
KANSAS SURFACE WATER QUALITY STANDARDS

Tables of Numeric Criteria



Prepared by The Kansas Department of Health and Environment

Bureau of Water

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Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
RADIONUCLIDES (pCi/L)							
beta / photon emitters	a	a	a	a	a	a	50
gross alpha particles including radium-226, but not radon or uranium	a	a	a	a	a	a	15
radium 226 and 228 combined	a	a	a	a	a	a	5
strontium 90	a	a	a	a	a	a	8
tritium	a	a	a	a	a	a	20,000
METALS (µg/L)							
antimony, total	7440360	88	30	a	a	640	6
arsenic, total	7440382	340	150	200	100	20.5	10
arsenic (III)	a	360	50	a	a	0.14	0.018
arsenic (V)	a	850	48	a	a	a	a
barium, total	7440393	a	a	a	a	a	2,000
beryllium, total	7440417	a	a	a	a	a	4
boron, total	7440428	a	a	5,000	750	a	a
cadmium, total	7440439	table 1b	table 1b	20	10	170	5
chromium, total	7440473	a	40	1,000	100	a	100
chromium (III)	16065831	table 1b	table 1b	a	a	3,433,000	50
chromium (VI)	18540299	16	11	a	a	3,400	50
copper, total	7440508	BLM ^d	BLM ^d	500	200	a	1,000
lead, total	7439921	table 1b	table 1b	100	5,000	a	15
mercury, total	7439976	1.4	0.77	10	a	0.146	2
nickel, total	7440020	table 1b	table 1b	500	200	4,600	610
selenium, total	7782492	20	5	50	20	4,200	50
selenium (V)	a	11.2	a	a	a	a	a
silver, total	7440224	table 1b	a	a	a	a	100
thallium, total	7440280	1,400	40	a	a	6.3 ^b	2
zinc, total	7440666	table 1b	table 1b	25,000	2,000	26,000	5,000
OTHER INORGANIC SUBSTANCES (µg/L)							
ammonia	7664417	table 1c	table 1c	a	a	a	a
asbestos (fibers>10µm) (million-fibers/L)	12001295	a	a	a	a	a	7
chloride	16887006	860,000	c	a	a	a	250,000
chlorine, total residual	7782505	19	11	a	a	a	a
cyanide (free)	57125	22	5.2	a	a	220,000	200
fluoride	16984488	a	a	2,000	1,000	a	2,000
nitrate (as N)	14797558	a	a	a	a	a	10,000
nitrite + nitrate (as N)	a	a	a	100,000	a	a	10,000
sulfate	14808798	a	a	1,000,000	a	a	250,000

Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
ORGANIC SUBSTANCES (µg/L) (EXCEPT PESTICIDES)							
A. Halogenated Ethers.....							
chloroalkyl ethers, total	a	238,000	a	a	a	a	a
bis(2-chloroethyl) ether	111444	238,000	a	a	a	0.53	0.03
2-chloroethyl vinyl ether	110758	360	120	a	a	a	a
bis(2-chloroisopropyl) ether	108601	238,000	a	a	a	65,000	1400
bis(chloromethyl) ether	542881	238,000	a	a	a	0.00029	0.0001
chloromethyl methyl ether	107302	238,000	a	a	a	0.00184	a
4,4-dibromodiphenyl ether	2050477	360	120	a	a	a	a
halogenated ethers, total	a	360	122	a	a	a	a
hexabromodiphenyl ether	36483600	360	120	a	a	a	a
nonabromodiphenyl ether	63936561	360	120	a	a	a	a
pentabromodiphenyl ether	32534819	360	120	a	a	a	a
tetrabromodiphenyl ether	40088479	360	120	a	a	a	a
tribromodiphenyl ether	49690940	360	120	a	a	a	a
B. Halogenated Aliphatic Hydrocarbons.....							
Chlorinated ethanes							
1,2-dichloroethane	107062	18,000	2,000	a	a	99 ^b	0.38 ^b
hexachloroethane	67721	980	540	a	a	3.3	1.9 ^b
pentachloroethane	76017	7,240	1,100	a	a	a	a
1,1,1,2-tetrachloroethane	630206	9,320	a	a	a	a	a
1,1,2,2-tetrachloroethane	79345	9,320	2,400	a	a	4	0.17
tetrachloroethanes, total	a	9,320	a	a	a	a	a
1,1,1-trichloroethane	71556	18,000	a	a	a	173,077	200
1,1,2-trichloroethane	79005	18,000	9,400	a	a	16	0.6 ^b
Chlorinated ethenes							
chlorinated ethylenes, total	a	11,600	a	a	a	a	a
chloroethylene (vinyl chloride)	75014	a	a	a	a	2.4	2
1,1-dichloroethylene	75354	11,600	a	a	a	7,100	7
cis-1,2-dichloroethylene	156592	11,600	a	a	a	a	70
trans-1,2-dichloroethylene	156605	11,600	a	a	a	10,000	100
tetrachloroethylene (PCE)	127184	5,280	840	a	a	3.3	0.8 ^b
trichloroethylene (TCE)	79016	45,000	21,900	a	a	30	2.7 ^b
Chlorinated propanes/propenes							
1,2-dichloropropane	78875	23,000	5,700	9	a	15	5
1,3-dichloropropene	542756	6,060	244	a	a	14.1	10 ^b
Halogenated methanes							
bromochloromethane	74975	11,000	a	a	a	15.7	a
bromodichloromethane (dichlorobromomethane)	75274	11,000	a	a	a	17	0.55
bromotrichloromethane	75627	11,000	a	a	a	15.7	a
bis(2-chloroethoxy)methane	111911	11,000	a	a	a	15.7	a

Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
dibromochloromethane (chlorodibromomethane)	124481	11,000	a	a	a	13	0.4
dibromodichloromethane	594183	11,000	a	a	a	15.7	a
dichlorodifluoromethane	75718	11,000	a	a	a	15.7	a
dichloromethane (methylene chloride)	75092	11,000	a	a	a	590	5
halogenated methanes, total	a	11,000	a	a	a	15.7	100
tetrachloromethane (carbon tetrachloride)	56235	35,200	a	a	a	4.4 ^b	0.25 ^b
tribromochloromethane	594150	11,000	a	a	a	15.7	a
tribromomethane (bromoform)	75252	11,000	a	a	a	140	4.3
trichlorofluoromethane	75694	11,000	a	a	a	15.7	a
trichloromethane (chloroform)	67663	28,900	1,240	a	a	470	5.7
Other halogenated aliphatic hydrocarbons							
hexachlorobutadiene	87683	90	9.3	a	a	18	0.44
hexachlorocyclopentadiene	77474	7	5.2	a	a	1,100	50
C. Monocyclic Aromatic Hydrocarbons except Phenols and Phthalates.....							
<i>Benzenes</i>							
aminobenzene (aniline)	62533	14	6.7	a	a	a	a
benzene	71432	5,300	a	a	a	51	1.2 ^b
ethylbenzene	100414	32,000	a	a	a	2,100	700
nitrobenzene	98953	27,000	a	a	a	690	17
vinylbenzene (styrene)	100425	a	a	a	a	a	100
<i>Chlorinated benzenes</i>							
chlorobenzene	108907	250	50	a	a	1,600	100
dichlorobenzenes, total	25321226	1,120	763	a	a	2,600	a
1,2-dichlorobenzene (o-dichlorobenzene)	95501	1,120	763	a	a	1,300	600
1,3-dichlorobenzene (m-dichlorobenzene)	541731	1,120	763	a	a	960	400 ^b
1,4-dichlorobenzene (p-dichlorobenzene)	106467	a	a	a	a	190	75
hexachlorobenzene	118741	6	3.7	a	a	0.00029	0.00075 ^b
other chlorinated benzenes, total	a	250	50	a	a	a	a
pentachlorobenzene	608935	250	50	a	a	1.5	1.4
1,2,4,5-tetrachlorobenzene	95943	250	50	a	a	1.1	0.97
1,2,4-trichlorobenzene	120821	250	a	a	a	70	70
<i>Toluenes and xylenes</i>							
2,4-dinitrotoluene	121142	330	230	a	a	3.4	0.11
dinitrotoluenes, total	25321146	330	230	a	a	9.1	a
toluene	108883	17,500	a	a	a	15,000	1,000
xylenes, total	1330207	a	a	a	a	a	10,000

Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
D. Nitrogen Compounds Except Monocyclic Aromatics.....							
acrylonitrile	107131	7,550	2,600	a	a	0.25	0.059 ^b
benzidine	92875	2,500	a	a	a	0.0002	0.00012 ^b
3,3-dichlorobenzidine	91941	a	a	a	a	0.028	0.04 ^b
1,2-diphenylhydrazine	122667	270	a	a	a	0.2	0.04 ^b
nitrosamines, total	a	5,850	a	a	a	1.24	0.0008
N-nitrosodibutylamine	924163	5,850	a	a	a	0.22	0.0063
N-nitrosodiethanolamine	1116547	5,850	a	a	a	1.24	a
N-nitrosodiethylamine	55185	5,850	a	a	a	1.24	0.0008
N-nitrosodimethylamine	62759	5,850	a	a	a	3	0.00069
N-nitrosodiphenylamine	86306	5,850	a	a	a	6	5 ^b
N-nitrosodi-n-propylamine	621647	a	a	a	a	0.51	0.005
N-nitrosopyrrolidine	930552	5,850	a	a	a	34	0.016
E. Phenolic Compounds.....							
2,4-dimethyl phenol	105679	1,300	530	a	a	850	380
2,4-dinitrophenol	51285	a	a	a	a	5,300	69
nitrophenols, total	a	230	150	a	a	a	a
phenol	108952	10,200	2,560	a	a	860,000	10,000
Chlorinated phenols							
2-chlorophenol	95578	4,380	2,000	a	a	150	81
3-chlorophenol	108430	a	a	a	a	29,000	a
2,4-dichlorophenol	120832	2,020	365	a	a	790 ^b	93 ^b
3-methyl-4-chlorophenol	59507	30	a	a	a	a	a
2,4,5-trichlorophenol	95954	100	63	a	a	3,600	1,800
2,4,6-trichlorophenol	88062	a	970	a	a	2.4	2.1 ^b
F. Phthalate Esters							
butylbenzyl phthalate	85687	a	a	a	a	1,900	1,500
dibutyl phthalate (di-n-butyl phthalate)	84742	940	3	a	a	4,500	2,000
diethyl phthalate	84662	a	a	a	a	44,000	17,000
dimethyl phthalate	131113	940	3	a	a	1,100,000	270,000
bis(2-ethylhexyl) phthalate (DEHP)	117817	400	360	a	a	5.9 ^b	1.8 ^b
phthalates, total	a	940	3	a	a	a	a
G. Polynuclear Aromatic Hydrocarbons (PAHs).....							
acenaphthene	83329	1,700	520	a	a	990	670
acenaphthylene	208968	a	a	a	a	0.0311	a
anthracene	120127	a	a	a	a	40,000	9,600 ^b
benzo(a)anthracene	56553	a	a	a	a	0.018	0.0038
benzo(a)pyrene	50328	a	a	a	a	0.018	0.0028 ^b
benzo(b)fluoranthene	205992	a	a	a	a	0.018	0.0038
benzo(g,h,i)perylene	191242	a	a	a	a	0.0311	a
benzo(k)fluoranthene	207089	a	a	a	a	0.018	0.0038
2-chloronaphthalene	91587	a	a	a	a	1,600	1,000

Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
chrysene	218019	a	a	a	a	0.018	0.0038
dibenzo(a,h)anthracene	53703	a	a	a	a	0.018	0.0038
fluoranthene	206440	3,980	a	a	a	370 ^b	300 ^b
fluorene	86737	a	a	a	a	5,300	1,300 ^b
indeno(1,2,3-cd)pyrene	193395	a	a	a	a	0.018	0.0038
naphthalene	91203	2,300	620	a	a	a	a
phenanthrene	85018	30	6.3	a	a	0.0311	a
pyrene	129000	a	a	a	a	4,000	960 ^b
Polynuclear Aromatic Hydrocarbons, total (PAHs)	a	a	a	a	a	0.0311	0.2
H. Other Organics (Except Pesticides).....							
di(2-ethylhexyl) adipate	103231	a	a	a	a	a	400
isophorone	78591	117,000	a	a	a	960	35
polychlorinated biphenyls, total (PCBs)	a	2	0.014	a	a	0.000064	0.00017 ^b
2,3,7,8-TCDD (dioxin)	1746016	0.01	0.00001	a	a	5.00E-09	1.3E-8 ^b
PESTICIDES (µg/L)							
acrolein	107028	68	21	a	a	290	190
acrylamide	79061	a	a	a	a	a	0.01
alachlor (Lasso)	15972608	760	76	100	a	a	2
aldicarb	116063	a	a	a	a	a	3
aldicarb sulfone	1646884	a	a	a	a	a	2
aldicarb sulfoxide	1646873	a	a	a	a	a	3
aldrin	309002	3	0.001	1	a	0.00005	0.00013 ^b
atrazine (Aatrex)	1912249	170	3	a	a	a	3
bromomethane (methyl bromide)	74839	11,000	a	a	a	1,500	47
bromoxynil (MCPA)	1689845	a	a	20	a	a	a
carbaryl (Sevin)	63252	a	0.02	100	a	a	a
carbofuran (Furadan)	1563662	a	a	100	a	a	40
chlordane	57749	2.4	0.0043	3	a	0.00081	0.00057 ^b
chlorpyrifos	2921882	0.083	0.041	100	a	a	a
2,4-D	94757	a	a	a	a	a	70
dacthal (DCPA)	1861321	a	14,300	a	a	a	a
dalapon	75990	a	110	a	a	a	200
4,4-DDD (p,p=DDD)	72548	a	a	a	a	0.00031	0.00031
4,4-DDE (p,p=DDE)	72559	1,050	a	a	a	0.00022	0.00022
DDT, total	50293	1.1	0.001	50	a	0.00022	0.00022
diazinon (spectracide)	333415	0.17	0.17	100	a	a	a
dibromochloropropane (DBCP)	96128	a	a	a	a	15.7	0.2
1,2-dibromethane	106934	a	a	a	a	a	0.05
dieldrin	60571	0.24	0.056	1	a	0.000054	0.00014 ^b
4,6-dinitro-o-cresol	534521	a	a	a	a	280	13
dinoseb (DNBP)	88857	a	a	a	a	a	7

Table 1a. Aquatic Life, Agriculture, And Public Health Designated Uses Numeric Criteria.

