



Chromium

Water Quality Standards Criteria Digest A Compilation of State/Federal Criteria



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**NATIONAL SUMMARY
OF
STATE WATER QUALITY STANDARDS
GENERAL TOXIC SUBSTANCES PROVISIONS**

JULY, 1980

**PREPARED FOR
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Introduction

This digest was compiled to provide general information to the public as well as to Federal, State, and local officials. It contains excerpts from the individual State-Federal water quality standards establishing pollutant specific criteria for navigable surface waters. The water quality standards program is implemented by the U.S. Environmental Protection Agency where responsibility for providing water quality recommendations, approving State-adopted standards for navigable waters, evaluating adherence to the standards, and overseeing enforcement of standards compliance, has been mandated by Congress.

The standards program, a nationwide strategy for surface water quality management, contains two major elements: the use (recreation, drinking water, fish and wildlife propagation, industrial, or agricultural) to be made of the navigable water; and criteria to protect these uses.

Water quality criteria (numerical or narrative specifications for physical, chemical, temperature, and biological constituents are stated in the July 1976 U.S. Environmental Protection Agency publication Quality Criteria for Water (QCW), order # 055-001-01049-4, price \$3.50, available from the Government Printing Office, Washington, D.C. The 1976 QCW, commonly referred to as the "Red Book," is the most current compilation of scientific information used by the Agency as a basis for assessing water quality. This publication is subject to periodic updating and revisions in light of new scientific and technical information.

Chromium is an element rarely found in natural waters. It has oxidation states ranging from Cr^{-2} to Cr^{+6} , of which the trivalent form is most commonly found in nature. Chromium salts, primarily chromates and dichromates, are used extensively in metal finishing, textile, and leather tanning industries. They are also used in pigments, fungicides, and wood preservatives.

Chromium has been shown to be an essential trace element for humans even though it has been shown to be toxic in some instances. Chromium has been found to produce toxic effects in aquatic life when in relatively high concentrations.

The 1976 Quality Criteria for Water recommends the following:

- 50 ug/l (total) for domestic water supply (health)
- 100 ug/l (total) for freshwater aquatic life.

Since water quality standards are revised from time to time, following procedures set forth in the Clean Water Act, individual entries in this digest may be superseded. This digest will be updated periodically. Because this publication is intended for use only as a general information reference, the reader needs to refer to the current approved water quality standards to obtain the latest information for special purposes and applications. These can be obtained from the State water pollution control agencies or the EPA Regional Offices.

REFERENCES

- A California Water Quality Standards by River Basins, c.a. 1975
For more detailed information on selected basins, sub-basins and stretches of streams and coastal areas refer to California State Water Quality Standards.
- B Delaware Water Quality Standards, March 25, 1979
- C Idaho Water Quality Standards, c.a. September, 1979
- D Missouri Water Quality Standards, c.a. February, 1978
- E American Samoa Water Quality Standards,
Revised July, 1973
- F Territory of Guam Water Quality Standards, Sept. 1975
- G Trust Territory of the Pacific Islands Water Quality
Standards, October 21, 1973
- H Virgin Islands Water Quality Standards, Aug. 1973

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- 1 Pages 701:0501-0509, February 16, 1979
- 2 Pages 706:1004-1008, July 20, 1979
- 3 Pages 711-0542-0544, August 5, 1977
- 4 Pages 716:0603, March 26, 1976
- 5 Pages 726-:1005, 1011-1013, March 7, 1980
Basic Water Quality Standards adopted May 22, 1979,
have not yet been submitted to EPA for formal approval.
- 6 Pages 731:1002-1009, September 8, 1978
- 7 Pages 746:1008-1014, October 19, 1979
- 8 Pages 751:0504-0505, January 25, 1980
- 9 Pages 765:0512-0515, January 30, 1976
- 10 Page 761:0503-0504, 1973

- 11 Page 766:0504-0509, October 5, 1979
- 12 Pages 771:0502-0504, September 29, 1978
- 13 Pages 776:0504-0506, April 10, 1979
- 14 Pages 781:0501-0502, May 18, 1979
- 15 Pages 786:0501-0502, August 29, 1975
- 16 Page 791:0583, May 26, 1978
- 17 Pages 796:0103-0108, February 16, 1979
- 18 Pages 801:1001-1002, Sept. 29, 1978
- 19 Page 806:1003, March 30, 1979
- 20 Page 811:1043, 1974
- 21 Pages 816:0602-0607, 0642-0648, 1974
- 22 Pages 821:0502-0505, June 30, 1978
- 23 Pages 831:0501-0510, February 21, 1975
- 24 Page 836:0502, June 30, 1978
- 25 Pages 841:0507-0537, December 7, 1979
- 26 Pages 846:0501-0508, November 17, 1978
- 27 Pages 851:1001-1023, December 15, 1978
- 28 Pages 856:1001-1002, July 18, 1978
- 29 Pages 861:1002-1007, August 11, 1979
- 30 Pages 866:1004-1009, December 28, 1979
- 31 Pages 871:0501-0506, November 25, 1977
- 32 Pages 876-1001-1043, May 26, 1978
- 33 Pages 881:1001-1007, September 21, 1979
- 34 Pages 886:0513-0524, August 29, 1975
- 35 Pages 891:1001-1129, November 16, 1979

- 36 Pages 901:0501-0505, November 3, 1978
- 37 Pages 906:0501:0506, October 13, 1978
- 38 Pages 911:0501-0507, June 22, 1979
- 39 Pages 916:0541-0544, April 14, 1978
- 40 Pages 921:1001-1003, August 13, 1976
- 41 Pages 926:0541-0563, January 26, 1979
- 42 Pages 931:0501-0508, May 26, 1978
- 43 Pages 936:1001-1003, June 27, 1975
- 44 Pages 941:1001-1005, May 26, 1978
- 45 Pages 946:0501-0520, July 14, 1978
- 46 Pages 951:1002-1003, April 28, 1978
- 47 Pages 956:1001-1007, January 11, 1980
- 48 Page 741:1002, November 23, 1979
- 49 Pages 896:0301-0310, March 31, 1978

