340-041-0033

Toxic Substances

(1) Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses.

(2) Levels of toxic substances in waters of the state may not exceed the applicable criteria listed in Tables 20, 33A, and 33B. Tables 33A and 33B, adopted on May 20, 2004, update Table 20 as described in this section.

(a) Each value for criteria in Table 20 is effective until the corresponding value in Tables 33A or 33B becomes effective.

(A) Each value in Table 33A is effective on February 15, 2005, unless EPA has disapproved the value before that date. If a value is subsequently disapproved, any corresponding value in Table 20 becomes effective immediately. Values that are the same in Tables 20 and 33A remain in effect.

(B) Each value in Table 33B is effective upon EPA approval.

(b) The department will note the effective date for each value in Tables 20, 33A, and 33B as described in this section.

(3) To establish permit or other regulatory limits for toxic substances for which criteria are not included in Tables 20, 33A, or 33B, the department may use the guidance values in Table 33C, public health advisories, and other published scientific literature. The department may also require or conduct bio-assessment studies to monitor the toxicity to aquatic life of complex effluents, other suspected discharges, or chemical substances without numeric criteria.

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 3-2004, f. & cert. ef. 5-28-04

340-041-0061

Other Implementation of Water Quality Criteria

(1) A waste treatment and disposal facility may not be constructed or operated and wastes may not be discharged to public waters without a permit from the department in accordance with ORS 468B.050.

(2) Water quality variances. The commission may grant point source variances from the water quality standards in this Division where the following requirements are met.

(a) The water quality variance may apply only to the point source for which the variance is requested and only to the pollutant or pollutants specified in the variance; the underlying water quality standard otherwise remains in effect.

(b) A water quality standard variance may not be granted if:

(A) Standards will be attained by all point source dischargers implementing effluent limitations required under sections 301(b) and 306 of the federal Clean Water Act and by nonpoint sources implementing cost-effective and reasonable best management practices; or

(B) The variance would likely jeopardize the continued existence of any threatened or endangered species listed under section 4 of the Endangered Species Act or result in the destruction or adverse modification of such species' critical habitat.

(c) Before a variance is granted, the applicant must demonstrate that attaining the water quality standard is not feasible for one of the following reasons:

(A) Naturally occurring pollutant concentrations prevent the attainment of the use.

(B) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable uses to be met without violating state water conservation requirements.

(C) Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.

(D) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way which would result in the attainment of the use.

(E) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and unrelated to water quality preclude attainment of aquatic life protection uses.

(F) Controls more stringent than those required by sections 301(b) and 306 of the federal Clean Water Act would result in substantial and widespread economic and social impact.

(d) Procedures. An applicant for a water quality standards variance must submit a request for a variance to the department. The application must include all relevant information showing that the requirements for a variance have been satisfied. The burden is on the applicant to demonstrate that the designated use is unattainable for one of the reasons specified in subsection (c) of this section. If the department preliminarily determines that grounds exist for granting a

variance, it must provide public notice of the proposed variance and an opportunity for public comment.

(A) The department may condition the variance on the performance of additional studies, monitoring, management practices, and other controls deemed necessary. These terms and conditions will be incorporated into the applicant's NPDES permit or department order.

(B) A variance may not exceed three years or the term of the NPDES permit, whichever is less. A variance may be renewed if the applicant reapplies and demonstrates that the use in question is still not attainable. Renewal of the variance may be denied if the applicant does not comply with the conditions of the original variance or otherwise does not meet the requirements of this section.

(C) DEQ approval of a variance for a point source is not effective under the federal Clean Water Act until submitted to and approved by EPA.

(3) Plans for all sewage and industrial waste treatment, control, and disposal facilities must be submitted to the department for review and approval prior to construction as required by ORS 468B.055.

(4) Minimum design criteria for waste treatment and control facilities prescribed under this plan and other waste treatment and controls deemed necessary to ensure compliance with the water quality standards contained in this plan must be provided in accordance with specific permit conditions for those sources or activities for which permits are required and the following implementation program.

(a) For new or expanded waste loads or activities, fully approved treatment or control facilities, or both, must be provided prior to discharge of any wastes from the new or expanded facilities or conduct of the new or expanded activity.

