KANSAS DEPARTMENT OF HEALTH AND ENVIRONMENT

DIVISION OF ENVIRONMENT

REGULATORY IMPACT STATEMENT

PURSUANT TO K.S.A. 2012 SUPP. 77-416

Proposed Amendments to Regulations K.A.R. 28-16-28b through 28-16-28f and K.A.R. 28-16-58

JULY 7, 2014

Regulatory Impact Statement
K.A.R. 28-16-28b through K.A.R. 28-16-28f and 28-16-58

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A. Introduction

K.A.R. 28-16-28b through 28-16-28g comprise what is referred to as the Kansas Surface Water Quality Standards (KSWQS). In accordance with section 303 of the Clean Water Act (CWA), states must review and revise their WQS once every three years, which is referred to as the triennial review. According to the CWA, the public must be involved in the triennial review process. The CWA does not state how this is to be done, but it was the intent of Kansas Department of Health and Environment (KDHE) to get the most public involvement as possible. K.A.R. 28-16-58 addresses wastewater permitting as it relates to the KSWQS.

In 2009, KDHE began the triennial review process by using the same methodology that had been used in the last triennial review. The methodology was intended to draw focus on a few principal issues that could be discussed in detail, while still allowing any part of the KSWQS to be reviewed and comments received. Key to this process was the formation of a small, diverse group of individuals who had previously shown a clear interest in the state's Water Quality Standards. The 13 person group was formed to provide a balanced membership representing: 1) the regulated community, 2) environmental advocacy groups, 3) technical groups, and 4) regulators. The group met three times over a 14-month period to identify key issues that they thought would be most valuable to discuss as KDHE held its public meetings around the state. The group identified six key issues (antidegradation, bacteria, chlorophyll-a, dissolved oxygen, duration and frequency, and temperature), which were discussed at seven public meetings throughout the state. Comments received on these key issues along with other public and internal KDHE comments have lead to the changes made in the KSWQS.

B. Summary of Proposed Amendments

There are many style and editorial changes to the regulations. But the major amendments proposed are:

- adopting the Biotic Ligand Model for copper aquatic life criteria;
- specifying duration and frequency of numeric criteria for assessment purposes;
- clarifying dissolved oxygen aquatic life criteria;
- adopting a number of criteria from the National Drinking Water Regulations, National Recommended Water Quality Criteria or the Clean Water Act 304(a) criteria, and the National Toxic Rules (40 CFR 131.36);
- adopting criteria for chlorophyll-a for active and reserve domestic water supply lakes or reservoirs;

II. <u>Economic Impact Statement</u>

1. Are the proposed regulations or amendments mandated by federal law as a requirement for participating in or implementing a federally subsidized or assisted program?

Yes. Section 303 of the Clean Water Act (CWA) requires States that have assumed authority and responsibility for water quality programs from the Environmental Protection Agency (EPA) to conduct a review of existing Water Quality Standards (WQS) from time to time, but at least once every three years. States are to amend their WQS following the triennial review in response to public participation, new available science, and/or newly adopted federal requirements. Following the adoption of the revised WQS, they must be submitted to the EPA for approval.

2. Do the proposed regulations or amendments exceed the requirements of applicable federal law?

No. The proposed WQS are set by federal regulations and EPA guidelines authorized by the CWA.

3. Description of costs to agencies, to the general public and to persons who are affected by, or are subject to, the regulations:

The core requirements of the WQS have not been changed substantially. There are a few of the proposed changes which have a potential cost associated with implementation. The cost of implementation would mostly be incurred by KDHE.

a. Capital and annual costs of compliance with the proposed regulations or amendments and the persons who will bear those costs.

<u>Copper Aquatic Life Criteria – Biotic Ligand Model:</u> The BLM is strongly supported by the copper industries. In Kansas, only a limited number of NPDES facilities have actual permit limits for copper. From KDHE's preliminary analyses, the BLM-based criteria are likely the same or even higher (less stringent) than the current hardness-based criteria for these facilities. The NPDES facilities may incur additional costs for sample collection and analysis for the parameters required for the BLM. But the additional costs for sampling and analysis will not likely be significant or burdensome to these facilities.