PARAMETER	CAS NUMBER	Use Category					
		AQUATIC LIFE		AGRICULTURE		PUBLIC HEALTH	
		ACUTE	CHRONIC	LIVESTOCK	IRRIGATION	FOOD PROCUREMENT	DOMESTIC WATER SUPPLY
diquat	85007	a	a	a	a	a	20
disulfoton (Di_syston)	298044	a	a	100	a	a	a
endosulfan, total	115297	0.22	0.056	a	a	159	a
alpha-endosulfan	959998	0.22	0.056	a	a	89	62
beta-endosulfan	33213659	0.22	0.056	a	a	89	62
endosulfan sulfate	1031078	a	a	a	a	89	62
endothall	145733	a	a	a	a	a	100
endrin	72208	0.086	0.036	0.5	a	0.06	2
endrin aldehyde	7421934	a	a	a	a	0.3	0.76 ^b
epichlorohydrin	106898	a	a	a	a	a	4
ethylene dibromide	106934	a	a	a	a	a	0.05
fenchlorfos (Ronnel)	299843	a	a	100	a	a	a
glyphosate (Roundup)	1071836	a	a	a	a	a	700
guthion	86500	a	0.01	100	a	a	a
heptachlor	76448	0.52	0.0038	0.1	a	0.000079	0.00021 ^b
heptachlor epoxide	1024573	0.52	0.0038	0.1	a	0.00011 ^b	0.00010 ^b
hexachlorocyclohexane (HCH or BHC)	61876	100	a	a	a	0.0414	0.0123
alpha-HCH (alpha-BHC)	319846	100	a	a	a	0.0049	0.0039 ^b
beta-HCH (beta-BHC)	319857	100	a	a	a	0.046 ^b	0.014 ^b
delta-HCH (delta-BHC)	319868	100	a	a	a	a	a
gamma-HCH (gamma-BHC, lindane)	58899	0.95	0.08	5	a	1.8	0.2
technical-HCH (technical-BHC)	608731	a	a	a	a	0.0414	a
malathion	121755	a	0.1	100	a	a	a
methoxychlor	72435	a	0.03	1,000	a	a	40
methyl parathion	298000	a	a	100	a	a	a
metribuzin (Sencor)	21087649	a	100	a	a	a	a
mirex	2385855	a	0.001	a	a	0.000097	a
oxamyl (Vydate)	23135220	a	0.001	a	a	a	200
parathion	56382	0.065	0.013	100	a	a	a
pentachloronitrobenzene	82688	250	50	a	a	a	a
pentachlorophenol (PCP)	87865	table 1b	table 1b	a	a	3	0.28 ^b
picloram (Tordon)	1918021	a	a	a	a	a	500
propachlor (Ramrod)	1918167	a	8	a	a	a	a
simazine (Princep)	122349	a	a	10	a	a	4
2,4,5-T	93765	a	a	2	a	a	a
tributyltin (TBT)	56359	0.46	0.072	a	a	a	a
toxaphene	8001352	0.73	0.0002	5	a	0.00028	0.00073 ^b
2,4,5-TP (Silvex)	93721	a	a	a	a	a	50

a - Not available

b - US EPA has promulgated this criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36.

c - Criterion under investigation

d - The Biotic Ligand Model (BLM) as in the "Aquatic Life Ambient Freshwater Quality Criteria-Copper 2007 Revision (EPA-822-R-07-001, February 2007)", which is adopted by reference.

Table 1b. Hardness-Dependent Aquatic Life Support Criteria.

Formulae for calculation of hardness-dependent aquatic life support criteria for chromium III and total cadmium, total copper, total lead, total nickel, total silver and total zinc and pH-dependent aquatic life support criteria for pentachlorophenol. A WER value of 1.0 is applied in the hardness-dependent equations for total metals unless a site-specific WER has been determined and adopted by the department in accordance with K.A.R. 28-16-28e(a) and K.A.R. 28-16-28f(f). Hardness values in metal formulae are entered in units of mg/L as CaCO₃. Pentachlorophenol formulae apply only over the pH range 6.5-8.5.

CADMIUM (ug/L):

acute criterion = $WER[EXP[(1.0166(LN(hardness)))-3.924]]$

chronic criterion = $WER[EXP[(0.7409(LN(hardness)))-4.719]]$

CHROMIUM III (ug/L):

acute criterion = $WER[EXP[(0.819*(LN(hardness)))+3.7256]]$

chronic criterion = $WER[EXP[(0.819*(LN(hardness)))+0.6848]]$

LEAD (ug/L):

acute criterion = $WER[EXP[(1.273*(LN(hardness)))-1.460]]$

chronic criterion = $WER[EXP[(1.273*(LN(hardness)))-4.705]]$

NICKEL (ug/L):

acute criterion = $WER[EXP[(0.846*(LN(hardness)))+2.255]]$

chronic criterion = $WER[EXP[(0.846*(LN(hardness)))+0.0584]]$

PENTACHLOROPHENOL (ug/L):

acute criterion = $EXP[(1.005*pH)-4.830]$

chronic criterion = $EXP[(1.005*pH)-5.290]$

SILVER (ug/L):

acute criterion = $WER[EXP[(1.72*(LN(hardness)))-6.59]]$

ZINC (ug/L):

acute criterion = $WER[EXP[(0.8473*(LN(hardness)))+0.884]]$

chronic criterion = $WER[EXP[(0.8473*(LN(hardness)))+0.884]]$

Table 1c. pH-Dependent Acute Aquatic Life Criteria For Total Ammonia.

Total ammonia as N, mg/L

Acute Aquatic Life Criteria for Ammonia, mg/L	
pH	Criteria
6.5	48.8
6.6	46.8
6.7	44.6
6.8	42.0
6.9	39.1
7.0	36.1
7.1	32.8
7.2	29.5
7.3	26.2
7.4	23.0
7.5	19.9
7.6	17.0
7.7	14.4
7.8	12.1
7.9	10.1
8.0	8.40
8.1	6.95
8.2	5.72
8.3	4.71
8.4	3.88
8.5	3.20
8.6	2.65
8.7	2.20
8.8	1.84
8.9	1.56
9.0	1.32

Table 1d. pH- And Temperature-Dependent Chronic Aquatic Life Criteria For Total Ammonia Early Life Stages Of Fish Present.

Total ammonia as N, mg/L

Chronic Aquatic Life Criteria for Ammonia, Early Life Stages Present, mg/L										
pH	Temperature, °C									
	0	14	16	18	20	22	24	26	28	30
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Table 1e. pH- And Temperature-Dependent Chronic Aquatic Life Criteria For Total Ammonia Early Life Stages Of Fish Absent.