(b) For existing waste loads or activities, additional treatment or control facilities necessary to correct specific unacceptable water quality conditions must be provided in accordance with a specific program and timetable incorporated into the waste discharge permit for the individual discharger or activity. In developing treatment requirements and implementation schedules for existing installations or activities, consideration will be given to the impact upon the overall environmental quality, including air, water, land use, and aesthetics.

(c) Wherever minimum design criteria for waste treatment and control facilities set forth in this plan are more stringent than applicable federal standards and treatment levels currently being provided, upgrading to the more stringent requirements will be deferred until it is necessary to expand or otherwise modify or replace the existing treatment facilities. Such deferral will be acknowledged in the permit for the source.

(d) Where planning, design, or construction of new or modified waste treatment and controls to meet prior applicable state or federal requirements is underway at the time this plan is adopted, such plans, design, or construction may be completed under the requirements in effect when the

project was initiated. Upgrading to meet more stringent future requirements will be timed in accordance with section (3) of this rule.

(5) Confined animal feeding operations (CAFOs) are regulated under OAR 340-051-0005 through 340-051-0080 to minimize potential adverse effect on water quality (see also OAR 603-074-0005 through 603-074-0070).

(6) Programs for control of pollution from nonpoint sources when developed by the department or by other agencies pursuant to section 208 of the federal Clean Water Act and approved by the department will be incorporated into this plan by amendment via the same process used to adopt the plan unless other procedures are established by law.

(7) Where minimum requirements of federal law or enforceable regulations are more stringent than specific provisions of this plan, the federal requirements will prevail.

(8) Within the framework of statewide priorities and available resources, the department will monitor water quality within the basin for the purposes of evaluating conformance with the plan and developing information for additions or updates.

(9) The commission recognizes that the potential exists for conflicts between water quality management plans and the land use plans and resource management plans that local governments and other agencies are required to develop. If conflicts develop, the department will meet with the local governments or responsible agencies to resolve the conflicts. Revisions will be presented for adoption via the same process used to adopt the plan unless other specific procedures are established by law.

(10) The department will calculate and include effluent limits specified in pounds per day, which will be the mass load limits for biochemical oxygen demand or carbonaceous biochemical oxygen demand and total suspended solids in National Pollutant Discharge Elimination System permits issued to all sewage treatment facilities. These limits must be calculated as follows.

(a) Except as noted in paragraph (H) of this subsection, the following requirements apply to existing facilities and to facilities receiving departmental approval for engineering plans and specifications for new treatment facilities or treatment facilities expanding the average dry weather treatment capacity before June 30, 1992:

(A) During periods of low stream flows (approximately May 1 through October 31), the monthly average mass load expressed as pounds per day may not exceed the applicable monthly concentration effluent limit times the design average dry weather flow expressed in million gallons per day times 8.34. The weekly average mass load expressed as pounds per day may not exceed the monthly average mass load times 1.5. The daily mass load expressed in pounds per day may not exceed the monthly average mass load times 2.0.

(B) During the period of high stream flows (approximately November 1 through April 30), the monthly average mass load expressed as pounds per day may not exceed the monthly concentration effluent limit times the design average wet weather flow expressed in million

gallons per day times 8.34. The weekly average mass load expressed as pounds per day may not exceed the monthly average mass load times 1.5. The daily mass load expressed in pounds per day may not exceed the monthly average mass load times 2.0.

(C) On any day that the daily flow to a sewage treatment facility exceeds the lesser hydraulic capacity of the secondary treatment portion of the facility or twice the design average dry weather flow, the daily mass load limit does not apply. The permittee must operate the treatment facility at highest and best practicable treatment and control.

(D) The design average wet weather flow used in calculating mass loads must be approved by the department in accordance with prudent engineering practice and must be based on a facility plan approved by the department, engineering plans and specifications approved by the department, or an engineering evaluation. The permittee must submit documentation describing and supporting the design average wet weather flow with the permit application, application for permit renewal, or modification request or upon request by the department. The design average wet weather flow is defined as the average flow between November 1 and April 30 when the sewage treatment facility is projected to be at design capacity for that portion of the year.

(E) Mass loads assigned as described in paragraphs (B) and (C) of this subsection will not be subject to OAR 340-041-0004(7);

(F) Mass loads as described in this rule will be included in permits upon renewal or upon a request for permit modification.

