

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
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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

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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
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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
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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
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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
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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
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
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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
		Seepage	1.00	Seepage	0.39	Deep to water	1.00
191OP: Wellsford-----	65	Very limited Seepage Depth to bedrock Slope	1.00 0.66 0.02	Very limited Thin layer Hard to pack	1.00 0.50	Very limited Deep to water	1.00
Elandco-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.81	Very limited Deep to water	1.00
191PD: Pond Creek-----	100	Somewhat limited Seepage	0.05	Somewhat limited Piping	0.67	Very limited Deep to water	1.00
191RA: Renfrow-----	70	Not limited		Somewhat limited Hard to pack	0.19	Very limited Deep to water	1.00
Grainola-----	30	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
191TA: Tabler-----	100	Not limited		Somewhat limited Depth to saturated zone Hard to pack	0.43 0.16	Very limited Deep to water	1.00
191US: Ustifluvents-----	100	Very limited Seepage Slope	1.00 0.03	Very limited Hard to pack	1.00	Very limited Deep to water	1.00
1439: Crisfield-----	100	Very limited Seepage	1.00	Somewhat limited Seepage Depth to saturated zone	0.78 0.18	Very limited Cutbanks cave Deep to water	1.00 0.44
An: Kaski-----	100	Somewhat limited Seepage	0.70	Somewhat limited Piping Seepage	0.78 0.09	Very limited Deep to water	1.00
At: Attica-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.09	Very limited Deep to water	1.00
Be: Bethany-----	100	Not limited		Not limited		Very limited Deep to water	1.00
Bh: Bethany-----	100	Not limited		Not limited		Very limited Deep to water	1.00
Bm: Lincoln-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.39	Very limited Deep to water	1.00
Bo: Gerlane-----	100	Very limited Seepage	1.00	Somewhat limited Seepage	0.22	Very limited Deep to water	1.00
Bp: Woodward-----	65	Somewhat limited Seepage Depth to bedrock Slope	0.70 0.11 0.00	Very limited Piping Thin layer	1.00 0.85	Very limited Deep to water	1.00
Port-----	35	Somewhat limited Seepage	0.70	Somewhat limited Piping	0.82	Very limited Deep to water	1.00
Br: Broken Alluvial Land	100	Somewhat limited Seepage Slope	0.70 0.03	Somewhat limited Piping	0.88	Very limited Deep to water	1.00

WATER MANAGEMENT--Continued
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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
Ca: Carwile-----	100	Somewhat limited Seepage	0.57	Very limited Depth to saturated zone Seepage	1.00 0.07	Somewhat limited Slow refill Cutbanks cave	0.30 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

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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
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

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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
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

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