Chlorophyll-a Criteria for Public Drinking Water Supply Lakes or Reservoirs: Since most of the PWS reservoirs or lakes are located in rural areas, few wastewater dischargers are located above those lakes and reservoirs. Therefore, nonpoint sources are likely the major contributors of nutrients to these PWS reservoirs or lakes. The cost for controlling nutrient inputs from the non-point sources will depend on the size of the watershed, current management practices, and severity of the existing problem. However, the cost may be mitigated by cost-sharing programs available through Division of Conservation at Kansas Department of Agriculture, or the US Department of Agriculture's Natural Resources Conservation Service programs. Reduction in nutrient loads will likely reduce the operating costs of drinking water plants since fewer chemicals are needed to treat the water. In the long run, a local community may save a significant amount of money by not having to upgrade the drinking water plant in order to deal with nutrient enrichment issues. The benefits to the drinking water plants, consumers, and local communities will offset, and may outweigh the cost associated with nutrient reduction. Furthermore, adoption of criteria may provide warning to public water suppliers of threatening conditions developing in their source water, allowing for more orderly contingency planning to maintain service.

Changes in Numeric Table 1a (Excluding the Copper Aquatic Life Criteria): The proposed changes are listed in Appendix A. The impacts to the regulated communities will be minimal. The cost of implementation will be borne by KDHE.

Changes for Dissolved Oxygen Criteria: No additional capital cost is expected for the regulated communities. The cost of implementation will be borne by KDHE.

Duration and Frequency: No additional capital cost is expected for the regulated communities. The cost of implementation will be borne by KDHE.

Updated Natural Background Concentrations: The background concentrations are determined by Total Maximum Daily Loads (TMDLs). All the updates in the table are already in effect for Kansas. No additional capital cost is expected to the regulated communities. The cost of implementation will be borne by KDHE.

b. Initial and annual costs of implementing and enforcing the proposed regulations or amendments, including the estimated amount of paperwork, and the state agencies, other governmental agencies or other persons or entities who will bear the costs.

KDHE will bear sole responsibility for implementing and enforcing the proposed regulations. The anticipated fiscal impact for SFY 14 and SFY 15 by the amended KSWQS will be negligible since the additional workload will be absorbed by existing KDHE Bureau of Water staff.

c. Costs which would likely accrue if the proposed regulations or amendments were not adopted; the persons who will bear the costs and those who will be affected by the failure to adopt the regulations.

The chlorophyll-a criteria should present cost savings for public drinking water plants. If nutrient enrichment is not adequately and promptly addressed in source waters, the cost of treatment for drinking water could potentially increase significantly. Adopting the criteria will allow earlier identifications of the problems through the 303(d) List. Appropriate mitigation strategies can then be developed through the Total Maximum Daily Loads (TMDLs). In recent years, the harmful algal blooms in lakes or reservoirs have cost state and local communities huge amounts of monetary damages. One of the main contributors for these harmful algal blooms in lakes or reservoirs is nutrient enrichment. Addressing nutrient problems in the domestic water supply lakes or reservoirs will also prevent or reduce the occurrences of the harmful algal blooms in these lakes or reservoirs.

For the dissolved oxygen (DO) criteria, continuation of the status quo could allow some waters to remain perpetually listed as impaired when the cause of DO depression is the result of naturally occurring conditions. The consequence of listing waters as impaired includes the implication that certain waters are polluted, thus lessening its value and potential uses that could be made of that water. Providing an allowance for naturally occurring conditions would allow waters to be assessed as unimpaired based on their natural state. Such a provision would direct state and federal resources toward true impairment issues, increasing the efficacy of water quality restoration efforts.

For duration and frequency, continuation of the status quo invites potential challenges to the KDHE’s methodology for assessing and listing impaired waters. Challenges could result in prolonged and expensive legal proceedings. Adopting a modification to the Kansas Surface Water Quality Standards (KSWQS) that incorporates Kansas’ methodology for interpreting duration and frequency as a part of the WQS Implementation Procedures should provide KDHE a strong defense from any such challenges. Securing a provision for allowance of the occasional digression from water quality standards also directs water quality restoration efforts toward waters that are truly impaired, thereby increasing the effectiveness of those efforts.

For copper and other numeric criteria, adopting the National Recommended Criteria (304(a)) is always recommended by EPA since the 304(a) criteria reflect the latest available data and scientific knowledge. EPA also recommends the 304(a) criteria be adopted within two Triennial Review cycles after the publication dates of the criteria. With consideration of potential costs to the regulated communities, KDHE has proposed to adopt a number of the National Recommended Criteria. If a state is taking too long to adopt the 304(a) criteria, EPA could potential promulgate the criteria on behalf of the state. For example, EPA promulgated the National Toxics Rules which applies to Kansas and a few other states.

d. A detailed statement of the data and methodology used in estimating the costs used in the statement.

The data used to estimate cost was based on current employee salaries, laboratory costs, and contractual obligations. The method used to determine cost was a simple estimation based on past experiences and costs incurred.

e. Description of any less costly or less intrusive methods that were considered by the agency and why such methods were rejected in favor of the proposed regulations.

