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National Recommended Water Quality Criteria; Notice; Republication

ENVIRONMENTAL PROTECTION AGENCY

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National Recommended Water Quality Criteria; Republication

Editorial Note: FR Doc. 98-30272 was originally published as Part IV (63 FR 67548-67558) in the issue of Monday, December 7, 1998. At the request of the agency, due to incorrect footnote identifiers in the tables, the corrected document is being republished in its entirety.

AGENCY: Environmental Protection Agency (EPA).

ACTION: Compilation of recommended water quality criteria and notice of process for new and revised criteria.

SUMMARY: EPA is publishing a compilation of its national recommended water quality criteria for 157 pollutants, developed pursuant to section 304(a) of the Clean Water Act (CWA or the Act). These recommended criteria provide guidance for States and Tribes in adopting water quality standards under section 303(c) of the CWA. Such standards are used in implementing a number of environmental programs, including setting discharge limits in National Pollutant Discharge Elimination System (NPDES) permits. These water quality criteria are not regulations, and do not impose legally binding requirements on EPA, States, Tribes or the public.

This document also describes changes in EPA's process for deriving new and revised 304(a) criteria. Comments provided to the Agency about the content of this Notice will be considered in future publications of water quality criteria and in carrying out the process for deriving water quality criteria. With this improved process the public will have more opportunity to provide data and views for consideration by EPA. The public may send any comments or observations regarding the compilation format or the process for deriving new or revised water quality criteria to the Agency now, or anytime while the process is being implemented.

ADDRESSES: A copy of the document, "National Recommended Water Quality Criteria" is available from the U.S. EPA, National Center for Environmental Publications and Information, 11029 Kenwood Road, Cincinnati, Ohio 45242, phone (513) 489–8190. The publication is also available electronically at: http://www.epa.gov/ost. Send an original and 3 copies of written comments to W–98–24 Comment Clerk, Water Docket, MC 4104, US EPA, 401 M Street, S.W., Washington, D.C. 20460. Comments may also be submitted electronically to OW-Docket@epamail.epa.gov. Comments should be submitted as a WP5.1, 6.1 or an ASCII file with no form of encryption. The documents cited in the compilation of recommended criteria are available for inspection from 9 to 4 p.m., Monday through Friday, excluding legal holidays, at the Water Docket, EB57, East Tower Basement, USEPA, 401 M St., S.W., Washington, D.C. 20460. For access to these materials, please call (202) 260–3027 to schedule an appointment.

FOR FURTHER INFORMATION CONTACT: Cindy A. Roberts, Health and Ecological Criteria Division (4304), U.S. EPA, 401 M. Street, S.W., Washington, D.C. 20460; (202) 260–2787; roberts.cindy@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

I. What Are Water Quality Criteria?

Section 304(a)(1) of the Clean Water Act requires EPA to develop and publish, and from time to time revise, criteria for water quality accurately reflecting the latest scientific knowledge. Water quality criteria developed under section 304(a) are based solely on data and scientific judgments on the relationship between pollutant concentrations and environmental and human health effects. Section 304(a) criteria do not reflect consideration of economic impacts or the technological feasibility of meeting the chemical concentrations in ambient water. Section 304(a) criteria provide guidance to States and Tribes in adopting water quality standards that ultimately provide a basis for controlling discharges or releases of pollutants. The criteria also provide guidance to EPA when promulgating federal regulations under section 303(c) when such action is necessary.

II. What is in the Compilation Published Today?

EPA is today publishing a compilation of its national recommended water quality criteria for 157 pollutants. This compilation is also available in hard copy at the address given above.

The compilation is presented as a summary table containing EPA's water quality criteria for 147 pollutants, and for an additional 10 pollutants, criteria solely for organoleptic effects. For each set of criteria, EPA lists a **Federal Register** citation, EPA document number or Integrated Risk Information System (IRIS) entry (www.epa.gov/ngispgm3/iris/irisdat). Specific information pertinent to the derivation of individual criteria may be found in cited references. If no criteria are listed for a pollutant, EPA does not have any national recommended water quality criteria.

These water quality criteria are the Agency's current recommended 304(a) criteria, reflecting the latest scientific knowledge. They are generally applicable to the waters of the United States. EPA recommends that States and Tribes use these water quality criteria as guidance in adopting water quality standards pursuant to section 303(c) of the Act and the implementing of federal regulations at 40 CFR part 131. Water quality criteria derived to address site-specific situations are not included; EPA recommends that States and Tribes follow EPA's technical guidance in the "Water Quality Standards Handbook—2nd Edition," EPA, August 1994, in deriving such site-specific criteria. EPA recognizes that in limited circumstances there may be regulatory voids in the absence of State or Tribal water quality standards for specific pollutants. However, States and Tribes should utilize the existing State and Tribal narrative criteria to address such situations; States and Tribes may consult EPA criteria documents and cites in the summary table for additional information.

The national recommended water quality criteria include: previously published criteria that are unchanged; criteria that have been recalculated from earlier criteria; and newly calculated criteria, based on peer-reviewed assessments, methodologies and data, that have not been previously published.

The information used to calculate the water quality criteria is not included in the summary table. Most information has been previously published by the Agency in a variety of sources, and the summary table cites those sources.

When using these 304(a) criteria as guidance in adopting water quality standards, EPA recommends States and Tribes consult the citations referenced in the summary table for additional information regarding the derivation of individual criteria.

The Agency intends to revise the compilation of national recommended water quality criteria from time to time to keep States and Tribes informed as to the most current recommended water quality criteria.

III. How Are National Recommended Water Quality Criteria Used?

Once new or revised 304(a) criteria are published by EPA, the Agency expects States and Tribes to adopt promptly new or revised numeric water quality criteria into their standards consistent with one of the three options

in 40 CFR 131.11. These options are: (1) Adopt the recommended section 304(a) criteria; (2) adopt section 304(a) criteria modified to reflect site-specific conditions; or, (3) adopt criteria derived using other scientifically defensible methods. In adopting criteria under option (2) or (3), States and Tribes must adopt water quality criteria sufficient to protect the designated uses of their waters. When establishing a numerical value based on 304(a) criteria, States and Tribes may reflect site specific conditions or use other scientifically defensible methods. However, States and Tribes should not selectively apply data or selectively use endpoints, species, risk levels, or exposure parameters in deriving criteria; this would not accurately characterize risk and would not result in criteria protective of designated uses.

EPA emphasizes that, in the course of carrying out its responsibilities under section 303(c), it reviews State and Tribal water quality standards to assess the need for new or revised water quality criteria. EPA generally believes that five years from the date of EPA's publication of new or revised water quality criteria is a reasonable time by which States and Tribes should take action to adopt new or revised water quality criteria necessary to protect the designated uses of their waters. This period is intended to accommodate those States and Tribes that have begun a triennial review and wish to complete the actions they have underway, deferring initiating adoption of new or revised section 304(a) criteria until the next triennial review.