(G) Within 180 days after permit renewal or modification, a permittee receiving higher mass loads under this rule and having a separate sanitary sewer system must submit to the department for review and approval a proposed program and time schedule for identifying and reducing inflow. The program must include the following:

(i) Identification of all overflow points and verification that sewer system overflows are not occurring up to a 24-hour, five-year storm event or equivalent;

(ii) Monitoring of all pump station overflow points;

(iii) A program for identifying and removing all inflow sources into the permit holder's sewer system over which the permit holder has legal control; and

(iv) For those permit holders not having the necessary legal authority for all portions of the sewer system discharging into the permit holder's sewer system or treatment facility, a program and schedule for gaining legal authority to require inflow reduction and a program and schedule for removing inflow sources.

(H) Within one year after the department's approval of the program, the permit holder must begin implementation of the program.

(I) Paragraphs (A) through (G) of this subsection do not apply to the cities of Athena, Elgin, Adair Village, Halsey, Harrisburg, Independence, Carlton, and Sweet Home. Mass load limits have been individually assigned to these facilities.

(b) For new sewage treatment facilities or treatment facilities expanding the average dry weather treatment capacity and receiving engineering plans and specifications approval from the department after June 30, 1992, the mass load limits must be calculated by the department based on the proposed treatment facility capabilities and the highest and best practicable treatment to minimize the discharge of pollutants.

(c) Mass load limits as defined in this rule may be replaced by more stringent limits if required by waste load allocations established in accordance with a TMDL for treatment facilities discharging to water quality limited streams or if required to prevent or eliminate violations of water quality standards.

(d) If the design average wet weather flow or the hydraulic secondary treatment capacity is not known or has not been approved by the department at the time of permit issuance, the permit must include as interim mass load limits the mass load limits in the previous permit issued to the permit holder for the treatment facility. The permit must also include a requirement that the permit holder submit to the department the design average wet weather flow and hydraulic secondary treatment capacity within 12 months after permit issuance. Upon review and approval of the design flow information, the department will modify the permit and include mass load limits as described in subsection (a) of this section.

(e) Each permit holder with existing sewage treatment facilities otherwise subject to subsection (a) of this section may choose mass load limits calculated as follows:

(A) The monthly average mass load expressed as pounds per day may not exceed the applicable monthly concentration effluent limit times the design average dry weather flow expressed in million gallons per day times 8.34 pounds per gallon.

(B) The weekly average mass load expressed as pounds per day may not exceed the monthly average mass load times 1.5.

(C) The daily mass load expressed in pounds per day may not exceed the monthly average mass load times 2.0. If existing mass load limits are retained by the permit holder, the terms and requirements of subsection (a) of this section do not apply.

(f) The commission may grant exceptions to subsection (a) of this section. In allowing increased discharged loads, the commission must make the findings specified in OAR 340-041-0004(9)(a) for waste loads and the following findings:

(A) Mass loads calculated in subsection (a) of this section cannot be achieved with the existing treatment facilities operated at maximum efficiency at projected design flows; and

(B) There are no practicable alternatives to achieving the mass loads as calculated in subsection (a) of this section.

(11) Forestry on state and private lands. For forest operations on state or private lands, water quality standards are intended to be attained and are implemented through best management practices and other control mechanisms established under the Forest Practices Act (ORS 527.610 to 527.992) and rules thereunder, administered by the Oregon Department of Forestry. Therefore, forest operations that are in compliance with the Forest Practices Act requirements are (except for the limits set out in ORS 527.770) deemed in compliance with this division. DEQ will work with the Oregon Department of Forestry to revise the Forest Practices program to attain water quality standards.

(12) Agricultural water quality management plans to reduce agricultural nonpoint source pollution are developed and implemented by the Oregon Department of Agriculture (ODA) through a cooperative agreement with the department to implement applicable provisions of ORS 568.900 to 568.933 and 561.191. If the department has reason to believe that agricultural discharges or activities are contributing to water quality problems resulting in water quality standards violations, the department may consult with the ODA. If water quality impacts are likely from agricultural sources and the department determines that a water quality management plan is necessary, the director may write a letter to the director of the ODA requesting that such a management plan be prepared and implemented to reduce pollutant loads and achieve the water quality criteria.