CHROMIUM

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Alabama ^{1.}	Not Specified	All
	Toxic Substances narrative: only such amounts, whether alone or in combination with other substances as will not render the waters unsafe or unsuitable as a source of water supply for drinking or food-processing purposes, or injurious to fish, wildlife and aquatic life.	Public water supply
	Toxic Substances narrative: only such amounts, whether alone or in combination with other substances or wastes, as will not: render the water unsafe or unsuitable for swimming and water-contact sports; be injurious to fish, wildlife and aquatic life or, where applicable, shrimp and crabs; impair the waters for any other usage established for this classification.	Swimming and other whole body water-contact sports
	Toxic substances narrative: Only such amounts, whether alone or in combination with other substances, as will not: be injurious to fish and aquatic life, including shrimp and crabs; exceed one-tenth of the 96-hour median tolerance limit for fish, aquatic life or shellfish, including shrimp and crabs.	Shellfish harvesting
	Toxic Substances narrative: Only such amounts, whether alone or in combination with other substances, as will not: be injurious to fish and aquatic life including shrimp and crabs in estuarine or salt waters or the propagation thereof; not to exceed one-tenth of the 96-hour median tolerance limit for fish and aquatic life including shrimp and crabs in salt and estuarine waters except that other limiting concentrations may be used when factually justified and approved by the Commission.	Fish and wildlife
	Only such amounts as will not render the waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, industrial process water supply purposes, and fish survival, nor interfere with downstream uses.	Agricultural and industrial water supply

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Alabama (con't)	Only such amounts as will not render the waters unsuitable for industrial cooling and industrial process water supply purposes, nor interfere with downstream water uses. Only such amounts as will not render the waters unsuitable for agricultural irrigation, livestock watering, industrial cooling, and industrial process water supply purposes, where applicable nor interfere with downstream water use.	Industrial operations Navigation
Alaska ^{2.}	Not specified Toxic substances narrative: shall not exceed <u>Alaska Drinking Water Standards</u> or EPA <u>Quality Criteria for Water</u>. Toxic substances narrative: same as I. (A) (i) where contact with a product destined for subsequent human consumption is present. Same as I. (C) or FWPCA <u>Water Quality Criteria</u> as applicable to substances for stockwaters. Concentrations for irrigation waters shall not exceed FWPCA <u>Water Quality Criteria</u> or <u>WQC 1972</u>. Toxic substances narrative: shall not individually or in combination exceed 0.01 times the lowest measured 96-hour LC₅₀ for life stages of species identified by the department as being the most sensitive, biologically important to the situation or exceed criteria cited in EPA <u>Quality Criteria for Water</u> or <u>Alaska Drinking Water Standards</u> whichever concentration is less. Toxic substances narrative: substances shall not be present which pose hazards to worker contact.	All I. Fresh water (A) water supply (i) drinking, culinary and food processing (ii) agriculture, including irrigation and stock watering (iii) aquaculture (iv) industrial, including any water supplies used in association with a manufacturing or production enterprise other than food processing), including mining, placer mining, energy production or development

ate

aska
(con't)

Criteria Value in mg/l

Designated Stream Use

Toxic substances narrative: same as I. (A) (i.)

(B) water recreation
(i) contact recreation.

Toxic substances narrative: substances shall not be present which pose hazards to incidental human contact.

(ii) secondary recreation

Toxic substances narrative: shall not individually or in combination exceed 0.01 times the lowest measured 96 hour LC₅₀ for life stages of species identified by the department as being the most sensitive, biologically important to the location, or exceed criteria cited in EPA Quality Criteria for Water or Alaska Drinking Water Standards whichever concentration is less.

(C) growth and propagation of fish, shellfish, other aquatic life, and wildlife including waterfowl and furbearers

Toxic substances narrative: same as I. (A) (iii).

II. Marine water

(A) water supply
(i) aquaculture

Toxic substances narrative: shall not exceed EPA Quality Criteria for Water as applicable to the substance.

(ii) seafood processing

Toxic substances narrative: same as I. (A) (iv).

(iii) industrial, including any water supplies used in association with a manufacturing or production enterprise (other than food processing) including mining, placer mining, energy production or development

Toxic substances narrative: same as II. (A) (ii).

(B) water recreation

(i) contact recreation

Toxic substances narrative: same as I. (B) (ii).

(ii) secondary recreation

Toxic substances narrative: same as I. (C).

(C) growth and propagation of fish, shellfish, aquatic life, and wildlife including seabirds, waterfowl and furbearers

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Alaska (con't)	Toxic substances narrative: same as I. (C) but excluding the phrase " <u>or Alaska Drinking Water Standards.</u> "	(D) harvesting for consumption of raw mollusks or other raw aquatic life
Arizona ³	0.05 (Hexavalent)	Domestic, industrial, recreation, aesthetic, fish, aquatic life and wildlife
	Toxic substances narrative: Toxic substances shall be kept below levels which are deleterious to human, animal, plant or aquatic life, or in amounts sufficient to interfere with the beneficial use of the water. As a minimum evaluation for the presence of toxic substances, a water shall be evaluated by use of a 96-hour bioassay, guided by the document <u>Standard Methods for the Examination of Water and Wastewater</u> . The survival of the test organisms shall not be less than that in controls which utilize appropriate experimental water.	All
Arkansas ⁴	Not specified	All
	Toxic substances narrative: Toxic materials attributable to municipal, industrial, agricultural, or other waste discharges, shall not be present in receiving waters in such quantities as to be toxic to human, animal, plant or aquatic life or to interfere with the normal propagation of aquatic life. For any toxicants, concentrations in the receiving waters after mixing shall not exceed 0.01 of the 96-hour TL_m , unless they can be shown to be non-persistent and noncumulative, and to exhibit no synergistic interactions with other waste or stream components. In no case shall concentrations exceed 0.05 of the 96-hour TL_m .	All
California ^A	0.05	Domestic Water Supply
	1.0	Agricultural uses in Basin 2 only
	0.002 - 6-month Median	Ocean waters only
	0.008 - Daily Maximum	
	0.02 - Instantaneous Maximum	