IV. What is the Status of Existing Criteria While They Are Under Revision?

The question of the status of the existing section 304(a) criteria often arises when EPA announces that it is beginning a reassessment of existing criteria. The general answer is that water quality criteria published by EPA remain the Agency's recommended water quality criteria until EPA revises or withdraws the criteria. For example, while undertaking recent reassessments of dioxin, PCBs, and other chemicals, EPA has consistently upheld the use of the current section 304(a) criteria for these chemicals and considers them to be scientifically sound until new, peer reviewed, scientific assessments indicate changes are needed. Therefore, the criteria in today's notice are and will continue to be the Agency's national recommended water quality criteria for States and Tribes to use in adopting or revising their water quality standards until superseded by the publication of revised criteria, or withdrawn by notice in the **Federal Register**.

V. What is the Process for Developing New or Revised Criteria?

Section 304(a)(1) of the CWA requires the Agency to develop and publish, and from time to time revise, criteria for water quality accurately reflecting the latest scientific knowledge. The Agency has developed an improved process that it intends to use when deriving new criteria or conducting a major reassessment of existing criteria. The purpose of the improved process is to provide expanded opportunities for public input, and to make the process more efficient.

When deriving new criteria, or when initiating a major reassessment of existing criteria, EPA will take the following steps.

1. EPA will first undertake a comprehensive review of available data and information.

2. EPA will publish a notice in the **Federal Register** and on the Internet announcing its assessment or reassessment of the pollutant. The notice will describe the data available to the Agency, and will solicit any additional pertinent data or views that may be useful in deriving new or revised criteria. EPA is especially interested in hearing from the public regarding new data or information that was unavailable to the Agency, and scientific views as to the application of the relevant Agency methodology for deriving water quality criteria.

3. After public input is received and evaluated, EPA will then utilize information obtained from both the Agency's literature review and the public to develop draft recommended water quality criteria.

4. EPA will initiate a peer review of the draft criteria. Agency peer review consists of a documented critical review by qualified independent experts. Information about EPA peer review practices may be found in the Science Policy Council's Peer Review Handbook (EPA 100-B-98-001, www.epa.gov).

5. Concurrent with the peer review in step four, EPA will publish a notice in the **Federal Register** and on the Internet, of the availability of the draft water quality criteria and solicit views from the public on issues of science pertaining to the information used in deriving the draft criteria. The Agency believes it is important to provide the public with the opportunity to provide scientific views on the draft criteria even though we are not required to invite and respond to written comments.

6. EPA will evaluate the results of the peer review, and prepare a response document for the record in accordance with EPA's Peer Review Handbook. EPA at the same time will consider views provided by the public on issues of science. Major scientific issues will be addressed in the record whether from the peer review or the public.

7. EPA will then revise the draft criteria as necessary, and announce the availability of the final water quality criteria in the **Federal Register** and on the Internet.

VI. What is the Process for Minor Revisions to Criteria?

In addition to developing new criteria, and conducting major reassessments of existing criteria, EPA also from time to time recalculates criteria based on new information pertaining to individual components of the criteria. For example, in today's notice, EPA has recalculated a number of criteria based on new, peer-reviewed data contained in EPA's IRIS. Because such recalculations normally result in only minor changes to the criteria, do not ordinarily involve a change in the underlying scientific methodologies, and reflect peer-reviewed data, EPA will typically publish such recalculated criteria directly as the Agency's recommended water quality criteria. If it appears that a recalculation results in a significant change EPA will follow the process of peer review and public input outlined above. Further, when EPA recalculates national water quality criteria in the course of proposing or promulgating state-specific federal water quality standards pursuant to section 303(c), EPA will offer an opportunity for national public input on the recalculated criteria.

VII. How Does the Process Outlined Above Improve Public Input and Efficiency?

In the past, EPA developed draft criteria documents and announced their availability for public comment in the **Federal Register**. This led to new data and views coming to EPA's attention after draft criteria had already been developed. Responding to new data would sometimes lead to extensive revisions.

The steps outlined above improve the criteria development process in the following ways.

1. The new process is Internet-based which is in line with EPA policy for public access and dissemination of information gathered by EPA. Use of the Internet will allow the public to be more engaged in the criteria development process than previously and to more

knowledgeably follow criteria development. For new criteria or major revisions, EPA will announce its intentions to derive the new or revised criteria on the Internet and include a list of the available literature. This will give the public an opportunity to provide additional data that might not otherwise be identified by the Agency.

2. The public now has two opportunities to contribute data and views, before development and during development, instead of a single opportunity after development.

3. EPA has instituted broader and more formal peer review procedures. This independent scientific review is a more rigorous disciplinary practice to ensure technical improvements in Agency decision making. Previously, EPA used the public comment process outlined above to obtain peer review. The new process allows for both public input and a formal peer review, resulting in a more thorough and complete evaluation of the criteria.

4. Announcing the availability of the draft water quality criteria on the Internet will give the public an opportunity to provide input on issues of science in a more timely manner.

VIII. Where Can I Find More Information About Water Quality Criteria and Water Quality Standards?

For more information about water quality criteria and Water Quality Standards refer to the following: Water Quality Standards Handbook (EPA 823-B94-005a); Advanced Notice of Proposed Rule Making (ANPRM), (63 FR 36742); Water Quality Criteria and Standards Plan—Priorities for the Future (EPA 822-R-98-003); Guidelines and Methodologies Used in the Preparation of Health Effects Assessment Chapters of the Consent Decree Water Criteria Documents (45 FR 79347); Draft Water Quality Criteria Methodology Revisions: Human Health (63 FR 43755, EPA 822-Z-98-001); and Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses (EPA 822/R-85-100); National Strategy for the Development of Regional Nutrient Criteria (EPA 822-R-98-002).

These publications may also be accessed through EPA's National Center for Environmental Publications and Information (NCEPI) or on the Office of Science and Technology's Home-page (www.epa.gov/OST).

IX. What Are the National Recommended Water Quality Criteria?

The following compilation and its associated footnotes and notes presents the national recommended water quality criteria.

