steep for sprinkler application	0.59		
		Droughty	0.00	Droughty	0.00	Too acid Droughty	0.14 0.00		
095DA: Dillwyn-----	60	Very limited Filtering capacity Depth to saturated zone Leaching limitation Droughty	1.00 1.00 0.45 0.21	Very limited Filtering capacity Depth to saturated zone Droughty	1.00 1.00 0.21	Very limited Filtering capacity Depth to saturated zone Droughty	1.00 1.00 0.21		
		Plevna-----	40	Very limited Flooding Depth to saturated zone Runoff limitation Filtering capacity	1.00 1.00 0.40 0.00	Very limited Flooding Depth to saturated zone Filtering capacity	1.00 1.00 0.00	Very limited Flooding Depth to saturated zone Filtering capacity	1.00 1.00 0.00
				095LA: Lincoln-----	100	Very limited Filtering capacity Droughty Flooding Leaching limitation	1.00 0.96 0.60 0.45	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.96
095NB: Nashville-----	60	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65	Very limited Too steep for surface application	1.00		
		Slope	0.04	Slope	0.04	Depth to bedrock	0.65		

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper County, Kansas

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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
Quinlan-----	40	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.16	Very limited Depth to bedrock Droughty Slope	1.00 1.00 0.16	Too steep for sprinkler application Very limited Depth to bedrock Droughty Too steep for surface application Too steep for sprinkler application	0.22 1.00 1.00 1.00 0.39
095SA: Shellabarger-----	100	Very limited Filtering capacity Too acid	1.00 0.11	Very limited Filtering capacity Too acid	1.00 0.42	Very limited Filtering capacity Too acid	1.00 0.42
095SC: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid Too steep for surface application	0.42 0.31
095SD: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid Too steep for surface application	0.42 0.31
095ZA: Zenda-----	100	Somewhat limited Flooding Depth to saturated zone	0.60 0.43	Very limited Flooding Depth to saturated zone	1.00 0.43	Somewhat limited Flooding Depth to saturated zone	0.60 0.43
191EA: Elandco-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
191EC: Elandco-----	100	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
191LS: Lincoln-----	100	Very limited Flooding Filtering capacity Droughty Leaching limitation	1.00 1.00 0.95 0.45	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.95	Very limited Flooding Filtering capacity Droughty	1.00 1.00 0.95
191OP: Wellsford-----	65	Very limited Restricted permeability Depth to bedrock Droughty Slope Runoff limitation	1.00 1.00 1.00 0.96 0.40	Very limited Droughty Restricted permeability Depth to bedrock Slope	1.00 1.00 1.00 0.96	Very limited Droughty Restricted permeability Depth to bedrock Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00 1.00 0.97
Elandco-----	35	Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
191PD: Pond Creek-----	100	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Restricted permeability Too steep for surface application Too acid	0.22 0.08 0.07
191RA: Renfrow-----	70	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Grainola-----	30	Very limited		Very limited		Very limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper County, Kansas

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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
191TA: Tabler-----	100	Restricted permeability	1.00	Restricted permeability	1.00	Restricted permeability	1.00
		Runoff limitation	0.40	Depth to bedrock	0.06	Depth to bedrock	0.06
191US: Ustifluvents-----	100	Depth to bedrock	0.06	Droughty	0.05	Droughty	0.05
		Droughty	0.05	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
1439: Crisfield-----	100	Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43
		Runoff limitation	0.40	Very limited Low adsorption	1.00	Very limited Low adsorption	1.00
An: Kaski-----	100	Slope	1.00	Slope	1.00	Too steep for surface application	1.00
		Very limited	1.00	Very limited	1.00	Too steep for sprinkler application	1.00
At: Attica-----	100	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Too acid	0.37	Too acid	0.96	Too acid	0.96
Be: Bethany-----	100	Depth to saturated zone	0.18	Flooding	0.40	Depth to saturated zone	0.18
		Droughty	0.11	Depth to saturated zone	0.18	Droughty	0.11
Bh: Bethany-----	100	Droughty	0.11	Droughty	0.11	Droughty	0.11
		Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00
Bm: Lincoln-----	100	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Bo: Gerlane-----	100	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
Bp: Woodward-----	65	Flooding	0.60	Flooding	1.00	Flooding	0.60
		Leaching limitation	0.45	Droughty	0.83	Droughty	0.83
Port-----	35	Droughty	0.55	Droughty	0.55	Droughty	0.55
		Leaching limitation	0.45	Very limited Flooding	1.00	Very limited Restricted permeability	1.00
Port-----	35	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Flooding	1.00	Filtering capacity	1.00	Filtering capacity	1.00
Port-----	35	Flooding	1.00	Flooding	1.00	Flooding	1.00
		Very limited Flooding	1.00	Very limited Flooding	1.00	Very limited Flooding	1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper 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
Br: Broken Alluvial Land	100	Very limited Flooding Slope	1.00 1.00	Very limited Flooding Slope	1.00 1.00	Very limited Flooding Too steep for surface application Too steep for sprinkler application	1.00 1.00 1.00
Ca: Carwile-----	100	Very limited Depth to saturated zone Restricted permeability Runoff limitation Too acid	1.00 1.00 0.40 0.02	Very limited Depth to saturated zone Restricted permeability Too acid	1.00 1.00 0.07	Very limited Depth to saturated zone Restricted permeability Too acid	1.00 1.00 0.07
Cc: Case-----	70	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Clark-----	30	Not limited		Not limited		Somewhat limited Too steep for surface application	0.08
Ce: Corbin-----	100	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Cf: Corbin-----	100	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Fa: Farnum-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.31
Fm: Farnum-----	100	Not limited		Not limited		Not limited	
Fn: Farnum-----	100	Not limited		Not limited		Not limited	
Fu: Farnum-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.31
Ge: Gerlane-----	100	Somewhat limited Flooding Filtering capacity	0.60 0.00	Very limited Flooding Filtering capacity	1.00 0.00	Somewhat limited Flooding Filtering capacity	0.60 0.00
Gn: Grant-----	100	Not limited		Not limited		Not limited	
Gr: Grant-----	100	Not limited		Not limited		Not limited	
GRP: Gravel Pits-----	100	Not rated		Not rated		Not rated	
Gs: Grant-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.31
INT: Aquolls-----	100	Very limited Depth to saturated zone Low adsorption Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Low adsorption Ponding	1.00 1.00 1.00	Very limited Depth to saturated zone Low adsorption Ponding	1.00 1.00 1.00
Ka: Kanza-----	100	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00	Very limited Flooding Depth to saturated zone	1.00 1.00