(13) Agriculture and forestry on federal lands. Agriculture and forestry activities conducted on federal land must meet the requirements of this division and are subject to the department's jurisdiction. Pursuant to Memoranda of Agreement with the U.S. Forest Service and the Bureau of Land Management, water quality standards are expected to be met through the development and implementation of water quality restoration plans, best management practices, and aquatic conservation strategies. Where the department designates a federal agency as a designated management agency, implementation of these plans, practices, and strategies is deemed compliance with this division.

(14) Testing methods. The analytical testing methods for determining compliance with the water quality standards in this rule must comply with 40 CFR Part 136 or, if Part 136 does not prescribe a method, with the most recent edition of Standard Methods for the Examination of Water and Waste Water published jointly by the American Public Health Association, American Water Works Association, and Water Pollution Control Federation; if the department has published an applicable superseding method, testing must comply with the superseding method. Testing in accordance with an alternative method must comply with this rule if the department has published the method or has approved the method in writing.

(15) Reservoirs or managed lakes are deemed in compliance with water quality criteria for temperature, pH, or dissolved oxygen (DO) if all of the following circumstances exist.

(a) The water body has thermally stratified naturally or due to the presence of an impoundment.

(b) The water body has three observable layers, defined as the epilimnion, metalimnion, and hypolimnion.

(c) A layer exists in the reservoir or managed lake in which temperature, pH, and DO criteria are all met, and the layer is sufficient to support beneficial uses.

(d) All practicable measures have been taken by the entities responsible for management of the reservoir or managed lake to maximize the layers meeting the temperature, pH, and DO criteria.

(e) One of the following conditions is met:

(A) The streams or river segments immediately downstream of the water body meet applicable criteria for temperature, pH, and DO.

(B) All practicable measures have been taken to maximize downstream water quality potential and fish passage.

(C) If the applicable criteria are not met in the stream or river segment immediately upstream of the water body, then no further measurable downstream degradation of water quality has taken place due to stratification of the reservoir or managed lake.

(16) Compliance schedules. In a permit issued under OAR 340, division 045 or in a water quality certification under OAR 340, division 48, the department may include compliance schedules for the implementation of effluent limits derived from water quality criteria in this division. A compliance schedule in an NPDES permit is allowed only for water quality based effluent limits that are newly applicable to the permit and must comply with provisions in 40 CFR ¦122.47 (including the requirement that water quality criteria must be achieved as soon as possible).

Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 3-2004, f. & cert. ef. 5-28-04

WATER QUALITY CRITERIA SUMMARY[1]

The concentration for each compound listed in Table 20 is a criterion not to be exceeded in waters of the state in order to protect aquatic life and human health. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding designations as to whether EPA has identified it as a priority pollutant and a carcinogen, aquatic life freshwater acute and chronic criteria, aquatic life marine acute and chronic criteria, human health water & organism and fish consumption only criteria, and Drinking Water Maximum Contaminant Level (MCL). The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
ACENAPTHENE	Y	N							
ACROLEIN	Y	N					320ug	780ug	
ACRYLONITRILE	Y	Y					0.058ug**	0.65ug**	
ALDRIN	Y	Y	3		1.3		0.074ng**	0.079ng**	
ALKALINITY	N	N		20,000					
AMMONIA	N	N	CRITERIA ARE pH AND TEMPERATURE DEPENDENT—SEE DOCUMENT USEPA JANUARY 1985 (Fresh Water) CRITERIA ARE pH AND TEMPERATURE DEPENDENT—SEE DOCUMENT USEPA APRIL 1989 (Marine Water)						
ANTIMONY	Y	N					146ug	45,000ug	
ARSENIC	Y	Y					2.2ng**	17.5ng**	0.05mg
ARSENIC (PENT)	Y	Y							
ARSENIC (TRI)	Y	Y	360	190	69	36			
ASBESTOS	Y	Y					30K f/L**		
BARIUM	N	N					1mg		1.0mg
BENZENE	Y	Y					0.66ug**	40 ug**	
BENZIDINE	Y	Y					0.12ng	0.53ng**	
BERYLLIUM	Y	Y					6.8ng**	117ng**	
BHC	Y	N							
CADMIUM	Y	N	3.9+	1.1+	43	9.3	10ug		0.010mg
CARBON TETRACHLORIDE	Y	Y					0.4ug**	6.94ug**	
CHLORDANE	Y	Y	2.4	0.0043	0.09	0.004	0.46ng**	0.48ng**	
CHLORIDE	N	N	860 mg/L	230 mg/L					
CHLORINATED BENZENES	Y	Y					488 ug		
CHLORINATED NAPHTHALENES	Y	N							
CHLORINE	N	N	19	11	13	7.5			
CHLOROALKYL ETHERS	Y	N							
CHLOROETHYL ETHER (BIS-2)	Y	Y					0.03 ug	1.36 ug**	