Total ammonia as N, mg/L.

Chronic Aquatic Life Criteria for Ammonia, Early Life Stages Absent*, mg/L								
pH	Temperature, °C							
	0-7	8	9	10	11	12	13	14**
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79
6.7	10.5	9.81	9.2	8.62	8.08	7.58	7.11	6.66
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684
8.9	0.917	0.860	0.806	0.456	0.709	0.664	0.623	0.584
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503

*Early life stage absent criteria will apply to all Kansas surface waters during the months November through February except in surface water segments listed in Table 1f. The application of early life stage absent criteria outside of the months November through February shall require a segment-specific examination of the surface water for the presence of early life stages of fish.

** At 15°C and above, the criterion for early life stages absent is equivalent to the criterion for early life stages present.

**Table 1f. Surface Water Segments Where Early Life Stages of Fish Present
Chronic Aquatic Life Criteria Are Applicable.**

Surface Water	Basin	Subbasin	Hydrologic Unit Code	Segment Number
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	1
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	2
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	3
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	4
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	5
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	18
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	19
Kansas River	Kansas Lower Republican	Lower Kansas	10270104	21 From Bowersock dam east to segment 19
Missouri River	Missouri	Tarkio-Wolf	10240005	1
Missouri River	Missouri	Tarkio-Wolf	10240005	2
Missouri River	Missouri	Tarkio-Wolf	10240005	19
Missouri River	Missouri	Tarkio-Wolf	10240005	20
Missouri River	Missouri	Tarkio-Wolf	10240005	21
Missouri River	Missouri	Independence-Sugar	10240011	1
Missouri River	Missouri	Independence-Sugar	10240011	2
Missouri River	Missouri	Independence-Sugar	10240011	4
Missouri River	Missouri	Independence-Sugar	10240011	5
Missouri River	Missouri	Independence-Sugar	10240011	7
Missouri River	Missouri	Independence-Sugar	10240011	9
Missouri River	Missouri	Independence-Sugar	10240011	11
Missouri River	Missouri	Independence-Sugar	10240011	13
Missouri River	Missouri	Independence-Sugar	10240011	15
Missouri River	Missouri	Independence-Sugar	10240011	19

Table 1g. Temperature, Dissolved Oxygen, And pH Numeric Aquatic Life Criteria.

Aquatic Life Use	Dissolved Oxygen (DO)	pH	Temperature
Special	5.0 mg/L ^a	6.5-8.5 ^b	32°C ^c
Expected	5.0 mg/L ^a	6.5-8.5 ^b	32°C ^c
Restricted	5.0 mg/L ^a	6.5-8.5 ^b	32°C ^c

a - (1) The concentration of dissolved oxygen in surface waters shall not be lowered by the influence of artificial sources of pollution. (2) Dissolved oxygen concentrations can be lower than 5.0 mg/L when caused by documented natural conditions specified in the "Kansas Implementation Procedures: Surface Water Quality Standards". (3) For lakes or reservoirs experiencing thermal stratification, the dissolved oxygen criterion is only applicable to the top layer or epilimnion of the waterbody.

b - pH range outside the zone of initial dilution.

c - (1) Beyond the zone of initial dilution a discharge shall not elevate the temperature of a receiving surface water above this temperature, except as provided in paragraph 28-16-28e(c)(2)(C)(ii). (2) Additional requirements in paragraph 28-16-28e(c)(2)(C)(i).

Table 1h. Natural Background Concentrations.

BASIN	HUC 8	SEGMENT / LAKE NUMBER	WATERBODY	POLLUTANT	NATURAL BACKGROUND CONCENTRATION
Cimarron	11040006	1	Cimarron River	Chloride	1,010 mg/L
Cimarron	11040007	1	Crooked Creek	Chloride	1,200 mg/L
Cimarron	11040008	2	Bluff Creek	Sulfate	350 mg/L
Cimarron	11040008	5	Cimarron River	Chloride	900 mg/L
Cimarron	11040008	5	Cimarron River	Sulfate	465 mg/L
Kansas Lower Republican	10250017	29	Buffalo Creek	Chloride	590 mg/L
Kansas Lower Republican	10270701	6	Kansas River	Chloride	275 mg/L
Kansas Lower Republican	10270101	6	Kansas River	Sulfate	300 mg/L
Lower Arkansas	11030009	1	Rattlesnake Creek above the Little Salt Marsh in Quivira National Wildlife Refuge	Chloride	1,400 mg/L
Lower Arkansas	11030009	1	Rattlesnake Creek below the Little Salt Marsh in Quivira National Wildlife Refuge	Chloride	3,660 mg/L
Lower Arkansas	11030009	1	Rattlesnake Creek above and below the Little Salt Marsh in Quivira National Wildlife Refuge	Sulfate	455 mg/L
Lower Arkansas	11030010	1	Arkansas River	Chloride	620 mg/L
Lower Arkansas	11030010	3	Arkansas River	Chloride	650 mg/L
Lower Arkansas	11030010	4	Arkansas River	Chloride	650 mg/L
Lower Arkansas	11030010	6	Peace Creek	Chloride	1,800 mg/L
Lower Arkansas	11030010	7	Salt Creek	Chloride	1,300 mg/L
Lower Arkansas	11030011	1	Cow Creek near Willowbrook	Chloride	300 mg/L
Lower Arkansas	11030011	2	Little Cow Creek	Chloride	300 mg/L
Lower Arkansas	11030011	3	Cow Creek near Lyons	Chloride	460 mg/L
Lower Arkansas	11030011	1755	Cow Creek	Chloride	300 mg/L
Lower Arkansas	11030013	1	Arkansas River	Chloride	345 mg/L
Lower Arkansas	11030013	2	Arkansas River	Chloride	265 mg/L
Lower Arkansas	11030013	3	Arkansas River	Chloride	385 mg/L
Lower Arkansas	11030013	3	Arkansas River	Sulfate	350 mg/L
Lower Arkansas	11030013	LM014201	Slate Creek W.A. Watershed	Chloride	27,590 mg/L