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper 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
Kk: Kaski-----	100	Filtering capacity	1.00	Filtering capacity	1.00	Filtering capacity	1.00
		Runoff limitation	0.40	Too acid	0.14	Too acid	0.14
		Too acid	0.03	Droughty	0.03	Droughty	0.03
Km: Kirkland-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
		Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Kr: Kirkland-----	70	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Renfrow-----	30	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00
Kw: Kirkland-----	70	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
		Renfrow-----	30	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00
Mc: Minco-----	100	Not limited		Not limited		Not limited	
Mn: Minco-----	100	Not limited		Not limited		Not limited	
Mo: Minco-----	100	Not limited		Not limited		Somewhat limited Too steep for surface application	0.31
Na: Nashville-----	100	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65
Ne: Nashville-----	100	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65
Nh: Nashville-----	100	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock	0.65	Somewhat limited Depth to bedrock Too steep for surface application	0.65 0.31
		Nn: Nashville-----	100	Somewhat limited Depth to bedrock	0.46	Somewhat limited Depth to bedrock Too steep for surface application	0.46 0.31
No: Norge-----	100	Somewhat limited Restricted permeability Too acid	0.30 0.03	Somewhat limited Restricted permeability Too acid	0.22 0.14	Somewhat limited Restricted permeability Too acid	0.22 0.14
		Pc: Pond Creek-----	100	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07
Pd: Pond Creek-----	100	Somewhat limited Restricted permeability Too acid	0.30 0.02	Somewhat limited Restricted permeability Too acid	0.22 0.07	Somewhat limited Restricted permeability Too acid	0.22 0.07
		Pe: Pond Creek-----	100	Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper 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		
Eg: Pond Creek-----	100	Too acid	0.02	Too acid	0.07	Restricted permeability Too acid	0.22 0.07		
		Somewhat limited Restricted permeability	0.30	Somewhat limited Restricted permeability	0.22	Somewhat limited Too steep for surface application	0.31		
		Too acid	0.02	Too acid	0.07	Restricted permeability Too acid	0.22 0.07		
Ph: Dale-----	100	Not limited		Somewhat limited Flooding	0.40	Not limited			
Pk: Port-----	100	Somewhat limited Salinity	0.01	Somewhat limited Flooding Salinity	0.40 0.13	Somewhat limited Salinity	0.13		
Pm: Pratt-----	100	Very limited Filtering capacity Leaching limitation	1.00 0.45	Very limited Filtering capacity	1.00	Very limited Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 0.66 0.00		
		Pn: Pratt-----	100	Very limited Filtering capacity Droughty Leaching limitation	1.00 0.94 0.45	Very limited Filtering capacity Droughty Depth to bedrock	1.00 0.94 0.42	Very limited Filtering capacity Droughty Too steep for surface application Depth to bedrock Too steep for sprinkler application	1.00 0.94 0.66 0.42 0.00
Po: Pratt-----	65			Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00	Very limited Depth to saturated zone	1.00
				Filtering capacity Leaching limitation	1.00 0.45	Filtering capacity	1.00	Filtering capacity Too steep for surface application Too steep for sprinkler application	1.00 0.66 0.00
Carwile-----	35	Very limited Depth to saturated zone Restricted permeability Runoff limitation Too acid	1.00 1.00 0.40 0.02	Very limited Depth to saturated zone Restricted permeability Too acid	1.00 1.00 0.07	Very limited Depth to saturated zone Restricted permeability Too acid	1.00 1.00 0.07		
Pt: Pratt-----	50	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Too steep for surface application	1.00		
		Slope	0.63	Slope	0.63	Filtering capacity	1.00		
		Leaching limitation	0.45			Too steep for sprinkler application	0.77		
Tivoli-----	50	Very limited Filtering capacity	1.00	Very limited Filtering capacity	1.00	Very limited Too steep for surface application	1.00		
		Droughty	0.99	Droughty	0.99	Filtering capacity	1.00		
		Slope	0.63	Slope	0.63	Droughty	0.99		