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
CHLOROFORM	Y	Y					0.19ug**	15.7ug**	
CHLOROISOPROPYL ETHER (BIS-2)	Y	N					34.7ug	4.36mg	
CHLOROMETHYL ETHER (BIS)	N	Y					0.00000376ng**	0.00184ug**	
CHLOROPHENOL 2	Y	N							
CHLOROPHENOL 4	N	N							
CHLOROPHENOXY HERBICIDES (2,4,5,-TP)	N	N					10ug		
CHLOROPHENOXY HERBICIDES (2,4-D)	N	N					100ug		
CHLORPYRIFOS	N	N	0.083	0.041	0.011	0.0056			
CHLORO-4 METHYL-3 PHENOL	N	N							
CHROMIUM (HEX)	Y	N	16	11	1,100	50	50ug		0.05mg
CHROMIUM (TRI)	N	N	1,700.+	210.+			170mg	3,433mg	0.05mg
COPPER	Y	N	18.+	12.+	2.9	2.9			
CYANIDE	Y	N	22	5.2	1	1	200ug		
DDT	Y	Y	1.1	0.001	0.13	0.001	0.024ng**	0.024ng**	
(TDE) DDT METABOLITE	Y	Y							
(DDE) DDT METABOLITE	Y	Y							
DEMETON	Y	N		0.1		0.1			
DIBUTYLPHTHALATE	Y	N					35mg	154mg	
DICHLOROBENZENES	Y	N					400ug	2.6mg	
DICHLOROBENZIDINE	Y	Y					0.01ug**	0.020ug**	
DICHLOROETHANE 1,2	Y	Y					0.94ug**	243ug**	
DICHLOROETHYLENES	Y	Y					0.033ug**	1.85ug**	
DICHLOROPHENOL 2,4	N	N					3.09mg		
DICHLOROPROPANE	Y	N							
DICHLOROPROPENE	Y	N					87ug	14.1mg	
DIELDRIN	Y	Y	2.5	0.0019	0.71	0.0019	0.071ng**	0.076ng**	
DIETHYLPHTHALATE	Y	N					350mg	1.8g	
DIMETHYL PHENOL 2,4	Y	N							
DIMETHYL PHTHALATE	Y	N					313mg	2.9g	
DINITROTOLUENE 2,4	N	Y					0.11ug**	9.1ug**	
DINITROTOLUENE	Y	N					70ug	14.3mg	