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
California (con't)	All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Regional Board. The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary for other control water that is consistent with the requirements for "experimental water" as described in "Standard Methods for the Examination of Water and Wastewater", latest edition. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay. In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.	All
Colorado ⁵	0.1 (Trivalent) 0.025 (Hexavalent) 0.05 (Trivalent and Hexavalent) 0.1 (Trivalent and Hexavalent) Toxic substances narrative: Substances attributable to human-induced discharges not otherwise controlled by permits, BMP's, or plans of operation approved by the Division, shall not be introduced into the waters of the State...in amounts, con-	All except domestic water supply and agricultural Domestic water supply Agricultural All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Colorado (con't)	centrations, or combinations which are... toxic to humans, animals, plants, or aqua- tic life.	
Connecticut ⁶	Not specified	All
	Toxic substances narrative: Note 4. The waters shall be free from chemical cons- tituents in concentrations or combinations which would be harmful to human, animal or aquatic life for the most sensitive and governing water use class. Criteria for chemical constitutes contained in the <u>Quality Criteria for Water (EPA)</u> shall be considered and used as guidance. In areas where fisheries are the governing conside- rations and approved limits have not been established, bioassays are necessary to establish limits on toxic substances, the recommendations for bioassay procedures contained in "Standard Methods for the Examination of Water and Wastewater" and the application factors contained, in <u>Quality Criteria for Water (EPA)</u> shall be considered. For public drinking water supplies, the raw water sources must be of such a quality that EPA limits as defined by the Safe Drinking Water Act (PL 93-523), or state limits if more strin- gent, for finished water can be met after conventional treatment.	All
	Toxic substances narrative: None in con- centrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters un- safe or unsuitable for fish or shellfish or their propagation or impair the waters for any other uses. (See Note 4. above).	Coastal and marine water uses
Delaware ^B	Not specified	All
	Toxic substances narrative: None in con- centrations harmful (synergistically or otherwise) to humans, fish, wildlife and aquatic life as prescribed by EPA's <u>Quality Criteria for Water, 1976.</u>	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Florida ⁷	0.05	All
	Minimum criteria for all waters at all times at all places: shall be free from domestic, industrial, agricultural, or other man-induced non-thermal components of discharges which, alone or in combination with other components of discharges (whether thermal or non-thermal) are acutely toxic; or are present in concentrations which are carcinogenic, mutagenic, or teratogenic to human beings or to significant locally occurring, wildlife or aquatic species; or pose a serious danger to the public health, safety, or welfare.	All
	General criteria for toxic substances (applied to all surface waters except within zones of mixing): substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, animals, or plants - none shall be present.	All
Georgia ⁸	Not specified	All
	Toxic substances narrative: No material or substance in such concentration that, after treatment, would exceed the requirements of the Environmental Protection Division and the latest edition of the Federal Drinking Water Standards.	Drinking water supplies
	Toxic wastes narrative: None in concentrations that would harm man, fish and game or other beneficial aquatic life.	Recreation; fishing, propagation of fish, shellfish, game and other aquatic life
	Toxic substance narrative: None in concentrations that would prevent fish survival.	Agricultural: industrial; navigation
	Toxic substances narrative: Free from toxic substances discharged from municipalities, industries or other sources in amounts, concentrations or combinations which are harmful to humans, animals or aquatic life.	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Hawaii ⁹	Not specified Toxic substances narrative: All waters shall be free of substances attributable to domestic, industrial, or other controllable sources as follows: toxic substances at levels or combinations sufficient to be toxic or harmful to human, animal, plant or aquatic life or in amounts sufficient to interfere with any beneficial use of the water. As a minimum, evaluation by use of a 96-hour bioassay described in the most recent edition of <u>Standard Methods for the Examination of Water and Wastewater</u> shall be conducted. Survival of test organisms shall not be less than that in controls which utilize appropriate experimental water.	All All
Idaho ¹⁰	Not specified 0.05 The following general water quality standards will apply to waters of the State, both surface and underground, in addition to the water quality standards set forth for specifically classified waters. Manual Sections 1-2200.04 —1-2200.06 will, however, apply only to surface waters. As a result of man-caused point or nonpoint source discharge, waters of the State must not contain: (1-30-80) .01 <u>Hazardous Materials.</u> Hazardous materials (see Manual Section 1-2003.17) in concentrations found to be of public health significance or to adversely affect designated or protected beneficial uses. (1-30-80) .02 <u>Deleterious Materials:</u> Deleterious materials (see Manual Section 1-2003.06) in concentrations that impair designated or protected beneficial uses without being hazardous. (1-30-80)	All Domestic Water Supplies