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper 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
Qa: Quinlan-----	100	Leaching limitation	0.45			Too steep for sprinkler application	0.77
		Very limited Depth to bedrock Droughty	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00
Qn: Quinlan-----	100	Very limited Depth to bedrock Droughty	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00
Qu: Quinlan-----	100	Very limited Depth to bedrock Droughty	1.00 1.00	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
Rc: Renfrow-----	65	Very limited Restricted permeability Runoff limitation	1.00 0.40	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Vernon-----	35	Very limited Restricted permeability Droughty Sodium content Runoff limitation Depth to bedrock	1.00 0.95 0.92 0.40 0.29	Very limited Restricted permeability Droughty Sodium content Depth to bedrock	1.00 0.95 0.92 0.29	Very limited Restricted permeability Droughty Sodium content Depth to bedrock	1.00 0.95 0.92 0.29
Re: Ruella-----	100	Very limited Depth to bedrock Droughty	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00
Rh: Ruella-----	100	Very limited Depth to bedrock Droughty	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00	Very limited Droughty Depth to bedrock	1.00 1.00
Ru: Ruella-----	100	Very limited Depth to bedrock Droughty	1.00 1.00	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
Sa: Lesho-----	100	Very limited Filtering capacity Flooding	1.00 0.60	Very limited Flooding Filtering capacity	1.00 1.00	Very limited Filtering capacity Flooding	1.00 0.60
		Salinity	0.50	Depth to saturated zone	0.43	Depth to saturated zone	0.43
		Depth to saturated zone	0.43	Restricted permeability	0.22	Restricted permeability	0.22
		Restricted permeability	0.30	Salinity	0.13	Salinity	0.13
Sb: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid	0.42
Se: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid	0.42
Sf: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid Too steep for surface application	0.42 0.31
Sg: Shellabarger-----	100	Somewhat limited Too acid	0.11	Somewhat limited Too acid	0.42	Somewhat limited Too acid Too steep for surface application	0.42 0.31
Sh: Zellmont-----	100	Somewhat limited		Somewhat limited		Somewhat limited	

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper County, Kansas

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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
SHH: Shellabarger-----	100	Restricted permeability	0.30	Too acid	0.31	Too acid	0.31
		Depth to bedrock	0.29	Depth to bedrock	0.29	Depth to bedrock	0.29
		Droughty	0.22	Restricted permeability	0.22	Restricted permeability	0.22
		Too acid	0.08	Droughty	0.22	Droughty	0.22
Sk: Zellmont-----	100	Somewhat limited	0.11	Somewhat limited	0.42	Somewhat limited	0.42
		Too acid	0.11	Too acid	0.42	Too acid	0.42
		Restricted permeability	0.30	Too acid	0.31	Too steep for surface application	0.31
Sm: Zellmont, eroded----	100	Depth to bedrock	0.29	Depth to bedrock	0.29	Too acid	0.31
		Droughty	0.22	Restricted permeability	0.22	Depth to bedrock	0.29
		Too acid	0.08	Droughty	0.22	Restricted permeability	0.22
		Too acid	0.08	Droughty	0.22	Droughty	0.22
Sn: Shellabarger-----	100	Somewhat limited	0.30	Somewhat limited	0.31	Somewhat limited	0.31
		Restricted permeability	0.30	Too acid	0.31	Too steep for surface application	0.31
		Depth to bedrock	0.29	Depth to bedrock	0.29	Too acid	0.31
		Droughty	0.22	Restricted permeability	0.22	Depth to bedrock	0.29
So: Shellabarger-----	70	Too acid	0.08	Droughty	0.22	Restricted permeability	0.22
		Somewhat limited	0.37	Somewhat limited	0.42	Very limited	1.00
		Slope	0.37	Too acid	0.42	Too steep for surface application	1.00
Sb: Albion-----	30	Too acid	0.11	Slope	0.37	Too steep for surface application	0.59
		Very limited	1.00	Very limited	1.00	Too steep for surface application	0.42
		Filtering capacity	1.00	Filtering capacity	1.00	Too acid	0.42
		Slope	0.37	Slope	0.37	Filtering capacity	1.00
Sp: Drummond-----	100	Too acid	0.03	Too acid	0.14	Too steep for surface application	0.59
		Droughty	0.00	Droughty	0.00	Too steep for sprinkler application	0.14
		Very limited	1.00	Very limited	1.00	Too acid	0.14
		Restricted permeability	1.00	Restricted permeability	1.00	Droughty	0.00
Ta: Tabler-----	100	Droughty	1.00	Droughty	1.00	Restricted permeability	1.00
		Salinity	0.50	Salinity	1.00	Droughty	1.00
		Depth to saturated zone	0.43	Depth to saturated zone	0.43	Salinity	1.00
		Runoff limitation	0.40	Runoff limitation	0.40	Depth to saturated zone	0.43
Th: Tivoli-----	100	Very limited	1.00	Very limited	1.00	Very limited	1.00
		Filtering capacity	1.00	Filtering capacity	1.00	Restricted permeability	1.00
		Filtering capacity	1.00	Filtering capacity	1.00	Depth to saturated zone	0.43

AGRICULTURAL WASTE MANAGEMENT--Continued
Harper County, Kansas

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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
Vr: Vernon-----	60	Droughty	1.00	Droughty	1.00	Filtering capacity	1.00
		Slope	0.63	Slope	0.63	Droughty	1.00
		Leaching limitation	0.45			Too steep for sprinkler application	0.77
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
Renfrow-----	40	Droughty	0.95	Droughty	0.95	Droughty	0.95
		Sodium content	0.92	Sodium content	0.92	Sodium content	0.92
		Runoff limitation	0.40			Too steep for surface application	0.08
		Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00	Very limited Restricted permeability	1.00
W: Water-----	100	Runoff limitation	0.40			Too steep for surface application	0.08
		Not rated		Not rated		Not rated	
Wa: Kingman-----	100	Not rated		Not rated		Not rated	
		Very limited Depth to saturated zone	1.00	Very limited Flooding	1.00	Very limited Depth to saturated zone	1.00
		Flooding	0.60	Depth to saturated zone	1.00	Flooding	0.60
		Runoff limitation	0.40	Restricted permeability	0.22	Restricted permeability	0.22
Wd: Quinlan-----	50	Restricted permeability	0.30				
		Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
Woodward-----	50	Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Somewhat limited Droughty	0.71	Somewhat limited Droughty	0.71	Somewhat limited Droughty	0.71
We: Quinlan-----	50	Depth to bedrock	0.42	Depth to bedrock	0.42	Depth to bedrock	0.42
		Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
Woodward-----	50	Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Somewhat limited Depth to bedrock	0.90	Somewhat limited Depth to bedrock	0.90	Somewhat limited Depth to bedrock	0.90
Ww: Quinlan-----	50	Droughty	0.71	Droughty	0.71	Droughty	0.71
		Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
Woodward-----	50	Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
Za: Canadian-----	100	Very limited Depth to bedrock	1.00	Very limited Droughty	1.00	Very limited Droughty	1.00
		Droughty	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
Woodward-----	50	Depth to bedrock	1.00	Depth to bedrock	1.00	Depth to bedrock	1.00
		Somewhat limited Droughty	0.71	Somewhat limited Droughty	0.71	Somewhat limited Droughty	0.71
Zf: Zenda-----	100	Depth to bedrock	0.42	Depth to bedrock	0.42	Depth to bedrock	0.42
		Somewhat limited Flooding	0.60	Somewhat limited Flooding	0.60	Somewhat limited Flooding	0.60
Canadian-----	100	Filtering capacity	0.00	Flooding	0.40	Flooding	0.40
		Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00	Somewhat limited Filtering capacity	0.00
Zenda-----	100	Somewhat limited Flooding	0.60	Very limited Flooding	1.00	Somewhat limited Flooding	0.60
		Depth to saturated zone	0.43	Depth to saturated zone	0.43	Depth to saturated zone	0.43