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
DINITROTOLUENE	N	Y							
DINITRO-O-CRESOL 2,4	Y	N					13.4	765ug	
DIOXIN (2,3,7,8-TCDD)	Y	Y					0.000013ng**	0.000014ng**	
DIPHENYLHYDRAZINE	Y	N					42ng**	0.56ug**	
DIPHENYLHYDRAZINE 1,2	Y	N							
DI-2-ETHYLHEXYL PHTHALATE	Y	N					15mg	50mg	
ENDOSULFAN	Y	N	0.22	0.056	0.034	0.0087	74ug	159ug	
ENDRIN	Y	N	0.18	0.0023	0.037	0.0023	1ug		0.0002mg
ETHYLBENZENE	Y	N					1.4mg	3.28mg	
FLUORANTHENE	Y	N					42ug	54ug	
GUTHION	N	N		0.01		0.01			
HALOETHERS	Y	N							
HALOMETHANES	Y	Y					0.19ug**	15.7ug**	
HEPTACHLOR	Y	Y	0.52	0.0038	0.053	0.0036	0.28ng**	0.29ng**	
HEXACHLOROETHANE	N	Y					1.9ug	8.74ug	
HEXACHLOROBENZENE	Y	N					0.72ng**	0.74ng**	
HEXACHLOROBUTADIENE	Y	Y					0.45ug**	50ug**	
HEXACHLOROCYCLOHEXANE (LINDANE)	Y	Y	2	0.08	0.16				0.004mg
HEXACHLOROCYCLOHEXANE-ALPHA	Y	Y					9.2ng**	31ng**	
HEXACHLOROCYCLOHEXANE-BETA	Y	Y					16.3ng**	54.7ng**	
HEXACHLOROCYCLOHEXANE-GAMA	Y	Y					18.6ng**	62.5ng**	
HEXACHLOROCYCLOHEXANE-TECHNICAL	Y	Y					12.3ng**	41.4ng**	
HEXACHLOROCYCLOPENTADIENE	Y	N					206ug		
IRON	N	N		1,000			0.3mg		
ISOPHORONE	Y	N					5.2mg	520mg	
LEAD	Y	N	82.+	3.2+	140	5.6	50ug		0.05mg
MALATHION	N	N		0.1		0.1			
MANGANESE	N	N					50ug	100ug	
MERCURY	Y	N	2.4	0.012	2.1	0.025	144ng	146ng	0.002mg
METHOXYCHLOR	N	N		0.03		0.03	100ug		0.1mg
MIREX	N	N		0.001		0.001			
MONOCHLOROBENZENE	Y	N					488ug		

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
NAPHTHALENE	Y	N							
NICKEL	Y	N	1,400.+	160+	75	8.3	13.4ug	100ug	
NITRATES	N	N					10mg		10mg
NITROBENZENE	Y	N					19.8mg		
NITROPHENOLS	Y	N							
NITROSAMINES	Y	Y					0.8ng**	1,240ng**	
NITROSODIBUTYLAMINE N	Y	Y					6.4ng**	587ng**	
NITROSODIETHYLAMINE N	Y	Y					0.8ng**	1,240ng**	
NITROSODIMETHYLAMINE N	Y	Y					1.4ng**	16,000ng**	
NITROSODIPHENYLAMINE N	Y	Y					4,900ng**	16,100ng**	
NITROSOPYRROLIDINE N	Y	Y					16ng**	91,900ng**	
PARATHION	N	N	0.065	0.013					
PCB's	Y	Y	2	0.014	10	0.03	0.079ng**	0.079ng**	
PENTACHLORINATED ETHANES	N	N							
PENTACHLOROBENZENE	N	N					74ug	85ug	
PENTACHLOROPHENOL	Y	N	***20	***13	13		1.01mg		
PHENOL	Y	N					3.5mg		
PHOSPHORUS ELEMENTAL	N	N				0.1			
PHTHALATE ESTERS	Y	N							
POLYNUCLEAR AROMATIC HYDROCARBONS	Y	Y					2.8ng**	31.1ng**	
SELENIUM	Y	N	260	35	410	54	10ug		0.01mg
SILVER	Y	N	4.1+	0.12	2.3		50ug		0.05mg
SULFIDE HYDROGEN SULFIDE	N	N		2		2			
TETRACHLORINATED ETHANES	Y	N							
TETRACHLOROBENZENE 1,2,4,5	Y	N					38ug	48ug	
TETRACHLOROETHANE 1,1,2,2	Y	Y					0.17ug**	10.7ug**	
TETRACHLOROETHANES	Y	N							
TETRACHLOROETHYLENE	Y	Y					0.8ug**	8.85ug**	
TETRACHLOROPHENOL 2,3,5,6	Y	N							
THALLIUM	Y	N					13ug	48ug	
TOLUENE	Y	N					14.3mg	424mg	
TOXAPHENE	Y	Y	0.73	0.0002	0.21	0.0002	0.71ng**	0.73ng**	0.005mg
TRICHLORINATED EtHANES	Y	Y							
TRICHLOROETHANE 1,1,1	Y	N					18.4mg	1.03g	
TRICHLOROETHANE 1,1,2	Y	Y					0.6ug**	41.8ug**	
TRICHLOROETHYLENE	Y	Y					2.7ug**	80.7ug**	