KDHE is aware of the current economic conditions and has only proposed changes that are considered the most important and cost effective. Overall, the costs to implement the changes are considered minimal. KDHE bears the majority of the potential costs for implementation.

f. Consultation with League of Kansas Municipalities, Kansas Association of Counties, and Kansas Association of School Boards.

Copies of the proposed regulations, regulatory impact statement and notice of hearing were mailed electronically to these groups at the beginning of the public comment period.

III. Environmental Benefits Statement

1. Need for proposed amendments and environmental benefit likely to accrue.

a. Need

These regulations are being proposed to finish the triennial review in compliance with section 303 of the CWA.

b. Environmental benefit

The chlorophyll-a criteria should present cost savings for public drinking water plants and improve overall water quality for the public water supply lakes or reservoirs.

In accordance with section 304 of the CWA, EPA must from time to time develop, revise, and publish water quality criteria that accurately reflect the latest scientific knowledge. In 2009, EPA published a revised National Recommended Water Quality Criteria. KDHE has adopted a number of the National Recommended Water Quality Criteria to reflect these changes and is committed to protecting the environment and public health.

2. When applicable, a summary of the research or data indicating the level of risk to the public health or the environment being removed or controlled by the proposed regulations or amendments.

The U.S. EPA in accordance with section 304(a) of the CWA published the first national recommended water quality criteria with the "Blue Book" in 1973. Since that time, the EPA has made periodic updates to the national criteria through the "Red Book" in 1976, "Gold Book" in 1986, the 1998 Update, the 2002 update, and the latest update in 2009.

3. If specific contaminants are to be controlled by the proposed regulation or amendment, a description indicating the level at which the contaminants are considered harmful according to current available research.

Appendix A is a table of KDHE's proposed changes to the numeric criteria 1a based on EPA's 2009 National Recommended Water Quality Criteria for surface waters and the Maximum Contaminant Levels in drinking water standards:

Appendix A

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

PARAMETER	CAS NUMBER	Use Category: AQUATIC LIFE: ACUTE	AQUATIC LIFE: CHRONIC	AGRICULTURE: LIVESTOCK	AGRICULTURE: IRRIGATION	PUBLIC HEALTH: FOOD PROCUREMENT	PUBLIC HEALTH: 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	~~b~~ 0.14	~~b~~ 0.018
arsenic (V)	a	850	48	a	a	a	a
barium, total	7440393	a	a	a	a	a	~~1000~~ 2000
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	~~table 1b~~ BLM[d]	~~table 1b~~ BLM[d]	500	200	a	~~1300~~ 1000
lead, total	7439921	table 1b	table 1b	100	5,000	a	15
mercury, total	7439976	1.4	0.77	10	a	0.146	~~b~~ 2
nickel, total	7440020	table 1b	table 1b	500	200	4,600	610
selenium, total	7782492	20	5	50	20	4,200	~~170~~ 50
selenium (V)	a	11.2	a	a	a	a	a
silver, total	7440224	table 1b	a	a	a	a	~~50~~ 100
thallium, total	7440280	1,400	40	a	a	~~b~~ 6.3[b]	2
zinc, total	7440666	table 1b	table 1b	25,000	2,000	26,000	~~7400~~ 5000
OTHER INORGANIC SUBSTANCES (µg/L)							
ammonia	7664417	table 1c	table 1c	a	a	a	a
asbestos (fibers>10µm) (~~µ~~millon fibers/L)	12001295	a	a	a	a	a	7 ~~000000~~

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
~~phosphorus, elemental (white)~~	~~7723140~~	~~a~~	~~0.1~~	~~a~~	~~a~~	~~a~~	~~a~~
sulfate	14808798	a	a	1,000,000	a	a	250,000
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	~~b~~ 0.030
2-chloroethyl vinyl ether	110758	360	120	a	a	a	a
bis(2-chloroisopropyl) ether	108601	238,000	a	a	a	65,000	~~b~~ 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~~ 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	~~b~~ 99[b]	~~b~~ 0.38[b]
hexachloroethane	67721	980	540	a	a	3.3	~~b~~ 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	~~3.3~~ 4.0	~~b~~ 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	~~b~~ 0.6[b]
Chlorinated ethenes							
chlorinated ethylenes, total	a	11,600	a	a	a	a	a
chloroethylene (vinyl chloride)	75014	a	a	a	a	~~525~~ 2.4	2
1,1-dichloroethylene	75354	11,600	a	a	a	7,100	~~b~~ 7
cis-1,2-dichloroethylene	156592	11,600	a	a	a	a	70
trans-1,2-dichloroethylene	156605	11,600	a	a	a	~~140000~~ 10,000	100
tetrachloroethylene (PCE)	127184	5,280	840	a	a	3.3	~~5~~ 0.8[b]
trichloroethylene (TCE)	79016	45,000	21,900	a	a	30	~~5~~ 2.7[b]