Table 1h. Natural Background Concentrations.

BASIN	HUC 8	SEGMENT / LAKE NUMBER	WATERBODY	POLLUTANT	NATURAL BACKGROUND CONCENTRATION
Lower Arkansas	11030013	LM014201	Slate Creek W.A. Watershed	Sulfate	2,500 mg/L
Lower Arkansas	11030015	3	Ninnescah River, South Folk	Chloride	265 mg/L
Lower Arkansas	11060002	4	Arkansas River, Salt Folk	Chloride	305 mg/L
Lower Arkansas	11060002	4	Arkansas River, Salt Folk	Sulfate	730 mg/L
Lower Arkansas	11060002	7	Mule Creek	Sulfate	310 mg/L
Lower Arkansas	11060003	2	Medicine Lodge River	Sulfate	450 mg/L
Lower Arkansas	11060003	6	Medicine Lodge River	Sulfate	525 mg/L
Lower Arkansas	11060003	8	Medicine Lodge River	Sulfate	300 mg/L
Lower Arkansas	11060003	27	Soldier Creek	Sulfate	300 mg/L
Neosho	11070202	5	Clear Creek	Sulfate	290 mg/L
Neosho	11070202	16	French Creek	Sulfate	1,045 mg/L
Neosho	11070202	17	Cottonwood River, South	Sulfate	840 mg/L
Neosho	11070202	21	Doyle Creek	Sulfate	370 mg/L
Neosho	11070205	LM035901	Mined Land Lake 12	Sulfate	1,000 mg/L
Neosho	11070205	LM036801	Mined Land Lake 22	Sulfate	1,000 mg/L
Neosho	11070205	LM036901	Mined Land Lake 23	Sulfate	1,000 mg/L
Neosho	11070205	LM037301	Mined Land Lake 27	Sulfate	1,000 mg/L
Neosho	11070205	LM037601	Mined Land Lake 30	Sulfate	1,000 mg/L
Neosho	11070205	LM038841	Mined Land Lake W.A.	Sulfate	1,000 mg/L
Neosho	11070205	LM048201	Mined Land Lake 17	Sulfate	1,000 mg/L
Neosho	11070205	LM048401	Mined Land Lake 44	Sulfate	1,000 mg/L
Neosho	11070207	LM047601	Mined Land Lake 6	Sulfate	1,000 mg/L
Neosho	11070207	LM047801	Mined Land Lake 7	Sulfate	1,000 mg/L
Smoky Hill-Saline	10260003	9	Smoky Hill River	Sulfate	500 mg/L
Smoky Hill-Saline	10260003	17	Smoky Hill River	Sulfate	700 mg/L
Smoky Hill-Saline	10260003	21	Smoky Hill River	Sulfate	700 mg/L
Smoky Hill-Saline	10260003	LM013001	Cedar Bluff Lake	Sulfate	452 mg/L
Smoky Hill-Saline	10260006	5	Smoky Hill River	Chloride	435 mg/L

Table 1h. Natural Background Concentrations.

BASIN	HUC 8	SEGMENT / LAKE NUMBER	WATERBODY	POLLUTANT	NATURAL BACKGROUND CONCENTRATION
Smoky Hill-Saline	10260006	9	Smoky Hill River	Chloride	625 mg/L
Smoky Hill-Saline	10260006	15	Smoky Hill River	Chloride	820 mg/L
Smoky Hill-Saline	10260006	15	Smoky Hill River	Sulfate	411 mg/L
Smoky Hill-Saline	10260006	21	Smoky Hill River	Sulfate	464 mg/L
Smoky Hill-Saline	10260008	3	Chapman Creek	Sulfate	370 mg/L
Smoky Hill-Saline	10260008	6	Smoky Hill River	Chloride	265 mg/L
Smoky Hill-Saline	10260008	6	Smoky Hill River	Sulfate	325 mg/L
Smoky Hill-Saline	10260008	8	Mud Creek	Sulfate	400 mg/L
Smoky Hill-Saline	10260008	18	Gypsum Creek	Sulfate	325 mg/L
Smoky Hill-Saline	10260008	25	Holland Creek	Sulfate	1,200 mg/L
Smoky Hill-Saline	10260008	28	Turkey Creek	Sulfate	1,200 mg/L
Smoky Hill-Saline	10260008	35	Carry Creek	Sulfate	400 mg/L
Smoky Hill-Saline	10260009	5	Paradise Creek	Chloride	860 mg/L
Smoky Hill-Saline	10260009	5	Paradise Creek	Sulfate	630 mg/L
Smoky Hill-Saline	10260009	8	Saline River	Chloride	860 mg/L
Smoky Hill-Saline	10260009	8	Saline River	Sulfate	500 or 780 mg/L *
Smoky Hill-Saline	10260009	9	Saline River	Sulfate	390 mg/L
Smoky Hill-Saline	10260009	LM014001	Wilson Lake	Chloride	680 mg/L
Smoky Hill-Saline	10260009	LM014001	Wilson Lake	Sulfate	480 mg/L
Smoky Hill-Saline	10260010	1	Saline River	Chloride	300 mg/L
Smoky Hill-Saline	10260010	1	Saline River	Sulfate	375 mg/L
Smoky Hill-Saline	10260010	3	Saline River	Chloride	370 mg/L
Smoky Hill-Saline	10260010	3	Saline River	Sulfate	390 mg/L