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

Compound Name (or Class)	Priority Pollutant	Carcinogen	Concentration in Micrograms Per Liter for Protection of Aquatic Life				Concentration in Units Per Liter for Protection of Human Health		
			Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria	Water and Fish Ingestion	Fish Consumption Only	Drinking Water M.C.L.
TRICHLOROPHENOL 2,4,5	N	N					2,600ug		
TRICHLOROPHENOL 2,4,6	Y	Y					1.2ug**	3.6ug**	
VINYL CHLORIDE	Y	Y					2ug**	525ug**	
ZINC	Y	N	120+	110+	95	86			

MEANING OF SYMBOLS:

g = grams

mg = milligrams

M.C.L = Maximum Contaminant Level

\+ = Hardness Dependent Criteria (100 mg/L used).
The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):
$CMC = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$
$CCC = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	0.7852	-3.49
Chromium III	0.819	3.688	0.819	1.561
Copper	0.9422	-1.464	0.8545	-1.465
Lead	1.273	-1.46	1.273	-4.705
Nickel	0.846	3.3612	0.846	1.1645
Silver	1.72	-6.52		
Zinc	0.8473	0.8604	0.8473	0.7614

TABLE 20

WATER QUALITY CRITERIA SUMMARY (Continued)

ug	=	micrograms	*	=	Insufficient data to develop criteria; value presented is the L.O.E.L – Lower Observed Effect Level.
ng	=	nanograms	**	=	Human health criteria for carcinogens reported for three risk levels. Value presented is the 10-6 risk level, which means the probability of one concern case per million people at the stated concentration.
pg	=	picograms	***	=	pH Dependent Criteria (7.8 pH used).
f	=	fibers			
Y	=	Yes			
N	=	No			

1 = Values in Table 20 are applicable to all basins.

Water and Fish Ingestion

Values represent the maximum ambient water concentration for consumption of both contaminated water and fish or other aquatic organisms.

Fish Ingestion

Values represent the maximum ambient water concentrations for consumption of fish or other aquatic organisms

TABLE 33A

Note: The Environmental Quality Commission adopted the following criteria on May 20, 2004 to become effective February 15, 2005. However, EPA has not yet (as of June 2006) approved the criteria. Thus, Table 33A criteria may be used in NPDES permits, but not for the section 303(d) list of impaired waters.

WATER QUALITY CRITERIA SUMMARY[A]

The concentration for each compound listed in Table 33A is a criterion not to be exceeded in waters of the state in order to protect aquatic life and human health. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), the Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic criteria, aquatic life saltwater acute and chronic criteria, human health water & organism and organism only criteria, and Drinking Water Maximum Contaminant Level (MCL). The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
56	Acenaphthene		83329									670		990		
57	Acenaphthylene		208968													
17	Acrolein		107028									190		290		
18	Acrylonitrile		107131									0.051		0.250		
102	Aldrin		309002	3 O	X			1.3 O	X			0.000049		0.000050		
1 N	Alkalinity					20,000 P										
2 N	Aluminum (pH 6.5 - 9.0)		7429905													
3 N	Ammonia		7664417					D	X	D	X					
58	Anthracene		120127									8300		40000		
1	Antimony		7440360									5.6		640		
2	Arsenic		7440382													0.05mg
15	Asbestos		1332214													
6 N	Barium		7440393									1000				1.0mg
19	Benzene		71432													
59	Benzidine		92875									0.000086		0.00020		
60	Benzo(a)Anthracene		56553									0.0038		0.018		
61	Benzo(a)Pyrene		50328									0.0038		0.018		
62	Benzo(b)Fluoranthene		205992									0.0038		0.018		
63	Benzo(g,h,i)Perylene		191242													