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Illinois ¹¹	0.05 Hexavalent	All
	1.0 Trivalent	All
	Waters shall meet the following standard at any point at which water is withdrawn: water shall be of such quality that with treatment consisting of coagulation, sedimentation, filtration, storage and chlorination, or other equivalent treatment processes, the treated water shall meet in all respects 0.05 (Raw and Treated)	Public and food processing water supply
	0.3 Hexavalent	Secondary contact and indigenous aquatic life
Indiana ¹²	Toxic substances narrative: Freedom from matter in concentrations or combinations toxic to human, animal, plant or aquatic life of other than national origin. Any substance toxic to aquatic life shall not exceed 0.1 of the 96-hour TLm for native fish or essential fish food organisms.	All
	Not Specified	All
	0.05 - Lake Michigan and Contiguous Harbor Areas	Whole Body Contact, Aquatic life, Domestic water supply, industrial water supply
	Toxic substances narrative: free from substances attributable to municipal, industrial, agricultural, and other land use practices or other discharges which are in amounts sufficient to be toxic to humans, animals, aquatic life or plants. As a guideline, toxic substances should be limited to the 96-hour median lethal concentration (LC50) for biota significant to the indigenous aquatic community.	All
	Toxic substances narrative: shall not exceed 0.1 of the 96-hour median lethal concentration for important indigenous aquatic species. More stringent application factors shall be used when justified. Concentrations of organic contaminants	Aquatic life; fish

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Indiana (con't)	which can be demonstrated to be persistent, to have a tendency to bioconcentrate in the aquatic biota, and are likely to be toxic on the basis of available scientific evidence, shall be limited as determined by the Board. Toxic substances narrative: shall not be present after conventional treatment in such levels as to prevent meeting the Drinking Water Standards adopted by the Indiana State Board of Health or by the Indiana Environmental Management Board.	Potable supply
Iowa ¹³	0.05 (Total Hexavalent) Toxic substances narrative: All waters, at all times, at all places shall be free from substances attributable to wastewater discharges or agricultural practices in concentrations or combinations which are toxic or harmful to human, animal, or plant life. Toxic substances narrative: all substances toxic or detrimental to aquatic life shall be limited to non-toxic or non-detrimental concentrations in surface waters. Toxic substances narrative: all substances toxic to humans shall be limited to non-toxic concentrations.	Wildlife, fish, aquatic and semiaquatic life, secondary contact, potable water supply All Wildlife, fish, aquatic and semiaquatic life and secondary contact Potable water supply
Kansas ¹⁴	Not specified General criteria: the individual and cumulative effect of waste discharges to waters shall be guided by both the primary and secondary drinking water regulations (40 CFR 141) and EPA criteria for water quality. Pollutational substances contributed by man-made sources shall be controlled so that all waters are free from public health hazards or nuisance conditions at all times.	All All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Kansas (con't)	Toxic substances narrative: Toxic substances or toxic synergistic effects of substances from man-made sources shall be limited to concentrations in the receiving water that will not be harmful to animal, plant or aquatic life.	All
Kentucky ¹⁵	0.1	Warmwater Aquatic habitat
	0.05	Domestic water supply
	Surface waters shall not be aesthetically or otherwise degraded by substances that injure, be toxic to or produce adverse physiological or behavioral responses in humans, fish, shellfish, and aquatic life.	All
	The allowable instream concentration of toxic substances, including pesticides, shall not exceed 0.01 of the 96-hour median lethal concentration (LC ₅₀) or 0.1 of the 96-hour LC ₅₀ for noncumulative and nonpersistent toxic materials using a representative indigenous aquatic organism.	Warmwater aquatic habitat
Louisiana ¹⁶	Not specified	All
	Toxic substances narrative: free from such concentrations of substances attributable to waste water or other discharges sufficient to injure or are toxic or produce adverse physiological response in humans, animals, fish, shellfish, wildlife, or plants.	All
	Shall not be present in quantities that alone or in combination will be toxic to animal or plant life. In all cases the level shall not exceed the TLm 96/10. Bioassay techniques will be used in evaluating toxicity utilizing methods and species of test organisms suitable to the purpose at hand.	
	Toxic substances shall not exceed the levels established by the USPHS drinking water standards latest edition.	Public water supply

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Maine ¹⁷	Prohibited	All
	50 ug/l	Class B
	Toxic substances narrative: no waste substances containing chemical constituents which would be harmful to humans, animal or aquatic life.	All
Maryland ¹⁸	Not specified	All
	Toxic substances narrative: at all times free from toxic substances attributable to sewage, industrial waste, or other waste in concentrations or combinations which are harmful to human, animal, plant or aquatic life.	All
Massachusetts ¹⁹	Not specified	All
	Toxic substances narrative: free from pollutants in concentrations or combinations that are toxic to humans or aquatic life.	All
	For each class, the most sensitive beneficial uses are identified and minimum criteria for water quality in the water column are established. The minimum criteria in Reg. 3.4 have been developed by applying the criteria contained in the EPA publication <u>Quality Criteria for Water</u> (EPA-440/9-76-023) to account for local conditions including, but not limited to:	
	(a) The characteristics of the biological community	
	(b) Temperature, weather and flow characteristics, and	
	(c) Synergistic and antagonistic effects of combinations of pollutants.	
	The Division will use the EPA publication entitled <u>Quality Criteria for Water</u> , EPA-440/9-76-023 as guidance in establishing case-by-case discharge limits for	