Table 1h. Natural Background Concentrations.

BASIN	HUC 8	SEGMENT / LAKE NUMBER	WATERBODY	POLLUTANT	NATURAL BACKGROUND CONCENTRATION
Smoky Hill-Saline	10260010	10	Wolf Creek	Chloride	390 mg/L
Smoky Hill-Saline	10260010	10	Wolf Creek	Selenium	7 µg/L **
Smoky Hill-Saline	10260010	10	Wolf Creek	Sulfate	450 mg/L
Smoky Hill-Saline	10260010	14	Bullfoot Creek	Sulfate	300 mg/L
Smoky Hill-Saline	10260010	17	Elkhorn Creek	Sulfate	425 mg/L
Solomon	10260012	2	Oak Creek	Selenium	12 µg/L
Solomon	10260012	10	Beaver Creek	Selenium	16 µg/L
Solomon	10260012	23	Deer Creek	Selenium	9 µg/L
Solomon	10260014	18	Kill Creek	Selenium	9 µg/L
Solomon	10260014	18	Kill Creek	Sulfate	540 mg/L
Solomon	10260014	19	Covert Creek	Selenium	6 µg/L
Solomon	10260014	19	Covert Creek	Sulfate	610 mg/L
Solomon	10260014	20	Twin Creek	Selenium	12 µg/L
Solomon	10260014	20	Twin Creek	Sulfate	730 mg/L
Solomon	10260014	21	Carr Creek	Selenium	8 µg/L
Solomon	10260014	21	Carr Creek	Sulfate	690 mg/L
Solomon	10260015	1	Solomon River	Chloride	370 mg/L
Solomon	10260015	12	Solomon River	Chloride	400 mg/L
Solomon	10260015	18	Limestone Creek	Selenium	6.6 µg/L
Solomon	10260015	18	Limestone Creek	Sulfate	300 mg/L **
Solomon	10260015	27	Salt Creek	Chloride	650 mg/L
Solomon	10260015	27	Salt Creek	Sulfate	310 mg/L
Upper Arkansas	11030001	1	Arkansas River	Sulfate	1,875 mg/L
Upper Arkansas	11030001	3	Arkansas River	Selenium	7 or 10 µg/L ***
Upper Arkansas	11030001	9	Arkansas River	Selenium	7 or 10 µg/L ***
Upper Arkansas	11030003	1	Arkansas River	Selenium	7 or 10 µg/L ***
Upper Arkansas	11030003	1	Arkansas River	Sulfate	350 mg/L
Upper Arkansas	11030004	1	Arkansas River	Sulfate	1,000 mg/L
Upper Arkansas	11030004	10	Arkansas River	Fluoride	1.45 mg/L
Upper Arkansas	11030004	10	Arkansas River	Sulfate	550 mg/L

Table 1h. Natural Background Concentrations.

BASIN	HUC 8	SEGMENT / LAKE NUMBER	WATERBODY	POLLUTANT	NATURAL BACKGROUND CONCENTRATION
Upper Arkansas	11030004	11	Arkansas River	Sulfate	350 mg/L
Upper Republican	10250001	1	Arikaree River	Selenium	9 µg/L
Upper Republican	10250003	2	Republican River, South Fork	Fluoride	1.45 mg/L
Upper Republican	10250003	9	Republican River, South Fork	Fluoride	1.20 mg/L
Walnut	11030017	18	Whitewater River	Sulfate	390 mg/L
Walnut	11030018	30	Eightmile Creek	Sulfate	520 mg/L

* 780 mg/L applies when stream flows are above the normal flow

** Only applies when stream flows are above the median (50 percentile) flow

*** From April to October, 7 µg/L applies; from November to March, 10 µg/L applies.

Table 1i. *Escherichia coli* Criteria For Classified Stream Segments.

Use	Colony Forming Units (CFUs)/100mL	
Primary Contact Recreation	Geometric Mean	Geometric Mean
	Apr. 1 – Oct. 31	Nov. 1 – Mar. 31
Class A	160	2358
Class B	262	2358
Class C	427	3843
Secondary Contact Recreation	Geometric Mean	
	Jan. 1 – Dec. 31	
Class a	2358	
Class b	3843	

Table 1j. *Escherichia coli* Criteria For Classified Surface Waters Other Than Classified Stream Segments.