NATIONAL RECOMMENDED WATER QUALITY CRITERIA FOR PRIORITY TOXIC POLLUTANTS

Priority pollutant	CAS No.	Freshwater		Saltwater		Human health for consumption of:		FR cite/source
		CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	Water + organism (µg/L)	Organism only (µg/L)	
1 Antimony	7440360					14[B,Z]	4300[B]	57 FR 60848
2 Arsenic	7440382	340[A,D,K]	150[A,D,K]	69[A,D,bb]	36[A,D,bb]			62 FR 42160
						0.018[C,M,S]	0.14[C,M,S]	57 FR 60848
3 Beryllium	7440417					[J,Z]	[J]	62 FR 42160
4 Cadmium	7440439	4.3[D,E,K]	2.2[D,E,K]	42[D,bb]	9.3[D,bb]	[J,Z]	[J]	62 FR 42160
5a Chromium III	16065831	570[D,E,K]	74[D,E,K]					EPA 820/B–96–001
						[J,Z Total]	[J]	62 FR 42160
5b Chromium VI	18540299	16[D,K]	11[D,K]	1,100[D,bb]	50[D,bb]	[J,Z Total]	[J]	62 FR 42160
6 Copper	7440508	13[D,E,K,cc]	9.0[D,E,K,cc]	4.8[D,cc,ff]	3.1[D,cc,ff]	1,300[U]		62 FR 42160
7 Lead	7439921	65[D,E,bb,gg]	2.5[D,E,bb,gg]	210[D,bb]	8.1[D,bb]	[J]	[J]	62 FR 42160
8 Mercury	7439976	1.4[D,K,hh]	0.77[D,K,hh]	1.8[D,ee,hh]	0.94[D,ee,hh]	0.050[B]	0.051[B]	62 FR 42160
9 Nickel	7440020	470[D,E,K]	52[D,E,K]	74[D,bb]	8.2[D,bb]	610[B]	4,600[B]	62 FR 42160
10 Selenium	7782492	[L,R,T]	5.0[I]	290[D,bb,dd]	71[D,bb,dd]			62 FR 42160
						170[Z]	11,000	IRIS 09/01/91
11 Silver	7440224	3.4[D,E,G]		1.9[D,G]				62 FR 42160
12 Thallium	7440280					1.7[B]	6.3[B]	57 FR 60848
13 Zinc	7440666	120[D,E,K]	120[D,E,K]	90[D,bb]	81[D,bb]			62 FR 42160
						9,100[U]	69,000[U]	IRIS 10/01/92
14 Cyanide	57125	22[K,Q]	5.2[K,Q]					EPA 820/B–96–001
				1[Q,bb]	1[Q,bb]	700[B,Z]	220,000[B,H]	57 FR 60848
15 Asbestos	1332214					7 million fibers/L[I]		57 FR 60848
16 2, 3, 7, 8-TCDD Dioxin	1746016					1.3E–8[C]	1.4E–8[C]	62 FR 42160
17 Acrolein	107028					320	780	57 FR 60848
18 Acrylonitrile	107131					0.059[B,C]	0.66[B,C]	57 FR 60848
19 Benzene	71432					1.2[B,C]	71[B,C]	62 FR 42160
20 Bromoform	75252					4.3[B,C]	360[B,C]	62 FR 42160
21 Carbon Tetrachloride	56235					0.25[B,C]	4.4[B,C]	57 FR 60848
22 Chlorobenzene	108907					680[B,Z]	21,000[B,H]	57 FR 60848
23 Chlorodibromomethane	124481					0.41[B,C]	34[B,C]	62 FR 42160
24 Chloroethane	75003							
25 2-Chloroethylvinyl Ether	110758							
26 Chloroform	67663					5.7[B,C]	470[B,C]	62 FR 42160
27 Dichlorobromomethane	75274					0.56[B,C]	46[B,C]	62 FR 42160
28 1,1-Dichloroethane	75343							
29 1,2-Dichloroethane	107062					0.38[B,C]	99[B,C]	57 FR 60848
30 1,1-Dichloroethylene	75354					0.057[B,C]	3.2[B,C]	57 FR 60848
31 1,2-Dichloropropane	78875					0.52[B,C]	39[B,C]	62 FR 42160
32 1,3-Dichloropropene	542756					10[B]	1,700[B]	57 FR 60848
33 Ethylbenzene	100414					3,100[B,Z]	29,000[B]	62 FR 42160
34 Methyl Bromide	74839					48[B]	4000[B]	62 FR 42160
35 Methyl Chloride	74873					[J]	[J]	62 FR 42160
36 Methylene Chloride	75092					4.7[B,C]	1600[B,C]	62 FR 42160
37 1,1,2,2-Tetrachloroethane	79345					0.17[B,C]	11[B,C]	57 FR 60848
38 Tetrachloroethylene	127184					0.8[C]	8.85[C]	57 FR 60848
39 Toluene	108883					6,800[B,Z]	200,000[B]	62 FR 42160
40 1,2-Trans-Dichloroethylene	156605					700[B,Z]	140,000[B]	62 FR 42160
41 1,1,1-Trichloroethane	71556					[J,Z]	[J]	62 FR 42160
42 1,1,2-Trichloroethane	79005					0.60[B,C]	42[B,C]	57 FR 60848
43 Trichloroethylene	79016					2.7[C]	81[C]	57 FR 60848
44 Vinyl Chloride	75014					2.0[C]	525[C]	57 FR 60848
45 2-Chlorophenol	95578					120[B,U]	400[B,U]	62 FR 42160
46 2,4-Dichlorophenol	120832					93[B,U]	790[B,U]	57 FR 60848
47 2,4-Dimethylphenol	105679					540[B,U]	2,300[B,U]	62 FR 42160
48 2-Methyl-4,6-Dinitrophenol	534521					13.4	765	57 FR 60848
49 2,4-Dinitrophenol	51285					70[B]	14,000[B]	57 FR 60848
50 2-Nitrophenol	88755							
51 4-Nitrophenol	100027							
52 3-Methyl-4-Chlorophenol	59507					[U]	[U]	