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Massachusetts (con't)	pollutants not specifically listed in these standards but included under the heading "Other Constituents" in Regulation 3.4, for identifying bioassay application factors and for interpretations of narrative criteria. Where the minimum criteria specifically listed by a Division in this part differ from those contained in the federal criteria, the provisions of the specifically listed criteria in these standards shall apply.	
Michigan ²⁰	Not Specified.	All
	Toxic substances narrative: (1) toxicity of undefined toxic substances not included in (2) and (3) below shall be determined by development of 96-hour TLm's or other appropriate effect end points obtained by continuous-flow or in situ bioassays using suitable test organisms. Shall not exceed safe concentrations as determined by applying an application factor, based on knowledge of behavior of toxic substances and organisms to be protected, to the TLm or other appropriate effect end point.	All
	(2) defined toxic substances shall be limited by application of recommendations contained in the chapter on Fresh-water Organisms, <u>Report of the NTAC to Secretary of the Interior, WQC, 1968</u> , or by application of any toxic effluent standard, limitation or prohibition promulgated by EPA pursuant to section 307(a) of PL92-500, whichever is more restrictive.	All
	(3) shall not exceed the permissible inorganic chemicals criteria for raw public water supply in <u>Report of the NTAC to Secretary of the Interior, WQC, 1968</u> .	Public water supply
Minnesota ²¹	0.05 (Hexavalent)	Domestic (Classes A, B, C & D); Fisheries and recreation (Classes B & C)
	0.02	Fisheries and recreation (Class A)

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Minnesota (con't)	96-hour TLM for indigenous fish and fish food organisms should not be exceeded at any point in the mixing zone.	All
	Toxic substances narrative: none at levels acutely toxic to humans or other animals or plant life.	All
	Toxic substances narrative: none at levels harmful either directly or indirectly.	Agriculture and wildlife (Class B)
Mississippi ²²	0.05	Public Water Supply
	Toxic substances narrative: free from substances attributable to municipal, industrial, agricultural or other discharges in concentrations or combinations which are toxic to humans, animal or other aquatic life.	All
	Toxic substances narrative: the concentration of toxic pollutants shall not exceed 0.1 of the 96-hour TLM based on available data.	Shellfish Harvesting Recreation, fish and wildlife.
Missouri ^D	0.01	Aquatic life, irrigation
	0.05	Drinking water supply
	All waters, at all times shall be free from substances or conditions that have a harmful effect on human, animal, or aquatic life.	
Montana ²³	Not specified	All
	Toxic substances narrative: free from substances attributable to municipal, industrial, agricultural practices or other discharges that will create concentrations or combinations of materials which are toxic to human, animal, plant or aquatic life.	All
	Toxic substances narrative: no increases above naturally occurring concentrations are allowed.	Water supply (Class A-Closed)

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Montana (con't)	Toxic substances narrative: concentrations of toxic substances after treatment for domestic use are not to exceed recommended limits in latest EPA drinking water standards; maximum allowable concentrations are to be less than acute or chronic problem levels as revealed by bioassay or other methods. Concentrations of toxic or other deleterious substances, pesticides and organic and inorganic materials including heavy metals, are not to exceed levels known or demonstrated to be of public health significance; also maximum allowable concentrations are to be less than acute or chronic problem levels as revealed by bioassay or other methods. Toxic substances narrative: Concentrations of toxic or deleterious substances, pesticides and organic and inorganic materials including heavy metals, are to be less than those demonstrated to be deleterious to livestock or plants or their subsequent consumption by humans or to adversely affect other indicated uses.	Water supply (classes A-Open-D₁, B-D₁, B-D₂, B-D₃) Fish, aquatic life, wildlife, agriculture, industrial, recreation in and on the water (classes C-D₁, C-D₂) Agricultural and industrial (other than food processing)
Nebraska ²⁴	Not specified Toxic substances narrative: none alone or in combination with other substances or wastes in concentrations rendering the receiving water unsafe or unsuitable for the assigned beneficial uses.	All All
Nevada ²⁵	0.05 0.05	All (Truckee River as indicated in Table 43A of Nevada Water Pollution Control Regs., Article 4.2.5) All (all waters indicated in Article 4.1.3.1, Nevada Water Pollution Control Regs.)

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Nevada (con't)	0.1	All (all waters indicated in Article 4.1.3.2, Nevada Water Pollution Control Regs.)
	Toxic substances narrative: free from toxic substances attributable to domestic or industrial waste or other controllable sources at levels or combinations sufficient to be toxic to human, animal, plant or aquatic life. The presence of toxic materials in a water shall be evaluated by use of a 96-hour bioassay. Survival of test organisms shall not be less than that in control tests which utilize appropriate control water. Failure to determine presence of toxic materials by these methods shall not preclude determination of excessive levels of toxic materials on the basis of other criteria or methods. No wastes from municipal or industrial or other controllable sources containing arsenic, barium, boron, cadmium, chromium, cyanide, fluoride, lead selenium, silver, copper and zinc that are reasonably amenable to treatment or control will be discharged untreated or uncontrolled into the waters of Nevada. In addition, the limits for concentrations of the chemical constituents will provide water quality consistent with the mandatory requirements of the 1962 Public Health Service Drinking Water Standards.	All
	None (zero)	Drinking water supply (with treatment by disinfection only) suitable for aquatic life habitat, wild-life propagation, agricultural, recreation, boating, esthetics
	Toxic substances narrative: only such amounts as will not render receiving waters injurious to fish or wildlife.	Drinking water supply (with treatment by disinfection and filtration only), agricultural, aquatic life and wildlife propagation, recreation, industrial and esthetics