Use	Colony Forming Units (CFUs)/100mL			
Primary Contact Recreation	Geometric Mean	Geometric Mean	Single Sample Maximum	Single Sample Maximum
	Apr. 1 – Oct. 31	Nov. 1 – Mar. 31	Apr. 1 – Oct. 31	Nov. 1 – Mar. 31
Swimming Beach	160	800	732	3655
Public Access	262	1310	1198	6580
Restricted Access	427	2135	1950	9760
Secondary Contact Recreation	Geometric Mean		Single Sample Maximum	
	Jan. 1 – Dec. 31		Jan. 1 – Dec. 31	
Public Access	2135		9760	
Restricted Access	2135		9760	

Table 1k. Chlorophyll-a Criteria For Lakes Or Reservoirs With Active^a Or Reserve^b Domestic Water Supply Use.

	Lakes or Reservoirs with Domestic Water Supply Use
Chlorophyll-a	The lesser value ^c of 10 µg/L or long-term average ^d

- a. These lakes or reservoirs are currently being used as domestic water supply sources.
- b. These lakes or reservoirs are not currently being used as domestic or public water supply sources, but they are listed as backup supplies by municipalities and other public water suppliers, or the active water rights for water supply uses are still being held by the municipalities and other public water suppliers.
- c. With an exception for Cheney Lake, the criterion for Cheney Lake is set at the action level of 11 µg/L according to "A Comparative Water Quality Study of Cheney Reservoir, Kansas" by Smith et al, 2001.
- d. Running average of a minimum of 4 samples over a 12-year period. For any lake or reservoir with insufficient data, the criterion is set at 10 µg/L until a long-term average can be calculated, and the new criterion will be the lesser value of 10 µg/L or the long-term average.

Table 11. Current Lakes Or Reservoirs Serving As Active Or Reserve Domestic Water Supply.

Lake Number	Register Name (with Local Name)
LM050001	Alma City Lake
LM040001	Augusta City Lake
LM041601	Augusta Santa Fe Lake
LM032001	Banner Creek Lake
LM031001	Big Hill Lake (Pearson-Skubitz Big Hill Lake)
LM046401	Blue Mound City Lake
LM043901	Bone Creek Lake
LM046201	Bronson City Lake
LM072601	Caney City Lake (Timber Hill Lake)
LM013001	Cedar Bluff Lake
LM044101	Cedar Creek Reservoir
LM040701	Cedar Valley Lake
LM073701	Centralia Lake
LM017001	Cheney Lake
LM030001	Clinton Lake
LM043001	Council Grove City Lake
LM022001	Council Grove Lake
LM051301	Critzer Lake
LM064901	Crystal Lake
LM071701	Edna City Lake
LM033001	El Dorado Lake
LM025001	Elk City Lake
LM040201	Eureka Lake (Eureka Old City Lake)
LM023001	Fall River Lake
LM045001	Fort Scott City Lake
LM040401	Gardner City Lake
LM040601	Garnet North City Lake
LM040801	Harveyville Lake (Harveyville City Lake)
LM069701	Herington City Lake
LM047201	Herington Reservoir
LM035001	Hillsdale Lake
LM073901	Jetmore Lake
LM026001	John Redmond Lake
LM016001	Kanopolis Lake
LM043401	Lake Kahola
LM041201	Lebo City Lake
Not Assigned	Linn Valley Lake

Table 11. Current Lakes Or Reservoirs Serving As Active Or Reserve Domestic Water Supply.

Lake Number	Register Name (with Local Name)
LM065701	Louisburg Old Lake
LM043801	Louisburg SFL (Louisburg Middle Creek SFL)
LM065901	Lyndon City Lake
LM051801	Madison City Lake
LM020001	Marion Lake
LM027001	Melvern Lake
LM019001	Milford Lake
LM051001	Miola Lake (Lake Miola)
LM013601	Mission Lake
LM071901	Moline Reservoir
LM051401	Mound City Lake
LM048701	Murray Gill Lake (Quivira Boy Scout Lake)
LM049901	New Alma City Lake
LM061301	New Olathe Lake
LM053801	New Yates Center Lake (Yates Center Reservoir)
LM010001	Norton Lake (Sebelius Lake)
LM066101	Osage City Reservoir
LM053901	Otis Creek Lake (Eureka)
LM066301	Parker City Lake
LM041401	Parsons Lake
LM029001	Perry Lake
LM044201	Pleasanton Reservoir (Pleasanton City Lake East)
LM012701	Polk Daniels Lake (Elk Co. SFL)
LM028001	Pomona Lake
LM073001	Pony Creek Lake
LM061901	Prairie Lake
LM066601	Prescott City Lake
LM022501	Quarry Lake
LM046801	Richmond City Lake
LM011501	Sabetha City Lake
LM072001	Sedan City South Lake
LM072101	Severy City Lake
LM073501	Spring Hill City Lake
LM051201	Strowbridge Reservoir (Carbondale East Lake)
LM049601	Thayer New City Lake
LM069101	Timber Lake
LM024001	Toronto Lake
LM021001	Tuttle Creek Lake

Table 11. Current Lakes Or Reservoirs Serving As Active Or Reserve Domestic Water Supply.

Lake Number	Register Name (with Local Name)
LM042001	Wabaunsee Co. Lake
LM018001	Waconda Lake
LM042201	Wellington Lake (Wellington Old City Lake)
LM042301	Wellington New City Lake
LM050801	Winfield City Lake
LM074401	Xenia Lake
LM069201	Yates Center Reservoir (South Owl Lake)