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

Soils Data Table: SOIL_KS Sort Order: MUSYM

Harper County, Kansas: KS077

MUSYM/SEQ#	COMPONENT/TEXTURE/MU%	HYD	KFACT	SURFACE DEPTH	% OM	SPISP II Ratings		
						Leaching (SLP)	Solution Runoff (SSRP)	Adsorbed Runoff (SARP)
007AE 1	ALBION SL 55%	B	0.20	8"	1.5%	H	I	I
007AE 2	SHELLABARGER SL 45%	B	0.20	14"	1.5%	I	I	I
007AS 1	CLAIREMONT SIL 100%	B	0.43	8"	1.0%	H	I	I
007FU 1	FARNUM CL 100%	B	0.28	9"	2.0%	I	I	I
007KA 1	KANZA LFS 100%	D	0.17	7"	2.0%	H (w)	H	H
095AD 1	ALBION SL 100%	B	0.20	8"	1.5%	H	I	I
095DA 1	DILLWYN LFS 60%	A	0.17	8"	1.0%	H (w)	L	L
095DA 2	PLEVNA FSL 40%	D	0.20	11"	2.5%	H (w)	H	H
095LA 1	LINCOLN LFS 100%	A	0.17	10"	0.5%	H	L	L
095NB 1	NASHVILLE SIL 60%	B	0.32	28"	3.0%	L	I	I
095NB 2	QUINLAN L 40%	C	0.37	13"	0.5%	L	H	H
095SA 1	SHELLABARGER LS 100%	B	0.20	12"	1.5%	I	I	I
095SC 1	SHELLABARGER SL 100%	B	0.20	10"	1.5%	H	I	I
095SD 1	SHELLABARGER SL 100%	B	0.20	10"	1.5%	H	I	I
095ZA 1	ZENDA CL 100%	C	0.28	13"	2.0%	H (w)	H	H
191CS 1	CRISFIELD SL 100%	B	0.20	16"	1.5%	I	I	I
191EA 1	ELANDCO SICL 100%	B	0.37	40"	2.0%	L	I	I
191EC 1	ELANDCO SIL 100%	B	0.43	40"	2.0%	L	I	I
191LS 1	LINCOLN LFS 100%	A	0.17	11"	0.5%	H	L	L
191OP 1	OWENS CL 65%	D	0.32	5"	1.3%	V	H	H (s)
191OP 2	ELANDCO SIL 35%	B	0.43	40"	2.0%	L	I	I
191PD 1	POND CREEK SICL 100%	B	0.32	12"	2.0%	I	I	I
191RA 1	RENFROW CL 70%	D	0.43	9"	2.0%	V	H	H
191RA 2	GRAINOLA SIL 30%	D	0.43	8"	0.8%	V	H	H
191TA 1	TABLER SICL 100%	D	0.43	10"	2.0%	V	H	H
191US 1	USTIFLUVENTS 100%		0.00	0"	0.0%	?	?	?
An 1	KASKI L 100%	B	0.28	26"	2.0%	L	I	I
At 1	ATTICA FSL 100%	B	0.24	10"	0.8%	H	I	I