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Nevada (con't)	Toxic substances narrative: only such amounts as will not render receiving waters injurious to fish and wildlife.	Drinking water supply (following complete treatment), agricultural, aquatic life, wildlife propagation, recreation, and industrial
	Toxic substances narrative: only such amounts as will not impair receiving waters for uses of this class.	Boating and esthetics, aquatic life, agricultural and industrial (except for food processing purposes)
New Hampshire ²⁶	Not specified	All
	Toxic substances narrative: shall be free from chemicals inimical to fish life or the maintenance of fish life	Fish life or the maintenance of fish life
	Toxic substances narrative: no potentially toxic substances unless naturally occurring.	Water supply
	Toxic substances narrative: no potentially toxic substances in toxic concentrations or combinations.	All except water supply
	Bioassay procedures and application factors used in establishing limits on toxic substances shall, as a minimum, be no less rigorous than the recommendations for bioassays and application factors contained in the National Technical Advisory Committee's report to the Secretary of the Interior on WATER QUALITY CRITERIA, April 1, 1968 or latest revision thereof.	
New Jersey ²⁷	0.05 (Hexavalent)	All
	Toxic substances narrative: shall not exceed 1/20th of the TL50 value at 96 hours. Combinations of toxic substances will be based on the same principle.	All
	Toxic substances narrative: a concentration of a persistent pesticide shall not exceed 1/100 of the TL50 at 96 hours as determined by appropriate bioassay.	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
New Jersey (con't)	Toxic substances narrative: no man-made wastewater discharges. Toxic substances narrative: none, either alone or in combination with other substances, in concentrations as to affect humans or be detrimental to the natural aquatic biota or to other designated uses. None which would cause drinking water standards to be exceeded after appropriate treatment. Toxic substances narrative: none either alone or in combination with other substances; in concentrations as to affect humans or be detrimental to the natural aquatic biota or to other designated uses.	Maintenance of natural state quality (Class FW-1 waters designated to be set aside for posterity to represent the natural aquatic environment and its associated biota) Public water supply (after treatment); propagation of natural biota; primary contact recreation; industrial and agricultural water supply; shellfish harvesting; secondary contact recreation; migration of anadromous fish; maintenance of wildlife; other reasonable uses Propagation of natural biota; primary and secondary contact recreation; industrial and agricultural water supply; shellfish harvesting; migration of anadromous fish; maintenance of wildlife; other reasonable uses
New Mexico ²⁸	Not specified Toxic substances narrative: shall not be present in concentrations which will change the ecology of receiving waters to an extent detrimental to man or other organisms of direct or indirect commercial, recreational or esthetic value. Toxicities of substances in receiving waters will be determined by appropriate bioassay techniques, or other acceptable means, for the particular form of aquatic life which is to be preserved with the concentrations of toxic materials not to exceed 5 percent of the 96-hour LD50 provided that: toxic substances which, through uptake in the aquatic food chain and/or storage in plant and animal tissues, can be magnified to levels which are toxic to man or other organisms, shall not be present in concentrations which result in this biological magnification.	All Recreation; desirable aquatic life

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Ohio ³²	0.1	Warmwater habitat Note A
	0.05	Exceptional warmwater habitat; coldwater habitat; Note A.
	0.1	Seasonal warmwater habitat, Note A
	0.1 (case by case variations)	Limited warmwater habitat; Note A
	0.05	Public water supply Note A
	0.1	Agricultural water supply Note A
	0.05	All Lake Erie uses Note B
	0.05 (Hexavalent)	All Ohio River uses
	0.1	All Lower Cuyahoga River uses.
	General narrative: free from substances resulting from human activities in con- centrations toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone.	All
	Antidegradation policy: present ambient water quality will be maintained for all toxic substances.	All
	Toxic substances narrative: 0.01 times 96- hour TLM or LC50 for representative aquatic species. Persistent toxicants shall not exceed 0.01 times 96-hour TLM or LC50. TLM or LC50 shall be deter- mined by static or dynamic bioassays. At least 90 per cent of the volume of the mixing zone shall not exceed at any time the 24- to 96-hour TLM or LC50 for representative aquatic species.	Warmwater habitat; excep- tional warmwater habitat; coldwater habitat; seasonal warmwater habitat; limit- ed warmwater habitat. All Lake Erie uses

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Ohio ³²	0.1	Warmwater habitat Note A
	0.05	Exceptional warmwater habitat; coldwater habitat; Note A.
	0.1	Seasonal warmwater habitat, Note A
	0.1 (case by case variations)	Limited warmwater habitat; Note A
	0.05	Public water supply Note A
	0.1	Agricultural water supply Note A
	0.05	All Lake Erie uses Note B
	0.05 (Hexavalent)	All Ohio River uses
	0.1	All Lower Cuyahoga River uses.
	General narrative: free from substances resulting from human activities in con- centrations toxic or harmful to human, animal or aquatic life and/or are rapidly lethal in the mixing zone.	All
	Antidegradation policy: present ambient water quality will be maintained for all toxic substances.	All
	Toxic substances narrative: 0.01 times 96- hour TLM or LC50 for representative aquatic species. Persistent toxicants shall not exceed 0.01 times 96-hour TLM or LC50. TLM or LC50 shall be deter- mined by static or dynamic bioassays. At least 90 per cent of the volume of the mixing zone shall not exceed at any time the 24- to 96-hour TLM or LC50 for representative aquatic species.	Warmwater habitat; excep- tional warmwater habitat; coldwater habitat; seasonal warmwater habitat; limit- ed warmwater habitat. All Lake Erie uses