Chlorinated propanes/propenes							
1,2-dichloropropane	78875	23,000	5,700	9	a	15	~~0.5~~ 5
1,3-dichloropropene	542756	~~6600~~ 6060	244	a	a	14.1	~~b~~ 10[b]
Halogenated methanes							
bromochloromethane	74975	11,000	a	a	a	15.7	a
bromodichloromethane (dichlorobromomethane)	75274	11,000	a	a	a	17	~~b~~ 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
dibromochloromethane (chlorodibromomethane)	124481	11,000	a	a	a	13	~~b~~ 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	~~4.7~~ 5
halogenated methanes, total	a	11,000	a	a	a	15.7	100
tetrachloromethane (carbon tetrachloride)	56235	35,200	a	a	a	~~b~~ 4.4[b]	~~5~~ 0.25[b]
tribromochloromethane	594150	11,000	a	a	a	15.7	a
tribromomethane (bromoform)	75252	11,000	a	a	a	140	~~b~~ 4.3
trichlorofluoromethane	75694	11,000	a	a	a	15.7	a
trichloromethane (chloroform)	67663	28,900	1,240	a	a	470	~~b~~ 5.7
Other halogenated aliphatic hydrocarbons							
hexachlorobutadiene	87683	90	9.3	a	a	18	~~b~~ 0.44
hexachlorocyclopentadiene	77474	7	5.2	a	a	~~206~~ 1,100	50
C. Monocyclic Aromatic Hydrocarbons except Phenols and Phthalates........							
Benzenes							
aminobenzene (~~analine~~aniline)	62533	14	6.7	a	a	a	a
benzene	71432	5,300	a	a	a	51	~~5~~ 1.2[b]
ethylbenzene	100414	32,000	a	a	a	~~28712~~ 2,100	700
nitrobenzene	98953	27,000	a	a	a	690	~~b~~ 17
vinylbenzene (styrene)	100425	a	a	a	a	a	100
Chlorinated benzenes							
chlorobenzene	108907	250	50	a	a	1,600	~~130~~ 100
dichlorobenzenes, total	25321226	1,120	763	a	a	2,600	a
1,2-dichlorobenzene (o-dichlorobenzene)	95501	1,120	763	a	a	~~2600~~ 1300	600
1,3-dichlorobenzene (m-dichlorobenzene)	541731	1,120	763	a	a	960	~~b~~ 400[b]
1,4-dichlorobenzene (p-dichlorobenzene)	106467	a	a	a	a	~~2600~~ 190	75
hexachlorobenzene	118741	6	3.7	a	a	0.00029	~~b~~ 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	~~940~~ 70	~~260~~ 70
Toluenes and xylenes							
2,4-dinitrotoluene	121142	330	230	a	a	3.4	~~b~~ 0.11
dinitrotoluenes, total	25321146	330	230	a	a	9.1	a
toluene	108883	17,500	a	a	a	~~b~~ 15,000	1,000
xylenes, total	1330207	a	a	a	a	a	10,000
D. Nitrogen Compounds Except Monocyclic Aromatics...........							
acrylonitrile	107131	7,550	2,600	a	a	0.25	~~b~~ 0.059[b]
benzideine	92875	2,500	a	a	a	0.0002	~~b~~ 0.00012[b]
3,3-dichlorobenzidine	91941	a	a	a	a	~~0.02~~ 0.028	~~b~~ 0.04[b]
1,2-diphenylhydrazine	122667	270	a	a	a	0.2	~~b~~ 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	~~b~~ 0.00069
N-nitrosodiphenylamine	86306	5,850	a	a	a	6	~~b~~ 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	~~b~~ 69
nitrophenols, total	a	230	150	a	a	a	a
phenol	108952	10,200	2,560	a	a	~~1,700,000~~ 860,000	~~b~~ 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	~~b~~ 790[b]	~~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	~~b~~ 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	~~b~~ 4,500	~~b~~ 2,000
diethyl phthalate	84662	a	a	a	a	~~b~~ 44,000	17,000
dimethyl phthalate	131113	940	3	a	a	1,100,000	~~b~~ 270,000
bis~~di~~(2-ethylhexyl) phthalate (DEHP)	117817	400	360	a	a	~~b~~ 5.9[b]	~~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	~~b~~ 9,600[b]
benzo(a)anthracene	56553	a	a	a	a	0.018	~~b~~ 0.0038
benzo(a)pyrene	50328	a	a	a	a	0.018	~~b~~ 0.0028[b]
benzo(b)fluoranthene	205992	a	a	a	a	0.018	~~b~~ 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	~~b~~ 0.0038
2-chloronaphthalene	91587	a	a	a	a	1,600	1,000
chrysene	218019	a	a	a	a	0.018	~~b~~ 0.0038
dibenzo(a,h)anthracene	53703	a	a	a	a	0.018	~~b~~ 0.0038
fluoranthene	206440	3,980	a	a	a	~~b~~ 370[b]	~~b~~ 300[b]
fluorene	86737	a	a	a	a	5,300	~~b~~ 1,300[b]
indeno(1,2,3-cd)pyrene	193395	a	a	a	a	0.018	~~b~~ 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	~~b~~ 960[b]
Polynuclear Aromatic Hydrocarbons, total (PAHs)	a	a	a	a	a	0.0311	0.2
H. ~~Miscellaneous~~ Other Organics (Except Pesticides)............							
di(2-ethylhexyl) adipate	103231	a	a	a	a	a	~~500~~ 400
~~I~~iso~~s~~phorone	78591	117,000	a	a	a	~~b~~ 960	~~b~~ 35
polychlorinated biphenyls, total (PCBs)	a	2	0.014	a	a	0.000064	~~b~~ 0.00017[b]
~~dioxin (~~2,3,7,8-TCDD~~)~~ (dioxin)	1746016	0.01	0.00001	a	a	~~0.000000005~~ 5.0E-9	~~b~~ 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	~~b~~ 0.00013[b]
atrazine (Aatrex)	1912249	170	3	a	a	a	3
bromomethane (methyl bromide)	74839	11,000	a	a	a	1,500	~~b~~ 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	~~b~~ 0.00057[b]
chlorpyrifos	2921882	0.083	0.041	100	a	a	a
2,4-D	94757	a	a	a	a	a	~~100~~ 70
dacthal (DCPA)	1861321	a	14,300	a	a	a	a
dalapon	75990	a	110	a	a	a	200
~~***DDT and Metabolites........***~~							