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

Soils Data Table: SOIL_KS Sort Order: MUSYM

Harper County, Kansas: KS077

Be 1	BETHANY SIL 100%	C	0.43	13"	2.0% L	H	H
Bh 1	BETHANY SIL 100%	C	0.43	13"	2.0% L	H	H
Bm 1	LINCOLN LFS 100%	A	0.17	21"	0.5% H	L	L
Bo 1	GERLANE LFS 100%	A	0.17	4"	0.5% H	L	L
Bp 1	WOODWARD SIL 65%	B	0.37	24"	1.3% I	I	H (s)
Bp 2	PORT SIL 35%	B	0.37	27"	2.0% L	I	I
Br 1	BROKEN ALLUVIAL LAND SIL 100%	B	0.37	6"	1.3% H	I	H (s)
Ca 1	CARWILE FSL 100%	D	0.24	14"	2.0% H (w)	H	H
Cc 1	CASE CL 70%	B	0.32	7"	1.3% I	I	I
Cc 2	CLARK L 30%	B	0.28	8"	1.5% I	I	I
Ce 1	CORBIN SIL 100%	B	0.32	16"	2.0% I	I	I
Cf 1	CORBIN SIL 100%	B	0.32	16"	2.0% I	I	I
Ch 1	CRISFIELD FSL 100%	B	0.20	18"	1.5% I	I	I
CHR 1	CHIKASKIA RIVER S 100%	D	0.00	6"	0.1% H (w)	H	L
Fa 1	FARNUM CL 100%	B	0.28	7"	2.0% I	I	I
Fm 1	FARNUM L 100%	B	0.28	11"	2.0% I	I	I
Fn 1	FARNUM L 100%	B	0.28	11"	2.0% I	I	I
Fu 1	FARNUM L 100%	B	0.28	11"	2.0% I	I	I
Ge 1	GERLANE FSL 100%	B	0.20	17"	2.0% H (w)	I	I
Gn 1	GRANT SIL 100%	B	0.37	11"	2.0% I	I	I
Gr 1	GRANT SIL 100%	B	0.37	11"	2.0% I	I	I
GRP 1	GRAVEL PITS 100%		0.00	0"	0.0% ?	?	?
Gs 1	GRANT SIL 100%	B	0.37	11"	2.0% I	I	I
INT 1	AQUOLLS VAR 100%	C	0.00	60"	0.0% ?	H	?
Ka 1	KANZA LFS 100%	D	0.17	8"	2.0% H (w)	H	H
Kk 1	KASKI L 100%	B	0.28	19"	2.0% I	I	I
Km 1	KIRKLAND SIL 100%	D	0.49	12"	2.0% V	H	H
Kr 1	KIRKLAND CL 70%	D	0.43	12"	2.0% V	H	H
Kr 2	RENFROW CL 30%	D	0.43	9"	2.0% V	H	H
Kw 1	KIRKLAND CL 70%	D	0.43	6"	2.0% V	H	H

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

Soils Data Table: SOIL_KS Sort Order: MUSYM

Harper County, Kansas: KS077

Kw 2	RENFROW CL 30%	D	0.43	6"	2.0% V	H	H
Mc 1	MINCO SIL 100%	B	0.37	42"	2.0% L	I	I
Mn 1	MINCO SIL 100%	B	0.37	42"	2.0% L	I	I
Mo 1	MINCO SIL 100%	B	0.37	42"	2.0% L	I	I
Na 1	NASHVILLE SIL 100%	B	0.32	12"	3.0% I	I	I
Ne 1	NASHVILLE SIL 100%	B	0.32	12"	3.0% I	I	I
Nh 1	NASHVILLE SIL 100%	B	0.32	12"	3.0% I	I	I
Nn 1	NASHVILLE SIL 100%	B	0.32	7"	3.0% I	I	I
No 1	NORGE L 100%	B	0.28	10"	2.0% I	I	I
Pc 1	POND CREEK SIL 100%	B	0.37	13"	2.0% I	I	I
Pd 1	POND CREEK SIL 100%	B	0.37	13"	2.0% I	I	I
Pe 1	POND CREEK SIL 100%	B	0.37	13"	2.0% I	I	I
Pg 1	POND CREEK SIL 100%	B	0.37	8"	2.0% I	I	I
Ph 1	PORT SIL 100%	B	0.37	22"	2.0% I	I	I
Pk 1	PORT SIL 100%	B	0.32	22"	2.0% I	I	I
Pm 1	PRATT LFS 100%	A	0.17	12"	0.8% H	L	L
Pn 1	PRATT LFS 100%	A	0.17	12"	0.8% H	L	L
Po 1	PRATT LFS 65%	A	0.17	12"	0.8% H (w)	L	L
Po 2	CARWILE FSL 35%	D	0.24	14"	2.0% H (w)	H	H
Pt 1	PRATT LFS 50%	A	0.17	12"	0.8% H	L	L
Pt 2	TIVOLI LFS 50%	A	0.17	5"	0.5% H	L	L
Qa 1	QUINLAN L 100%	C	0.37	9"	0.5% L	H	H
Qn 1	QUINLAN L 100%	C	0.37	9"	0.5% L	H	H
Qu 1	QUINLAN L 100%	C	0.37	9"	0.5% L	H	H
Rc 1	RENFROW CL 65%	D	0.43	9"	2.0% V	H	H
Rc 2	VERNON CL 35%	D	0.37	7"	1.3% V	H	H
Re 1	RUELLA L 100%	B	0.32	9"	1.5% I	I	I
Rh 1	RUELLA L 100%	B	0.32	9"	1.5% I	I	I
Ru 1	RUELLA L 100%	B	0.32	9"	1.5% I	I	I
Sa 1	SALINE ALLUVIAL LAND CL 100%	C	0.28	18"	1.5% H (w)	H	H

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

Soils Data Table: SOIL_KS Sort Order: MUSYM

Harper County, Kansas: KS077

Sb 1	SHELLABARGER FSL 100%	B	0.20	13"	1.5%	I	I	I
Se 1	SHELLABARGER FSL 100%	B	0.20	13"	1.5%	I	I	I
Sf 1	SHELLABARGER FSL 100%	B	0.20	13"	1.5%	I	I	I
Sg 1	SHELLABARGER FSL 100%	B	0.20	13"	1.5%	I	I	I
Sh 1	SHELLABARGER FSL 100%	B	0.24	13"	2.0%	I	I	I
SHH 1	SHELLABARGER SL 100%	B	0.20	10"	1.5%	H	I	I
Sk 1	SHELLABARGER FSL 100%	B	0.24	13"	2.0%	I	I	I
Sm 1	SHELLABARGER FSL 100%	B	0.24	7"	2.0%	H	I	I
Sn 1	SHELLABARGER LFS 100%	B	0.20	13"	1.5%	I	I	I
So 1	SHELLABARGER FSL 70%	B	0.20	13"	1.5%	I	I	I
So 2	ALBION SL 30%	B	0.20	6"	1.5%	H	I	I
Sp 1	DRUMMOND L 100%	D	0.49	8"	0.8%	H (w)	H	H
Ta 1	TABLER CL 100%	D	0.43	10"	2.0%	V	H	H
Th 1	TIVOLI FS 100%	A	0.17	5"	0.5%	H	L	L
Vr 1	VERNON CL 60%	D	0.37	7"	1.3%	V	H	H
Vr 2	RENFROW CL 40%	D	0.43	7"	2.0%	V	H	H
W 1	WATER 100%		0.00	0"	0.0%	?	?	?
Wa 1	WT ALLUVIAL LAND CL 100%	D	0.32	10"	3.0%	H (w)	H	H
Wd 1	QUINLAN L 50%	C	0.37	9"	0.5%	L	H	H
Wd 2	WOODWARD L 50%	B	0.37	24"	1.3%	I	I	I
We 1	QUINLAN L 50%	C	0.37	9"	0.5%	L	H	H
We 2	WOODWARD L 50%	B	0.37	24"	1.3%	I	I	I
Ww 1	QUINLAN L 50%	C	0.37	9"	0.5%	L	H	H
Ww 2	WOODWARD L 50%	B	0.37	24"	1.3%	I	I	I
Za 1	CANADIAN FSL 100%	B	0.20	21"	2.0%	I	I	I
Zf 1	ZENDA FSL 100%	C	0.28	15"	1.5%	H (w)	H	H