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Ohio (con't)	Note A: see exceptions under Ohio Administrative Code Regulations 3745-1-08-(C)(1) for certain stream segments. Note B: see exceptions under Ohio Administrative Code Regulations 3745-1-11(C) for certain areas.	
Oklahoma ³³	0.05 (Hexavalent) Toxic substances narrative: waters will not be toxic to humans, fish and wildlife, and other terrestrial and aquatic life, nor detrimental to any beneficial use including continued ingestion by livestock or use for irrigation. Toxic substances shall not be present in quantities which allow significant bioaccumulation and/or biomagnification in the food chain. Toxic substances narrative: toxic substances not removable by ordinary water treatment techniques shall not exceed the limits in Section 4.1 of the Oklahoma Water Quality Standards. Toxic substances narrative: concentrations of nonpersistent toxic substances shall not exceed 0.1 of the 96-hour LC50 for the most sensitive indigenous species. Concentrations of persistent toxicants shall not exceed 0.05 of the 96-hour LC50, for the most sensitive indigenous species. Bioassay data for <u>Pimephales prommelas</u> (Fathead minnow) and/or <u>Lepomis macrochirus</u> (Bluegill) shall be used in determining compliance. Mixing zones narrative: shall not exceed the 96-hour TLM for the most sensitive indigenous species.	Public and private water supplies All Public and private water supplies Aquatic life All
Oregon ³⁴	General water quality standards applicable to all waters except where superseded by special water quality standards applicable to specifically designated waters. No wastes shall be discharged	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Oregon (con't)	and no activities shall be conducted which either alone or in combination with other wastes or activities will cause toxic conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water.	
	0.05 Special water quality standard applicable to: Main stem Klamath River; Multnomah Channel; Main stem Willamette River; Main stem Columbia River from eastern Oregon-Washington border westward to Pacific Ocean; Main stem Grande Ronde River; Main stem Walla Walla River; Main stem Snake River in and adjacent to Oregon.	All
	0.02 Special water quality standard applicable to Rouge River Basin; Umpqua River Basin; McKenzie River Basin; Santiam River Basin.	All
Pennsylvania ³⁵	0.05 (Hexavalent)	All
	Toxic substances narrative: shall not be inimical or injurious to the designated water use.	All
Rhode Island ³⁶	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, impair the palatability of same, or impair the waters for any other uses.	Class SA/SA _m
	None in concentrations on combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish of shellfish or their propagation, or impair the water for any other usage assigned to this Class.	Class SB
	None in concentrations or combinations which would be harmful to human, animal or aquatic life or which would make the waters unsafe or unsuitable for fish or shellfish or their propagation, or impair	Class SC

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Rhode Island (con't)	the water for any other usage assigned to this Class. Waters shall be free from chemical constituents in concentrations or combinations which would be harmful to human, animal, or aquatic life for the appropriate most sensitive and governing water class use or unfavorably alter the biota. In areas where fisheries are the governing considerations and approved limits have not been established, bioassays shall be performed as required by the appropriate agencies. The latest edition of the federal publication Water Quality Criteria will be considered the interpretation and application of bioassay result. Bioassays shall be performed according to the latest edition of Standard Methods for the Examination of Water and Wastewater (APHA). For public drinking water supplies, the limit prescribed by the United States Environmental Protection Agency will be used where not superseded by more stringent state requirements.	
South Carolina ³⁷	Not specified Toxic substances narrative: none (zero). Toxic substances narrative: none in amounts exceeding limitations established and adopted by the Department of Health and Environmental Control. Toxic substances narrative: none alone or in combination with other substances or wastes in sufficient amounts to be injurious to edible fish or shellfish or the culture or propagation thereof.	All Domestic and food processing; trout fishing; outstanding recreational or ecological resources Direct water contact (swimming); domestic supply; propagation of fish; industrial; agricultural Shellfish harvesting; direct water contact (swimming); crabbing; commercial fishing; propagation of marine fauna and flora

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
South Carolina (con't)	Toxic substances narrative: shall be free from toxic substances attributable to sewage, industrial waste, or other waste in concentrations or combinations which are harmful to human, animal, plant or aquatic life.	All
South Dakota ³⁸	0.05 Concentrations of chemicals toxic to humans, animals, plants, or the most sensitive stage or form of aquatic life, greater than 0.1 times the median tolerance limit for short residual compounds or 0.01 times the median tolerance limit for an accumulative substance or substances exhibiting a residual life exceeding thirty days in the receiving waters. Median tolerance limits shall be determined in accordance with section 34:04:02:06. Concentrations specified for toxic materials shall be based on daily averages, but the concentrations shall not exceed one hundred and twenty-five per cent of the value specified in this section at any time or at any point in the receiving water.	Domestic Water Supply All
Tennessee ³⁹	The instream concentrations of toxic pollutants shall not exceed 1/10 of the 96-hour LC50 based upon available data using one or more of the most sensitive organisms significant to aquatic community of the waters under consideration. Cumulative substance may be further limited on a case-by-case basis. Toxic substances narrative: No toxic substances added that will produce toxic conditions that materially affect man or animals; impair the safety of a conventionally treated water supply; affect the water for industrial processing, fish or aquatic life, man or animal, livestock and wildlife, navigation, irrigation.	Aquatic life All
Texas ⁴⁰	Not specified	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Texas (con't)	Toxic substances narrative: the surface waters of the State shall be maintained so that they will not be toxic to man, fish and wildlife, and any other terrestrial and aquatic life. Toxic substances narrative: toxic materials not removable by ordinary water treatment techniques shall not exceed USPHS Drinking Water Standards or those established by EPA pursuant to the Safe Drinking Water Act. For a general guide, with respect to fish toxicity, receiving waters outside mixing zones should not have a concentration of nonpersistent toxic materials exceeding 0.1 of the 96-hour TLm, where the bioassay is made using fish indigenous to the receiving waters. For persistent toxicants, concentrations should not exceed 0.05 of the 96-hour TLm.	All Public drinking water supplies
Utah ⁴¹	0.05 dissolved (disapproved by EPA, promulgation pending) 0.1 dissolved (disapproved by EPA, promulgation pending) 0.1 dissolved (disapproved by EPA, promulgation pending. Toxic substances narrative: it shall be unlawful to discharge or place any waste or other substance in concentrations or combinations which produce undesirable physiological responses in desirable resident fish, or other desirable aquatic life, as determined by bioassay or other tests.	Domestic water supplies Aquatic life Agriculture All
Vermont ⁴²	Not Specified Wastes discharged to waters of the State shall contain no chemical or radiological constituents which would be inconsistent with the water uses associated with the assigned water class.	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Vermont (con't)	Discharge of radioactive material to waters of the State shall not exceed the lowest practicable limits after utilization of the latest technological development and equipment for control of radioactive emissions. In no event shall the discharge of such materials exceed the limits established by the Agency of Human Services. There shall be no discharge of wastes containing any of the prohibited substances set forth below in detectable amounts either to waters of the State or to a municipal wastewater collection and/or treatment facility except in those cases where a process water contains an incoming level of a prohibited substance due to natural or other causes. In such cases the concentration of the prohibited substance or substances in the actual wastes discharged shall not be increased.	
Virginia ⁴³	250 (total) 0.1 (total) Toxic substances narrative: free from toxic substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations which are inimical or harmful to human, animal, plant, or aquatic life.	Public water supply (at raw water intake point). All All
Washington ⁴⁴	Not Specified Toxic substances narrative: toxic material concentrations shall be below those which adversely affect public health, and the natural aquatic environment. Toxic substances narrative: toxic material concentrations shall be below those which adversely affect public health, or which may cause acute or chronic toxic conditions to the aquatic biota.	All All uses for extraordinary (class AA) and lake class waters All uses for excellent (class A), good (class B), and fair (class C) waters