4,4-DDD (p,p=-DDD)	72548	a	a	a	a	0.00031	~~b~~ 0.00031
4,4-DDE (p,p=-DDE)	72559	1,050	a	a	a	0.00022	~~b~~ 0.00022
DDT, total	50293	1.1	0.001	50	a	~~0.000024~~ 0.00022	~~b~~ 0.00022
diazinon (spectracide)	333415	~~**a**~~ **0.17**	~~0.08~~ 0.17	100	a	a	a
dibromochloropropane (DBCP)	96128	a	a	a	a	15.7	0.2
1,2-dibromoethane	106934	a	a	a	a	a	0.05
dieldrin	60571	0.24	0.056	1	a	0.000054	~~b~~ 0.00014[b]
4,6-dinitro-o-cresol	534521	a	a	a	a	280	~~b~~ 13
dinoseb (DNBP)	88857	a	a	a	a	a	7
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	~~b~~ 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	~~b~~ 89	~~b~~ 62
endothall	145733	a	a	a	a	a	~~110~~ 100
endrin	72208	0.086	0.036	0.5	a	~~0.81~~ 0.060	~~0.76~~ 2
endrin aldehyde	7421934	a	a	a	a	0.3	~~b~~ 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	~~b~~ 0.00021[b]
heptachlor epoxide	1024573	0.52	0.0038	0.1	a	~~b~~ 0.00011[b]	~~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	~~b~~ 0.0039[b]
beta-HCH (beta-BHC)	319857	100	a	a	a	~~b~~ 0.046[b]	~~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	~~0.0625~~ 1.8	~~b~~ 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	~~b~~ 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) ~~oxide~~	56359	~~0.149~~ 0.46	~~0.026~~ 0.072	a	a	a	a
toxaphene	8001352	0.73	0.0002	5	a	0.00028	~~b~~ 0.00073[b]
2,4,5-TP (Silvex)	93721	a	a	a	a	a	~~10~~ 50

a - ~~Criterion not~~ Not available

b - US EPA has promulgated this criterion for Kansas under the Code of Federal Regulations, Title 40, part 131.36. KDHE has not adopted the criterion into the Kansas Surface Water Quality Standards. Nevertheless, the criterion is still applicable to Kansas.

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.