(.\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

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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.

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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
007AE: ALBION AND SHELLABARGER SOILS, 4 TO 15 PERCENT SLOPES	ALBION	No	paleoterrace	---	---	---	---
	SHELLABARGER Unnamed wet soils	No Yes	paleoterrace drainageway	---	---	---	---
007AS: CLAIREMONT SOILS, SALINE, CHANNELED	CLAIREMONT	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	depression	2A, 2B3, 4	YES	YES	NO
007FU: FARNUM CLAY LOAM, 1 TO 3 PERCENT SLOPES, ERODED	FARNUM	No	paleoterrace	---	---	---	---
007KA: KANZA SOILS, FREQUENTLY FLOODED	KANZA	Yes	flood plain	2B3	YES	NO	NO
095AD: ALBION SANDY LOAM, 6 TO 15 PERCENT SLOPES	ALBION	No	paleoterrace	---	---	---	---
	DILLWYN	No	interdune, dune, paleoterrace	---	---	---	---
095DA: DILLWYN-PLEVNA COMPLEX, OCCASIONALLY FLOODED	PLEVNA Unnamed wet soils	Yes Yes	flood plain depression	2B3, 4 2A, 2B3, 3	YES YES	YES NO	NO YES
	LINCOLN	No	flood plain	---	---	---	---
095LA: LINCOLN LOAMY SAND, OCCASIONALLY FLOODED	Unnamed wet soils	Yes	drainageway	2A, 2B3, 2B2	YES	NO	NO
	NASHVILLE	No	hillslope	---	---	---	---
095NB: NASHVILLE-QUINLAN COMPLEX, 5 TO 15 PERCENT SLOPES	QUINLAN Unnamed wet soils	No Yes	hillslope depression	---	---	---	---
	2A, 2B3, 4	YES	YES	NO	---		
095SA: SHELLABARGER LOAMY SAND, 0 TO 3 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
095SC: SHELLABARGER SANDY LOAM, 3 TO 6 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
095SD: SHELLABARGER SANDY LOAM, 3 TO 6 PERCENT SLOPES, ERODED	SHELLABARGER	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A, 2B3	YES	NO	NO
095ZA: ZENDA CLAY LOAM, OCCASIONALLY FLOODED	ZENDA	No	dune, paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A, 3, 2B3	YES	NO	YES
191EA: ELANDCO SILTY CLAY LOAM, RARELY FLOODED	ELANDCO	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	depression	2B3, 3, 4	YES	YES	YES
191EC: ELANDCO SILT LOAM, FREQUENTLY FLOODED	ELANDCO	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2B3, 4, 3	YES	YES	YES
191LS: LINCOLN SOILS, FREQUENTLY FLOODED	LINCOLN	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A, 2B3, 2B2	YES	NO	NO
191OP: WELLSFORD-ELANDCO COMPLEX, 0 TO 25 PERCENT SLOPES	WELLSFORD	No	hillslope	---	---	---	---
	ELANDCO	No	flood plain	---	---	---	---
191PD: POND CREEK SILTY CLAY LOAM, 2 TO 6 PERCENT SLOPES, ERODED	POND CREEK	No	terrace	---	---	---	---