NATIONAL RECOMMENDED WATER QUALITY CRITERIA FOR PRIORITY TOXIC POLLUTANTS—Continued

Priority pollutant	CAS No.	Freshwater		Saltwater		Human health for consumption of:		FR cite/source
		CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	Water + organism (µg/L)	Organism only (µg/L)	
53 Pentachlorophenol	87865	19[F,K]	15[F,K]	13[bb]	7.9[bb]	0.28[B,C]	8.2[B,C,H]	62 FR 42160
54 Phenol	108952					21,000[B,U]		62 FR 42160
							4,600,000[B,H,U]	57 FR 60848
55 2,4,6-Trichlorophenol	88062					2.1[B,C,U]	6.5[B,C]	62 FR 42160
56 Acenaphthene	83329					1,200[B,U]	2,700[B,U]	62 FR 42160
57 Acenaphthylene	208968							
58 Anthracene	120127					9,600[B]	110,000[B]	62 FR 42160
59 Benzidine	92875					0.00012[B,C]	0.00054[B,C]	57 FR 60848
60 BenzoaAnthracene	56553					0.0044[B,C]	0.049[B,C]	62 FR 42160
61 BenzoaPyrene	50328					0.0044[B,C]	0.049[B,C]	62 FR 42160
62 BenzobFluoranthene	205992					0.0044[B,C]	0.049[B,C]	62 FR 42160
63 BenzoghiPerylene	191242							
64 BenzokFluoranthene	207089					0.0044[B,C]	0.049[B,C]	62 FR 42160
65 Bis2-ChloroethoxyMethane	111911							
66 Bis2-ChloroethylEther	111444					0.031[B,C]	1.4[B,C]	57 FR 60848
67 Bis2-ChloroisopropylEther	39638329					1,400[B]		62 FR 42160
							170,000[B]	57 FR 60848
68 Bis2-EthylhexylPhthalate[X]	117817					1.8[B,C]	5.9[B,C]	57 FR 60848
69 4-Bromophenyl Phenyl Ether	101553							
70 Butylbenzyl Phthalate[W]	85687					3,000[B]	5,200[B]	62 FR 42160
71 2-Chloronaphthalene	91587					1,700[B]	4,300[B]	62 FR 42160
72 4-Chlorophenyl Phenyl Ether	7005723							
73 Chrysene	218019					0.0044[B,C]	0.049[B,C]	62 FR 42160
74 Dibenzoa,hAnthracene	53703					0.0044[B,C]	0.049[B,C]	62 FR 42160
75 1,2-Dichlorobenzene	95501					2,700[B,Z]	17,000[B]	62 FR 42160
76 1,3-Dichlorobenzene	541731					400	2,600	62 FR 42160
77 1,4-Dichlorobenzene	106467					400[Z]	2,600	62 FR 42160
78 3,3'-Dichlorobenzidine	91941					0.04[B,C]	0.077[B,C]	57 FR 60848
79 Diethyl Phthalate[W]	84662					23,000[B]	120,000[B]	57 FR 60848
80 Dimethyl Phthalate[W]	131113					313,000	2,900,000	57 FR 60848
81 Di-n-Butyl Phthalate[W]	84742					2,700[B]	12,000[B]	57 FR 60848
82 2,4-Dinitrotoluene	121142					0.11[C]	9.1[C]	57 FR 60848
83 2,6-Dinitrotoluene	606202							
84 Di-n-Octyl Phthalate	117840							
85 1,2-Diphenylhydrazine	122667					0.040[B,C]	0.54[B,C]	57 FR 60848
86 Fluoranthene	206440					300[B]	370[B]	62 FR 42160
87 Fluorene	86737					1,300[B]	14,000[B]	62 FR 42160
88 Hexachlorobenzene	118741					0.00075[B,C]	0.00077[B,C]	62 FR 42160
89 Hexachlorobutadiene	87683					0.44[B,C]	50[B,C]	57 FR 60848
90 Hexachlorocyclopentadiene	77474					240[B,U,Z]	17,000[B,H,U]	57 FR 60848
91 Hexachloroethane	67721					1.9[B,C]	8.9[B,C]	57 FR 60848
92 Ideno 1,2,3-cdPyrene	193395					0.0044[B,C]	0.049[B,C]	62 FR 42160
93 Isophorone	78591					36[B,C]	2,600[B,C]	IRIS 11/01/97
94 Naphthalene	91203							
95 Nitrobenzene	98953					17[B]	1,900[B,H,U]	57 FR 60848
96 N-Nitrosodimethylamine	62759					0.00069[B,C]	8.1[B,C]	57 FR 60848
97 N-Nitrosodi-n-Propylamine	621647					0.005[B,C]	1.4[B,C]	62 FR 42160
98 N-Nitrosodiphenylamine	86306					5.0[B,C]	16[B,C]	57 FR 60848
99 Phenanthrene	85018							
100 Pyrene	129000					960[B]	11,000[B]	62 FR 42160
101 1,2,4-Trichlorobenzene	120821					260[Z]	940	IRIS 11/01/96
102 Aldrin	309002	3.0[G]		1.3[G]		0.00013[B,C]	0.00014[B,C]	62 FR 42160
103 alpha-BHC	319846					0.0039[B,C]	0.013[B,C]	62 FR 42160
104 beta-BHC	319857					0.014[B,C]	0.046[B,C]	62 FR 42160
105 gamma-BHC (Lindane)	58899	0.95[K]		0.16[G]		0.019[C]	0.063[C]	62 FR 42160
106 delta-BHC	319868							
107 Chlordane	57749	2.4[G]	0.0043[G,aa]	0.09[G]	0.004[G,aa]			62 FR 42160
						0.0021[B,C]	0.0022[B,C]	IRIS 02/07/98

108	4,4'-DDT	50293	1.1 [G]	0.001 [G,aa]	0.13 [G]	0.001 [G,aa]	0.00059 [B,C]	0.00059 [B,C]	62 FR 42160
109	4,4'-DDE	72559					0.00059 [B,C]	0.00059 [B,C]	62 FR 42160
110	4,4'-DDD	72548					0.00083 [B,C]	0.00084 [B,C]	62 FR 42160
111	Dieldrin	60571	0.24 [K]	0.056 [K,O]	0.71 [G]	0.0019 [G,aa]	0.00014 [B,C]	0.00014 [B,C]	62 FR 42160
112	alpha-Endosulfan	959988	0.22 [G,Y]	0.056 [G,Y]	0.034 [G,Y]	0.0087 [G,Y]	110 [B]	240 [B]	62 FR 42160
113	beta-Endosulfan	33213659	0.22 [G,Y]	0.056 [G,Y]	0.034 [G,Y]	0.0087 [G,Y]	110 [B]	240 [B]	62 FR 42160
114	Endosulfan Sulfate	1031078					110 [B]	240 [B]	62 FR 42160
115	Endrin	72208	0.086 [K]	0.036 [K,O]	0.037 [G]	0.0023 [G,aa]	0.76 [B]	0.81 [B,H]	62 FR 42160
116	Endrin Aldehyde	7421934					0.76 [B]	0.81 [B,H]	62 FR 42160
117	Heptachlor	76448	0.52 [G]	0.0038 [G,aa]	0.053 [G]	0.0036 [G,aa]	0.00021 [B,C]	0.00021 [B,C]	62 FR 42160
118	Heptachlor Epoxide	1024573	0.52 [G,Y]	0.0038 [G,Y,aa]	0.053 [G,Y]	0.0036 [G,Y,aa]	0.00010 [B,C]	0.00011 [B,C]	62 FR 42160
119	Polychlorinated Biphenyls			0.014 [N,aa]		0.03 [N,aa]			62 FR 42160
	PCBs						0.00017 [B,C,P]	0.00017 [B,C,P]	63 FR 16182
120	Toxaphene	8001352	0.73	0.0002 [aa]	0.21	0.0002 [aa]	0.00073 [B,C]	0.00075 [B,C]	62 FR 42160

Footnotes:

[A] This recommended water quality criterion was derived from data for arsenic (III), but is applied here to total arsenic, which might imply that arsenic (III) and arsenic (V) are equally toxic to aquatic life and that their toxicities are additive. In the arsenic criteria document (EPA 440/5–84–033, January 1985), Species Mean Acute Values are given for both arsenic (III) and arsenic (V) for five species and the ratios of the SMAVs for each species range from 0.6 to 1.7. Chronic values are available for both arsenic (III) and arsenic (V) for one species; for the fathead minnow, the chronic value for arsenic (V) is 0.29 times the chronic value for arsenic (III). No data are known to be available concerning whether the toxicities of the forms of arsenic to aquatic organisms are additive.

[B] This criterion has been revised to reflect The Environmental Protection Agency's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of April 8, 1998. The fish tissue bioconcentration factor (BCF) from the 1980 Ambient Water Quality Criteria document was retained in each case.

[C] This criterion is based on carcinogenicity of 10^{-6} risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of 10^{-5}, move the decimal point in the recommended criterion one place to the right).