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Washington (con't)	Deleterious concentrations of toxic, or other nonradioactive materials, shall be determined by the department in consideration of the "Quality Criteria for Water," published by EPA 1976, and as revised, as the authoritative source for criteria and/or other relevant information, if justified.	
West Virginia ⁴⁵	0.05 (Hexavalent)	All
	Toxic substances narrative: not to exceed 0.1 of the 96-hour TLm.	All
	No sewage, industrial wastes or other wastes present in any of the waters of the State shall have concentrations of materials poisonous to human, animal, or aquatic life.	All
Wisconsin ⁴⁶	Not specified	All
	Toxic substances narrative: substances in concentrations or combinations which are toxic or harmful to humans shall not be present in amounts found to be of public health significance, nor which are acutely harmful to animal, plant or aquatic life.	All
	Toxic substances narrative: the intake water supply will by appropriate treatment and adequate safeguards meet the PHS Drinking Water Standards, 1962.	Public water supply
Wyoming ⁴⁷	Not specified	All
	Toxic substances narrative: none in concentrations or combinations attributable to or influenced by the activities of man which would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life. Maximum allowable concentrations shall be based on latest edition of <u>Quality Criteria for Water</u> by EPA and/or more generally accepted scientific information.	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
American Samoa ^E	Not Specified	All
	Free from substances or combinations thereof attributable to sewage, industrial wastes, or other wastes which may be toxic to humans, other animals, plants, and aquatic life.	All
	Substances of unknown toxicity; All effluents containing foreign materials shall be considered harmful and not permissible until acceptable bioassay tests have shown otherwise. It is the obligation of the person producing the effluent to demonstrate that it is harmless, at the request of the Environmental Quality Commission.	
	Compliance with Section VLE. of these Standards will be determined by use of indicator organisms, analysis of species diversity, population density, growth anomalies, bioassays of appropriate duration or other appropriate methods as specified by the Environmental Quality Commission.	
	The survival of aquatic life in surface waters shall not be less than that for the same water body in areas unaffected by sewage, industrial wastes or other activities of man, or, when necessary, for other control water that is consistent with the requirements for "experimental water" as described in <u>Standard Methods for the Examination of Water and Wastewater</u> (latest edition). As a minimum, compliance with the objectives as stated in the previous sentence shall be evaluated with a 96-hour bioassay.	
	In addition, effluent limits based upon acute bioassays of effluents will be prescribed where appropriate; additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available; and source control of toxic substances will be encouraged.	

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
District of Columbia ⁴⁸	0.1	Aquatic life
	0.05	Domestic Water Supply
	Toxic substances narrative: The waters shall at all times be free from: toxic substances attributable to sewage, industrial waste, or other waste in concentrations or combinations which interfere directly or indirectly with water uses, or which are harmful to human, animal, plant, or aquatic life.	All
Guam ^F	0.01; or 0.01 x 96-hour LC50, whichever is less	All
	0.05	Drinking water supply
	In order to provide maximum protection for the propagation of fish and wildlife, concentrations of toxic substances shall not exceed levels calculated by multiplying the application factors by the 96-hour LC50 values determined using the receiving water in question and the most sensitive species of aquatic organism affected.	All surface waters of the Territory except 2c
	When the concentration based on the 96-hour LC50 data exceeds the maximum numerical limits, the numerical limits shall constitute the criteria.	
	The application factors and maximum numerical limits are derived from the NAS-NAE 1972 Report of the Committee on <u>Water Quality Criteria</u> .	
Puerto Rico ⁴⁹	0.3 (Trivalent)	All (coastal waters)
	0.05 (Trivalent)	All (surface waters)
	0.05 (Hexavalent)	All (surface and coastal waters)
	Toxic substances narrative: shall not contain substances in concentrations or combinations which are toxic or which produce undesirable physiological responses in human, fish or other animal life, and	All

<u>State</u>	<u>Criteria Value in mg/l</u>	<u>Designated Stream Use</u>
Puerto Rico (con't)	plants. When two or more toxic materials are present at the same time, the chronic effect of such combinations shall be taken into account and the applicable standard shall be determined by bioassay or other approved method.	
Trust Territory of the Pacific Islands ^G	Free from substances or combinations thereof attributable to sewage, industrial wastes, or other wastes toxic to humans, animals, plants and aquatic life.	All
Virgin Islands ^H	All surface waters shall be free of substances attributable to municipal, industrial, or other discharges or wastes in concentrations or combinations which are toxic or which produce undesirable physiological responses in human, fish and other animal life, and plants.	All