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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
191RA: RENFROW-GRAINOLA COMPLEX, 1 TO 3 PERCENT SLOPES	RENFROW	No	hillslope	---	---	---	---
	GRAINOLA	No	hillslope	---	---	---	---
191TA: TABLER SILTY CLAY LOAM, 0 TO 1 PERCENT SLOPES	TABLER	No	paleoterrace	---	---	---	---
	USTIFLUVENTS, CHANNELED	No	flood plain	---	---	---	---
191US: USTIFLUVENTS, CHANNELED	USTIFLUVENTS	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2B3, 2A, 4, 2B ₂	YES	YES	NO
1439: CRISFIELD SANDY LOAM, RARELY FLOODED	CRISFIELD	No	terrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A, 2B3	YES	NO	NO
An: KASKI LOAM, FREQUENTLY FLOODED	KASKI	Unranked	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A, 2B3	YES	NO	NO
At: ATTICA FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES	ATTICA	No	dune, paleoterrace	---	---	---	---
Be: BETHANY SILT LOAM, 0 TO 1 PERCENT SLOPES	BETHANY	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A, 3, 2B3	YES	NO	YES
Bh: BETHANY SILT LOAM, 1 TO 3 PERCENT SLOPES	BETHANY	No	paleoterrace	---	---	---	---
Bm: LINCOLN LOAMY FINE SAND, OCCASIONALLY FLOODED	LINCOLN	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A, 2B2	YES	NO	NO
Bo: GERLANE VARIANT LOAMY FINE SAND, OCCASIONALLY FLOODED	GERLANE	No	terrace	---	---	---	---
Bp: WOODWARD-PORT COMPLEX, 0 TO 20 PERCENT SLOPES	WOODWARD	No	hillslope	---	---	---	---
	PORT Unnamed wet soils	Unranked Yes	terrace depression	--- 3, 2B3, 2A, 4	--- YES	--- YES	--- YES
Br: FLUVENTS, FREQUENTLY FLOODED	BROKEN ALLUVIAL LAND	Unranked	flood plain	---	---	---	---
Ca: CARWILE FINE SANDY LOAM, 0 TO 1 PERCENT SLOPES	CARWILE	Yes	depression, paleoterrace	2A	YES	NO	NO
	Unnamed wet soils	Yes	depression	2A, 3, 2B3	YES	NO	YES
Cc: CASE-CLARK COMPLEX, 2 TO 6 PERCENT SLOPES	CASE	No	paleoterrace	---	---	---	---
	CLARK	No	paleoterrace	---	---	---	---
Ce: CORBIN SILT LOAM, 0 TO 1 PERCENT SLOPES	CORBIN	No	hillslope	---	---	---	---
Cf: CORBIN SILT LOAM, 1 TO 3 PERCENT SLOPES	CORBIN	No	hillslope	---	---	---	---
Fa: FARNUM CLAY LOAM, 3 TO 6 PERCENT SLOPES, ERODED	FARNUM	No	paleoterrace	---	---	---	---
Fm: FARNUM LOAM, 0 TO 1 PERCENT SLOPES	FARNUM	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A, 3, 2B3	YES	NO	YES

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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
Fn: FARNUM LOAM, 1 TO 3 PERCENT SLOPES	FARNUM	No	paleoterrace	---	---	---	---
Fu: FARNUM LOAM, 3 TO 6 PERCENT SLOPES	FARNUM	No	paleoterrace	---	---	---	---
Ge: GERLANE FINE SANDY LOAM, OCCASIONALLY FLOODED	GERLANE	No	terrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO
Gn: GRANT SILT LOAM, 0 TO 1 PERCENT SLOPES	GRANT	No	terrace	---	---	---	---
Gr: GRANT SILT LOAM, 1 TO 3 PERCENT SLOPES	GRANT	No	terrace	---	---	---	---
GRP: GRAVEL PITS	GRAVEL PITS	Unranked	---	---	---	---	---
Gs: GRANT SILT LOAM, 3 TO 6 PERCENT SLOPES	GRANT	No	terrace	---	---	---	---
INT: AQUOLLS	AQUOLLS	Yes	depression, terrace	3,2B3	YES	NO	YES
Ka: KANZA LOAMY FINE SAND, FREQUENTLY FLOODED	KANZA	Yes	flood plain	2B3	YES	NO	NO
	Unnamed wet soils	Yes	drainageway	2A,2B3	YES	NO	NO
Kk: KASKI LOAM, OCCASIONALLY FLOODED	KASKI	No	flood plain	---	---	---	---
	WET ALLUVIAL LAND	Yes	depression	2B2	YES	NO	NO
Km: KIRKLAND SILT LOAM, 0 TO 1 PERCENT SLOPES	KIRKLAND	No	hillslope	---	---	---	---
Kr: KIRKLAND-RENFROW CLAY LOAMS, 1 TO 3 PERCENT SLOPES	KIRKLAND	No	hillslope	---	---	---	---
	RENFROW	No	hillslope	---	---	---	---
Kw: KIRKLAND-RENFROW SOILS, 1 TO 3 PERCENT SLOPES, ERODED	KIRKLAND	No	hillslope	---	---	---	---
	RENFROW	No	hillslope	---	---	---	---
Mc: MINCO SILT LOAM, 0 TO 1 PERCENT SLOPES	MINCO	No	hillslope	---	---	---	---
Mn: MINCO SILT LOAM, 1 TO 3 PERCENT SLOPES	MINCO	No	hillslope	---	---	---	---
Mo: MINCO SILT LOAM, 3 TO 6 PERCENT SLOPES	MINCO	No	hillslope	---	---	---	---
Na: NASHVILLE SILT LOAM, 0 TO 1 PERCENT SLOPES	NASHVILLE	No	hillslope	---	---	---	---
Ne: NASHVILLE SILT LOAM, 1 TO 3 PERCENT SLOPES	NASHVILLE	No	hillslope	---	---	---	---
Nh: NASHVILLE SILT LOAM, 3 TO 6 PERCENT SLOPES	NASHVILLE	No	hillslope	---	---	---	---
Nn: NASHVILLE SILT LOAM, 3 TO 6 PERCENT SLOPES, ERODED	NASHVILLE	No	hillslope	---	---	---	---
No: MILAN LOAM, 1 TO 3 PERCENT SLOPES	NORGE	No	hillslope	---	---	---	---
Pc: POND CREEK SILT LOAM, 0 TO 1 PERCENT SLOPES	POND CREEK	No	terrace	---	---	---	---
Pd: POND CREEK SILT LOAM, 1 TO 3 PERCENT SLOPES	POND CREEK	No	terrace	---	---	---	---
Pe: POND CREEK SILT LOAM, 3 TO 6 PERCENT SLOPES	POND CREEK	No	terrace	---	---	---	---