[D] Freshwater and saltwater criteria for metals are expressed in terms of the dissolved metal in the water column. The recommended water quality criteria value was calculated by using the previous 304(a) aquatic life criteria expressed in terms of total recoverable metal, and multiplying it by a conversion factor (CF). The term "Conversion Factor" (CF) represents the recommended conversion factor for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column. (Conversion Factors for saltwater CCCs are not currently available. Conversion factors derived for saltwater CMCs have been used for both saltwater CMCs and CCCs.) See "Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria," October 1, 1993, by Martha G. Prothro, Acting Assistant Administrator for Water, available from the Water Resource center, USEPA, 401 M St., SW, mail code RC4100, Washington, DC 20460; and 40 CFR § 131.36(b)(1). Conversion Factors applied in the table can be found in Appendix A to the Preamble—Conversion Factors for Dissolved Metals.

[E] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. The value given here corresponds to a hardness of 100 mg/L. Criteria values for other hardness may be calculated from the following: CMC (dissolved) = exp $\{m_A [\ln(\text{hardness})]+b_A\}$ (CF), or CCC (dissolved) = exp $\{m_C [\ln(\text{hardness})]+b_C\}$ (CF) and the parameters specified in Appendix B to the Preamble—Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent.

[F] Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMD=exp(1.005(pH) – 4.869); CCC=exp(1.005 (pH) – 5.134). Values displayed in table correspond to a pH of 7.8.

[G] This Criterion is based on 304(a) aquatic life criterion issued in 1980, and was issued in one of the following documents: Aldrin/Dieldrin (EPA 440/5–80–019), Chlordane (EPA 440/5–80–027), DDT (EPA 440/5–80–038), Endosulfan (EPA 440/5–80–046), Endrin (EPA 440/5–80–047), Heptachlor (440/5–80–052), Hexachlorocyclohexane (EPA 440/5–80–054), Silver (EPA 440/5–80–071). The Minimum Data Requirements and derivation procedures were different in the 1980 Guidelines than in the 1985 Guidelines. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

[H] No criterion for protection of human health from consumption of aquatic organisms excluding water was presented in the 1980 criteria document or in the 1986 Quality Criteria for Water. Nevertheless, sufficient information was presented in the 1980 document to allow the calculation of a criterion, even though the results of such a calculation were not shown in the document.

[I] This criterion for asbestos is the Maximum Contaminant Level (MCL) developed under the Safe Drinking Water Act (SDWA).

[J] EPA has not calculated human health criterion for this contaminant. However, permit authorities should address this contaminant in NPDES permit actions using the State's existing narrative criteria for toxics.

[K] This recommended criterion is based on a 304(a) aquatic life criterion that was issued in the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, (EPA–820–B–96–011, September 1996). This value was derived using the GLI Guidelines (60 FR 15393–15399, March 23, 1995; 40 CFR 132 Appendix A); the difference between the 1985 Guidelines and the GLI Guidelines are explained on page iv of the 1995 Updates. None of the decisions concerning the derivation of this criterion were affected by any considerations that are specific to the Great Lakes.

[L] The CMC=1/[(f1/CMC1)=(f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/l and 12.83 µg/l, respectively.

[M] EPA is currently reassessing the criteria for arsenic. Upon completion of the reassessment the Agency will publish revised criteria as appropriate.

[N] PCBs are a class of chemicals which include aroclors, 1242, 1254, 1221, 1232, 1248, 1260, and 1016, CAS numbers 53469219, 11097691, 11104282, 11141165, 12672296, 11096825 and 12674112 respectively. The aquatic life criteria apply to this set of PCBs.

[O] The derivation of the CCC for this pollutant did not consider exposure through the diet, which is probably important for aquatic life occupying upper trophic levels.

[P] This criterion applies to total pcbs, i.e., the sum of all congener or all isomer analyses.

[Q] This recommended water quality criterion is expressed as µg free cyanide (as CN)/L.

[R] This value was announced (61 FR 58444–58449, November 14, 1996) as a proposed GLI 303(c) aquatic life criterion. EPA is currently working on this criterion and so this value might change substantially in the near future.

[S] This recommended water quality criterion refers to the inorganic form only.

[T] This recommended water quality criterion is expressed in terms of total recoverable metal in the water column. It is scientifically acceptable to use the conversion factor of 0.922 that was used in the GLI to convert this to a value that is expressed in terms of dissolved metal.

[U] The organoleptic effect criterion is more stringent than the value for priority toxic pollutants.

[v] This value was derived from data for heptachlor and the criteria document provides insufficient data to estimate the relative toxicities of heptachlor and heptachlor epoxide.

[w] Although EPA has not published a final criteria document for this compound it is EPA's understanding that sufficient data exist to allow calculation of aquatic criteria. It is anticipated that industry intends to publish in the peer reviewed literature draft aquatic life criteria generated in accordance with EPA Guidelines. EPA will review such criteria for possible issuance as national WQC.

[x] There is a full set of aquatic life toxicity data that show that DEHP is not toxic to aquatic organisms at or below its solubility limit.

[y] This value was derived from data for endosulfan and is most appropriately applied to the sum of alpha-endosulfan and beta-endosulfan.

[z] A more stringent MCL has been issued by EPA. Refer to drinking water regulations (40 CFR 141) or Safe Drinking Water Hotline (1–800–426–4791) for values.

[aa] This CCC is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60FR 15393–15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

[bb] This water quality criterion is based on 304(a) aquatic life criterion that was derived using the 1985 Guidelines (Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, PB85–227049, January 1985) and was issued in one of the following criteria documents: Arsenic (EPA 440/5–84–033), Cadmium (EPA 440/5–84–032), Chromium (EPA 440/5–84–029), Copper (EPA 440/5–84–031), Cyanide (EPA 400/5–84–028), Lead (EPA 440/5–84–027), Nickel (EPA 440/5–86–004), Pentachlorophenol (EPA 440/5–86–009), Toxaphene (EPA 440/5–86–006), Zinc (EPA 440/5–87–003).

[cc] When the concentration of dissolved organic carbon is elevated, copper is substantially less toxic and use of Water-Effect Ratios might be appropriate.

[dd] The selenium criteria document (EPA 440/5–87–006), September 1987) provides that if selenium is as toxic to saltwater fishes in the field as it is to freshwater fishes in the field, the status of the fish community should be monitored whenever the concentration of selenium exceeds 5.0 µg/L in salt water because the saltwater CCC does not take into account uptake via the food chain.

[ee] This recommended water quality criterion was derived on page 43 of the mercury criteria document (EPA 440/5–84–026, January 1985). The saltwater CCC of 0.025 µg/L given on page 23 of the criteria document is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60FR15393–15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

[ff] This recommended water quality criterion was derived in Ambient Water Quality Criteria Saltwater Copper Addendum (Draft, April 14, 1995) and was promulgated in the Interim Final National Toxics Rule (60FR22228–222237, May 4, 1995).

[gg] EPA is actively working on this criterion and so this recommended water quality criterion may change substantially in the near future.

[hh] This recommended water quality criterion was derived from data for inorganic mercury (II), but is applied here to total mercury. If a substantial portion of the mercury in the water column is methylmercury, this criterion will probably be under protective. In addition, even though inorganic mercury is converted to methylmercury and methylmercury bioaccumulates to a great extent, this criterion does not account for uptake via the food chain because sufficient data were not available when the criteria was derived.

National Recommended Water Quality Criteria for Non Priority Pollutants

	Non priority pollutant	CAS No.	Freshwater		Saltwater		Human health for consumption of:		FR cite/source
			CMC (µg/L)	CCC (µg/L)	CMC (µg/L)	CCC (µg/L)	Water + organism (µg/L)	Organism only (µg/L)	
1	Alkalinity			20000[F]					Gold Book
2	Aluminum pH 6.5–9.0	7429905	750[G,I]	87[G,J,L]					53 FR 33178
3	Ammonia	7664417	FRESHWATER CRITERIA ARE pH DEPENDENT—SEE DOCUMENT						EPA822–R–98–008
			SALTWATER CRITERIA ARE pH AND TEMPERATURE DEPENDENT[D]						EPA440/5–88–004
4	Aesthetic Qualities		NARRATIVE STATEMENT—SEE DOCUMENT						Gold Book
5	Bacteria		FOR PRIMARY RECREATION AND SHELLFISH USES—SEE DOCUMENT						Gold Book
6	Barium	7440393					1,000[A]		Gold Book
7	Boron		NARRATIVE STATEMENT—SEE DOCUMENT						Gold Book
8	Chloride	16887006	860000[G]	230000[G]					53 FR 19028
9	Chlorine	7782505	19	11	13	7.5	[C]		Gold Book
10	Chlorophenoxy Herbicide 2,4,5,-TP	93721					10[A]		Gold Book
11	Chlorophenoxy Herbicide 2,4-D	94757					100[A,C]		Gold Book
12	Chloropyrifos	2921882	0.083[G]	0.041[G]	0.011[G]	0.0056[G]			Gold Book
13	Color		NARRATIVE STATEMENT—SEE DOCUMENT[F]						Gold Book
14	Demeton	8065483		0.1[F,H]		0.1[F,H]			Gold Book
15	Ether, Bis Chloromethyl	542881					0.00013[E]	0.00078[E]	IRIS 01/01/91
16	Gases, Total Dissolved		NARRATIVE STATEMENT—SEE DOCUMENT[F]						Gold Book
17	Guthion	86500		0.01[F,H]		0.01[F,H]			Gold Book
18	Hardness		NARRATIVE STATEMENT—SEE DOCUMENT						Gold Book
19	Hexachlorocyclo-hexane-Technical	319868					0.0123	0.0414	Gold Book
20	Iron	7439896		1000[F]			300[A]		Gold Book
21	Malathion	121755		0.1[F,H]					Gold Book
22	Manganese	7439965					50[A]	100[A]	Gold Book
23	Methoxychlor	72435		0.03[F,H]		0.03[F,H]	100[A,C]		Gold Book
24	Mirex	2385855		0.001[F,H]		0.001[F,H]			Gold Book
25	Nitrates	14797558					10,000[A]		Gold Book
26	Nitrosamines						0.0008	1.24	

27	Dinitrophenols	25550587					70	14,000	Gold Book
28	Nitrosodibutylamine,N	924163					0.0064 [A]	0.587 [A]	Gold Book
29	Nitrosodiethylamine,N	55185					0.0008 [A]	1.24 [A]	Gold Book
30	Nitrosopyrrolidine,N	930552					0.016	91.9	Gold Book
31	Oil and Grease		NARRATIVE STATEMENT—SEE DOCUMENT [F]						Gold Book
32	Oxygen, Dissolved	7782447	WARMWATER AND COLDWATER MATRIX—SEE DOCUMENT [O]						Gold Book
33	Parathion	56382	0.065 [J]	0.013 [J]					Gold Book
34	Pentachlorobenzene	608935					3.5 [E]	4.1 [E]	IRIS 03/01/88
35	pH			6.5–9 [F]		6.5–8.5 [F,K]	5–9		Gold Book
36	Phosphorus Elemental	7723140				0.1 [F,K]			Gold Book
37	Phosphate Phosphorus		NARRATIVE STATEMENT—SEE DOCUMENT						Gold Book
38	Solids Dissolved and Salinity						250,000 [A]		Gold Book
39	Solids Suspended and Turbidity		NARRATIVE STATEMENT—SEE DOCUMENT [F]						Gold Book
40	Sulfide-Hydrogen Sulfide	7783064		2.0 [F,H]		2.0 [F,H]			Gold Book
41	Tainting Substances		NARRATIVE STATEMENT—SEE DOCUMENT						Gold Book
42	Temperature		SPECIES DEPENDENT CRITERIA—SEE DOCUMENT [M]						Gold Book
43	Tetrachlorobenzene,1,2,4,5-	95943					2.3 [E]	2.9 [E]	IRIS03/01/91
44	Tributyltin TBT		0.46 [N]	0.063 [N]	0.37 [N]	0.010 [N]			62 FR 42554
45	Trichlorophenol,2,4,5-	95954					2,600 [B,E]	9,800 [B,E]	IRIS 03/01/88

Footnotes:

[A] This human health criterion is the same as originally published in the Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value is now published in the Gold Book

[B] The organoleptic effect criterion is more stringent than the value presented in the non priority pollutants table.

[C] A more stringent Maximum Contaminant Level (MCL) has been issued by EPA under the Safe Drinking Water Act. Refer to drinking water regulations 40 CFR 141 or Safe Drinking Water Hotline (1–800–426–4791) for values.

[D] According to the procedures described in the Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, except possibly where a very sensitive species is important at a site, freshwater aquatic life should be protected if both conditions specified in Appendix C to the Preamble—Calculation of Freshwater Ammonia Criterion are satisfied.

[E] This criterion has been revised to reflect The Environmental Protection Agency's q1* or RfD, as contained in the Integrated Risk Information System (IRIS) as of April 8, 1998. The fish tissue bioconcentration factor (BCF) used to derive the original criterion was retained in each case.

[F] The derivation of this value is presented in the Red Book (EPA 440/9–76–023, July, 1976).

[G] This value is based on a 304(a) aquatic life criterion that was derived using the 1985 Guidelines (Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, PB85–227049, January 1985) and was issued in one of the following criteria documents: Aluminum (EPA 440/5–86–008); Chloride (EPA 440/5–88–001); Chloropyrifos (EPA 440/5–86–005).

[H] This CCC is based on the Final Residue Value procedure in the 1985 Guidelines. Since the publication of the Great Lakes Aquatic Life Criteria Guidelines in 1995 (60 FR 15393–15399, March 23, 1995), the Agency no longer uses the Final Residue Value procedure for deriving CCCs for new or revised 304(a) aquatic life criteria.

[I] This value is expressed in terms of total recoverable metal in the water column.

[J] This value is based on a 304(a) aquatic life criterion that was issued in the 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water (EPA–820–B–96–001). This value was derived using the GLI Guidelines (60 FR 15393–15399, March 23, 1995; 40 CFR 132 Appendix A); the differences between the 1985 Guidelines and the GLI Guidelines are explained on page iv of the 1995 Updates. No decision concerning this criterion was affected by any considerations that are specific to the Great Lakes.

[K] According to page 181 of the Red Book: For open ocean waters where the depth is substantially greater than the euphotic zone, the pH should not be changed more than 0.2 units from the naturally occurring variation or any case outside the range of 6.5 to 8.5. For shallow, highly productive coastal and estuarine areas where naturally occurring pH variations approach the lethal limits of some species, changes in pH should be avoided but in any case should not exceed the limits established for fresh water, i.e., 6.5–9.0.