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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
Pg: POND CREEK SILT LOAM, 3 TO 6 PERCENT SLOPES, ERODED	POND CREEK	No	terrace	---	---	---	---
Ph: DALE SILT LOAM, RARELY FLOODED	DALE	No	terrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A,3,2B3,4	YES	YES	YES
Pk: BUTTERMILK SILT LOAM, RARELY FLOODED	PORT	No	terrace	---	---	---	---
	SLICKSPOTS Unnamed wet soils	No Yes	--- depression	--- 2A,3,2B3,4	--- YES	--- YES	--- YES
Pm: PRATT LOAMY FINE SAND, 3 TO 8 PERCENT SLOPES	PRATT	No	dune, paleoterrace	---	---	---	---
	CARWILE	Yes	depression, paleoterrace	2A	YES	NO	NO
	Unnamed wet soils	Yes	depression	2A,2B3,3	YES	NO	YES
Pn: PRATT LOAMY FINE SAND, SILTSTONE SUBSTRATUM, 3 TO 8 PERCENT SLOPES	PRATT	No	dune, paleoterrace	---	---	---	---
	CARWILE	Yes	depression, paleoterrace	2A	YES	NO	NO
	Unnamed wet soils	Yes	depression	2A,2B3,3	YES	NO	YES
Po: PRATT-CARWILE COMPLEX, 0 TO 8 PERCENT SLOPES	PRATT	No	dune, paleoterrace	---	---	---	---
	CARWILE	Yes	depression, paleoterrace	2A	YES	NO	NO
	Unnamed wet soils	Yes	depression	2A,2B3,3	YES	NO	YES
Pt: PRATT-TIVOLI LOAMY FINE SANDS, 8 TO 15 PERCENT SLOPES	PRATT	No	dune, paleoterrace	---	---	---	---
	TIVOLI	No	dune, paleoterrace	---	---	---	---
	CARWILE	Yes	depression, paleoterrace	2A,3	YES	NO	YES
	Unnamed wet soils	Yes	depression	2A,2B3,2B2	YES	NO	NO
Qa: QUINLAN LOAM, 0 TO 1 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
Qn: QUINLAN LOAM, 1 TO 3 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
Qu: QUINLAN LOAM, 3 TO 6 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
Rc: RENFROW-VERNON CLAY LOAMS, 1 TO 3 PERCENT SLOPES	RENFROW	No	hillslope	---	---	---	---
	VERNON	No	hillslope	---	---	---	---
Re: RUELLA LOAM, 0 TO 1 PERCENT SLOPES	RUELLA	No	hillslope	---	---	---	---
Rh: RUELLA LOAM, 1 TO 3 PERCENT SLOPES	RUELLA	No	hillslope	---	---	---	---
Ru: RUELLA LOAM, 3 TO 6 PERCENT SLOPES	RUELLA	No	hillslope	---	---	---	---
Sa: LESHO CLAY LOAM, SALINE, OCCASIONALLY FLOODED	LESHO	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	depression	2A,2B3	YES	NO	NO
Sb: SHELLABARGER FINE SANDY LOAM, 0 TO 1 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
Se: SHELLABARGER FINE SANDY LOAM, 1 TO 3 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---

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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
Sf: SHELLABARGER FINE SANDY LOAM, 3 TO 6 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO
Sg: SHELLABARGER FINE SANDY LOAM, 3 TO 6 PERCENT SLOPES, ERODED	SHELLABARGER	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO
Sh: ZELLMONT SANDY LOAM, 1 TO 3 PERCENT SLOPES	ZELLMONT	No	strath terrace	---	---	---	---
SHH: SHELLABARGER SANDY LOAM, 1 TO 3 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
Sk: ZELLMONT SANDY LOAM, 3 TO 6 PERCENT SLOPES	ZELLMONT	No	strath terrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO
Sm: ZELLMONT SANDY LOAM, 3 TO 6 PERCENT SLOPES, ERODED	ZELLMONT	No	strath terrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO
Sn: SHELLABARGER LOAMY FINE SAND, 0 TO 3 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
So: SHELLABARGER AND ALBION SOILS, 7 TO 15 PERCENT SLOPES	SHELLABARGER	No	paleoterrace	---	---	---	---
	ALBION Unnamed wet soils	No Yes	paleoterrace drainageway	---	---	---	---
Sp: DRUMMOND LOAM, 0 TO 2 PERCENT SLOPES	DRUMMOND	No	terrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A,3,2B3	YES	NO	YES
Ta: TABLER CLAY LOAM, 0 TO 1 PERCENT SLOPES	TABLER	No	paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	depression	2A,3,2B3	YES	NO	YES
Th: TIVOLI FINE SAND, 8 TO 15 PERCENT SLOPES	TIVOLI	No	dune, paleoterrace	---	---	---	---
Vr: VERNON-RENFROW COMPLEX, 2 TO 6 PERCENT SLOPES, ERODED	VERNON	No	hillslope	---	---	---	---
	RENFROW	No	hillslope	---	---	---	---
W: WATER	WATER	Unranked	---	---	---	---	
Wa: KINGMAN CLAY LOAM, OCCASIONALLY FLOODED	KINGMAN	Yes	flood plain	2B2	YES	NO	NO
Wd: WOODWARD-QUINLAN LOAMS, 0 TO 1 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
	WOODWARD	No	hillslope	---	---	---	---
We: WOODWARD-QUINLAN LOAMS, 1 TO 3 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
	WOODWARD Unnamed wet soils	No Yes	hillslope drainageway	---	---	---	---

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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
Ww: WOODWARD-QUINLAN LOAMS, 3 TO 6 PERCENT SLOPES	QUINLAN	No	hillslope	---	---	---	---
	WOODWARD Unnamed wet soils	No Yes	hillslope drainageway	--- 2A,2B3	--- YES	--- NO	--- NO
Za: CANADIAN FINE SANDY LOAM, RARELY FLOODED	CANADIAN	No	flood plain	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2B2,2A,2B3	YES	NO	NO
Zf: ZENDA FINE SANDY LOAM, OCCASIONALLY FLOODED	ZENDA	No	dune, paleoterrace	---	---	---	---
	Unnamed wet soils	Yes	drainageway	2A,2B3,2B2	YES	NO	NO

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.