[L] There are three major reasons why the use of Water-Effect Ratios might be appropriate. (1) The value of 87 µg/l is based on a toxicity test with the striped bass in water with pH=6.5–6.6 and hardness <10 mg/L. Data in "Aluminum Water-Effect Ratio for the 3M Plant Effluent Discharge, Middleway, West Virginia" (May 1994) indicate that aluminum is substantially less toxic at higher pH and hardness, but the effects of pH and hardness are not well quantified at this time. (2) In tests with the brook trout at low pH and hardness, effects increased with increasing concentrations of total aluminum even though the concentration of dissolved aluminum was constant, indicating that total recoverable is a more appropriate measurement than dissolved, at least when particulate aluminum is primarily aluminum hydroxide particles. In surface waters, however, the total recoverable procedure might measure aluminum associated with clay particles, which might be less toxic than aluminum associated with aluminum hydroxide. (3) EPA is aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg aluminum/L, when either total recoverable or dissolved is measured.

[M] U.S. EPA. 1973. Water Quality Criteria 1972. EPA–R3–73–033. National Technical Information Service, Springfield, VA.; U.S. EPA. 1977. Temperature Criteria for Freshwater Fish: Protocol and Procedures. EPA–600/3–77–061. National Technical Information Service, Springfield, VA.

[N] This value was announced (62 FR 42554, August 7, 1997) as a proposed 304(a) aquatic life criterion. Although EPA has not responded to public comment, EPA is publishing this as a 304(a) criterion in today's notice as guidance for States and Tribes to consider when adopting water quality criteria.

[O] U.S. EPA. 1986. Ambient Water Quality Criteria for Dissolved Oxygen. EPA 440/5–86–003. National Technical Information Service, Springfield, VA.

NATIONAL RECOMMENDED WATER QUALITY CRITERIA FOR ORGANOLEPTIC EFFECTS

	Pollutant	CAS No.	Organoleptic effect criteria (µg/L)	FR cite/source
1	Acenaphthene	208968	20	Gold Book
2	Monochlorobenzene	108907	20	Gold Book
3	3-Chlorophenol		0.1	Gold Book
4	4-Chlorophenol	106489	0.1	Gold Book
5	2,3-Dichlorophenol		0.04	Gold Book
6	2,5-Dichlorophenol		0.5	Gold Book
7	2,6-Dichlorophenol		0.2	Gold Book
8	3,4-Dichlorophenol		0.3	Gold Book
9	2,4,5-Trichlorophenol	95954	1	Gold Book
10	2,4,6-Trichlorophenol	88062	2	Gold Book
11	2,3,4,6-Tetrachlorophenol		1	Gold Book
12	2-Methyl-4-Chlorophenol		1800	Gold Book
13	3-Methyl-4-Chlorophenol	59507	3000	Gold Book
14	3-Methyl-6-Chlorophenol		20	Gold Book
15	2-Chlorophenol	95578	0.1	Gold Book
16	Copper	744058	1000	Gold Book
17	2,4-Dichlorophenol	120832	0.3	Gold Book
18	2,4-Dimethylphenol	105679	400	Gold Book
19	Hexachlorocyclopentadiene	77474	1	Gold Book
20	Nitrobenzene	98953	30	Gold Book
21	Pentachlorophenol	87865	30	Gold Book
22	Phenol	108952	300	Gold Book
23	Zinc	7440666	5000	45 FR 79341

General Notes:

1. These criteria are based on organoleptic (taste and odor) effects. Because of variations in chemical nomenclature systems, this listing of pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423. Also listed are the Chemical Abstracts Service (CAS) registry numbers, which provide a unique identification for each chemical.

National Recommended Water Quality Criteria

Additional Notes

1. Criteria Maximum Concentration and Criterion Continuous Concentration

The Criteria Maximum Concentration (CMC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed briefly without resulting in an unacceptable effect. The Criterion Continuous Concentration (CCC) is an estimate of the highest concentration of a material in surface water to which an aquatic community can be exposed indefinitely without resulting in an unacceptable effect. The CMC and CCC are just two of the six parts of a aquatic life criterion; the other four parts are the acute averaging period, chronic averaging period, acute frequency of allowed exceedence, and chronic frequency of allowed exceedence. Because 304(a) aquatic life criteria are national guidance, they are intended to be protective of the vast majority of the aquatic communities in the United States.

2. Criteria Recommendations for Priority Pollutants, Non Priority Pollutants and Organoleptic Effects

This compilation lists all priority toxic pollutants and some non priority toxic pollutants, and both human health effect and organoleptic effect criteria issued pursuant to CWA § 304(a). Blank spaces indicate that EPA has no CWA § 304(a) criteria recommendations. For a number of non-priority toxic pollutants not listed, CWA § 304(a) "water + organism" human health criteria are not available but, EPA has published MCLs under the SDWA that may be used in establishing water quality standards to protect water supply designated uses. Because of variations in chemical nomenclature systems, this listing of toxic pollutants does not duplicate the listing in Appendix A of 40 CFR Part 423. Also listed are the Chemical Abstracts Service CAS registry numbers, which provide a unique identification for each chemical.

3. Human Health Risk

The human health criteria for the priority and non priority pollutants are based on carcinogenicity of 10^{-6} risk. Alternate risk levels may be obtained by moving the decimal point (e.g., for a risk level of 10–5, move the decimal point in the recommended criterion one place to the right).

4. Water Quality Criteria Published Pursuant to Section 304(a) or Section 303(c) of the CWA

Many of the values in the compilation were published in the proposed California Toxics Rule (CTR, 62 FR 42160). Although such values were published pursuant to Section 303(c) of the CWA, they represent the Agency's most recent calculation of water quality criteria and thus are published today as the Agency's 304(a) criteria. Water quality criteria published in the proposed CTR may be revised when EPA takes final action on the CTR.

5. Calculation of Dissolved Metals Criteria

The 304(a) criteria for metals, shown as dissolved metals, are calculated in one of two ways. For freshwater metals criteria that are hardness-dependent, the dissolved metal criteria were calculated using a hardness of 100 mg/l as $CaCO_3$ for illustrative purposes only. Saltwater and freshwater metals' criteria that are not hardness-dependent are calculated by multiplying the total recoverable criteria before rounding by the appropriate conversion factors. The final dissolved metals' criteria in the table are rounded to two significant figures. Information regarding the calculation of hardness dependent conversion factors are included in the footnotes.

6. Correction of Chemical Abstract Services Number

The Chemical Abstract Services number (CAS) for Bis(2-Chloroisopropyl) Ether, has been corrected in the table. The correct CAS number for this chemical is 39638-32-9. Previous publications listed 108-60-1 as the CAS number for this chemical.

7. Maximum Contaminant Levels

The compilation includes footnotes for pollutants with Maximum Contaminant Levels (MCLs) more stringent than the recommended water quality criteria in the compilation. MCLs for these pollutants are not included in the compilation, but can be found in the appropriate drinking water regulations (40 CFR 141.11-16 and 141.60-63), or can be accessed through the Safe Drinking Water Hotline (800-426-4791) or the Internet (http://www.epa.gov/ost/tools/dwstds-s.html).

8. Organoleptic Effects

The compilation contains 304(a) criteria for pollutants with toxicity-based criteria as well as non-toxicity based criteria. The basis for the non-toxicity based criteria are organoleptic effects (e.g., taste and odor) which would make water and edible aquatic life unpalatable but not toxic to humans. The table includes criteria for organoleptic effects for 23 pollutants. Pollutants with organoleptic effect criteria more stringent than the criteria based on toxicity (e.g., included in both the priority and non-priority pollutant tables) are footnoted as such.

9. Category Criteria

In the 1980 criteria documents, certain recommended water quality criteria were published for categories of pollutants rather than for individual pollutants within that category. Subsequently, in a series of separate actions, the Agency derived criteria for specific pollutants within a category. Therefore, in this compilation EPA is replacing criteria representing categories with individual pollutant criteria (e.g., 1,3-dichlorobenzene, 1,4-dichlorobenzene and 1,2-dichlorobenzene).

10. Specific Chemical Calculations

A. Selenium

(1) Human Health

In the 1980 Selenium document, a criterion for the protection of human health from consumption of water and organisms was calculated based on a BCF of 6.0 L/kg and a maximum water-related contribution of 35 µg Se/day. Subsequently, the EPA Office of Health and Environmental Assessment issued an errata notice (February 23, 1982), revising the BCF for selenium to 4.8 L/kg. In 1988, EPA issued an addendum (ECAO-CIN-668) revising the human health criteria for selenium. Later in the final National Toxic Rule (NTR, 57 FR 60848), EPA withdrew previously published selenium human health criteria, pending Agency review of new epidemiological data.

This compilation includes human health criteria for selenium, calculated using a BCF of 4.8 L/kg along with the current IRIS RfD of 0.005 mg/kg/day. EPA included these recommended water quality criteria in the compilation because the data necessary for calculating a criteria in accordance with EPA's 1980 human health methodology are available.

(2) Aquatic Life

This compilation contains aquatic life criteria for selenium that are the same as those published in the proposed CTR. In the CTR, EPA proposed an acute criterion for selenium based on the criterion proposed for selenium in the Water Quality Guidance for the Great Lakes System (61 FR 58444). The GLI and CTR proposals take into account data showing that selenium's two most prevalent oxidation states, selenite and selenate, present differing potentials for aquatic toxicity, as well as new data indicating that various forms of selenium are additive. The new approach produces a different selenium acute criterion concentration, or CMC, depending upon the relative proportions of selenite, selenate, and other forms of selenium that are present.

EPA notes it is currently undertaking a reassessment of selenium, and expects the 304(a) criteria for selenium will be revised based on the final reassessment (63 FR 26186). However, until such time as revised water quality criteria for selenium are published by the Agency, the recommended water quality criteria in this compilation are EPA's current 304(a) criteria.

B. 1,2,4-Trichlorobenzene and Zinc

Human health criteria for 1,2,4-trichlorobenzene and zinc have not been previously published. Sufficient information is now available for calculating water quality criteria for the protection of human health from the consumption of aquatic organisms and the consumption of aquatic organisms and water for both these compounds. Therefore, EPA is publishing criteria for these pollutants in this compilation.

C. Chromium (III)

The recommended aquatic life water quality criteria for chromium (III) included in the compilation are based on the values presented in the document titled: 1995 Updates: Water Quality Criteria Documents for the Protection of Aquatic Life in Ambient Water, however, this document contains criteria based on the total recoverable fraction. The chromium (III) criteria in this compilation were calculated by applying the conversion factors used in the Final Water Quality Guidance for the Great Lakes System (60 FR 15366) to the 1995 Update document values.

D. Ether, Bis (Chloromethyl), Pentachlorobenzene, Tetrachlorobenzene 1,2,4,5- Trichlorophenol

Human health criteria for these pollutants were last published in EPA's Quality Criteria for Water 1986 or "Gold Book". Some of these criteria were calculated using Acceptable Daily Intake (ADIs) rather than RfDs. Updated q1*s and RfDs are now available in IRIS for ether, bis (chloromethyl), pentachlorobenzene, tetrachlorobenzene 1,2,4,5-, and trichlorophenol, and were used to revise the water quality criteria for these compounds. The recommended water quality criteria for ether, bis (chloromethyl) were revised using an updated q1*, while criteria for pentachlorobenzene, and tetrachlorobenzene 1,2,4,5-, and trichlorophenol were derived using an updated RfD value.

E. PCBs

In this compilation EPA is publishing aquatic life and human health criteria based on total PCBs rather than individual arochlors. These criteria replace the previous criteria for the seven individual arochlors. Thus, there are criteria for a total of 102 of the 126 priority pollutants.

Dated: October 26, 1998.

J. Charles Fox,

Assistant Administrator, Office of Water.

Appendix A—Conversion Factors for Dissolved Metals

Metal	Conversion factor freshwater CMC	Conversion factor freshwater CCC	Conversion factor saltwater CMC	Conversion factor saltwater CCC
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.138672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860		
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Mercury	0.85	0.85	0.85	0.85
Nickel	0.998	0.997	0.990	0.990
Selenium			0.998	0.998
Silver	0.85		0.85	
Zinc	0.978	0.986	0.946	0.946

Appendix B—Parameters for Calculating Freshwater Dissolved Metals Criteria That Are Hardness-Dependent

Chemical	m_A	b_A	m_C	b_C	Freshwater conversion factors (CF)	
					Acute	Chronic
Cadmium	1.128	−3.6867	0.7852	−2.715	1.136672-[ln (hardness)(0.041838)]	1.101672-[ln (hardness)(0.041838)]
Chromium III	0.8190	3.7256	0.8190	0.6848	0.316	0.860
Copper	0.9422	−1.700	0.8545	−1.702	0.960	0.960
Lead	1.273	−1.460	1.273	−4.705	1.46203-[ln (hardness)(0.145712)]	1.46203-[ln (hardness)(0.145712)]
Nickel	0.8460	2.255	0.8460	0.0584	0.998	0.997
Silver	1.72	−6.52			0.85	
Zinc	0.8473	0.884	0.8473	0.884	0.978	0.986

Appendix C—Calculation of Freshwater Ammonia Criterion

1. The one-hour average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CMC calculated using the following equation:

$$CMC = \frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$$

In situations where salmonids do not occur, the CMC may be calculated using the following equation:

$$CMC = \frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$$

2. The thirty-day average concentration of total ammonia nitrogen (in mg N/L) does not exceed, more than once every three years on the average, the CCC calculated using the following equation:

$$CCC = \frac{0.0858}{1+10^{7.688-pH}} + \frac{3.70}{1+10^{pH-7.688}}$$

Editorial Note: FR Doc. 98-30272 was originally published as Part IV (63 FR 67548-67558) in the issue of Monday, December 7, 1998. At the request of the agency, due to incorrect footnote identifiers in the tables, the corrected document is being republished in its entirety.

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