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
64	Benzo(k)Fluoranthene		207089									0.0038		0.018		
3	Beryllium		7440417													
103	BHC alpha-		319846									0.0026		0.0049		
104	BHC beta-		319857									0.0091		0.017		
106	BHC delta-		319868													
105	BHC gamma- (Lindane)		58899	0.95		0.08	X	0.16 O								0.004mg
7 N	Boron		7440428													
20	Bromoform		75252									4.3		140		
69	Bromophenyl Phenyl Ether 4-															
70	Butylbenzyl Phthalate		85687									1500		1900		
4	Cadmium		7440439													0.010mg
21	Carbon Tetrachloride		56235									0.23		1.6		
107	Chlordane		57749	2.4 O	X	0.0043 O	X	0.09 O	X	0.004 O	X					
8 N	Chloride		16887006	860000		230000										
9 N	Chlorine		7782505	19	X	11	X	13	X	7.5	X					
22	Chlorobenzene		108907									130		1600		
23	Chlorodibromomethane		124481									0.40		13		
24	Chloroethane		75003													
65	ChloroethoxyMethane Bis2-		111911													
66	ChloroethylEther Bis2-		111444									0.030		0.53		
25	Chloroethylvinyl Ether 2-		110758													
26	Chloroform		67663													
67	ChloroisopropylEther Bis2-		108601													
15 N	ChloromethylEther, Bis		542881											0.00029		
71	Chloronaphthalene 2-		91587									1000		1600		
45	Chlorophenol 2-		95578									81		150		
10 N	Chlorophenoxy Herbicide (2,4,5,-TP)		93721									10 H				

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
11 N	Chlorophenoxy Herbicide (2,4-D)		94757									100 H				
72	Chlorophenyl Phenyl Ether 4-		7005723													
12 N	Chloropyrifos		2921882	0.083	X	0.041	X	0.011	X	0.0056	X					
5a	Chromium (III)															0.05mg
5b	Chromium (VI)		18540299													0.05mg
73	Chrysene		218019									0.0038		0.018		
6	Copper		7440508									1300 H				
14	Cyanide		57125	22 S	X	5.2 S	X	1 S	X	1 S	X	140		140		
108	DDT 4,4'-		50293	1.1 O,T	X	0.001 O,T	X	0.13 O,T	X	0.001 O,T	X					
109	DDE 4,4'-		72559									0.00022		0.00022		
110	DDD 4,4'-		72548									0.00031		0.00031		
14 N	Demeton		8065483			0.1	X			0.1	X					
74	Dibenzo(a,h)Anthracene		53703									0.0038		0.018		
75	Dichlorobenzene 1,2-		95501									420		1300		
76	Dichlorobenzene 1,3-		541731									320		960		
77	Dichlorobenzene 1,4-		106467									63		190		
78	Dichlorobenzidine 3,3'-		91941									0.021		0.028		
27	Dichlorobromomethane		75274									0.55		17		
28	Dichloroethane 1,1-		75343													
29	Dichloroethane 1,2-		107062									0.38		37		
30	Dichloroethylene 1,1-		75354									330		7100		
46	Dichlorophenol 2,4-		120832									77		290		
31	Dichloropropane 1,2-		78875									0.50		15		
32	Dichloropropene 1,3-		542756									0.34		21		
111	Dieldrin		60571	0.24				0.71 O	X	0.0019 O	X	0.000052		0.000054		
79	DiethylPhthalate		84662									17000		44000		
47	Dimethylphenol 2,4-		105679									380		850		

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
80	DimethylPhthalate		131113									270000		1100000		
81	Di-n-Butyl Phthalate		84742									2000		4500		
49	Dinitrophenol 2,4-		51285									69		5300		
27 N	Dinitrophenols		25550587									69		5300		
82	Dinitrotoluene 2,4-		121142									0.11		3.4		
83	Dinitrotoluene 2,6-		606202													
84	Di-n-Octyl Phthalate		117840													
16	Dioxin (2,3,7,8-TCDD)		1746016									5.0E-09		5.1E-09		
85	Diphenylhydrazine 1,2-		122667									0.036		0.20		
68	EthylhexylPhthalate Bis2-		117817									1.2		2.2		
	Endosulfan			0.22 I,P	X	0.056 I,P	X	0.034 I,P	X	0.0087 I,P	X	62 I		89 I		
112	Endosulfan alpha-		959988	0.22 O		0.056 O		0.034 O		0.0087 O		62		89		
113	Endosulfan beta-		33213659	0.22 O		0.056 O		0.034 O		0.0087 O		62		89		
114	Endosulfan Sulfate		1031078									62		89		
115	Endrin		72208	0.086				0.037 O		0.0023 O		0.059		0.060		0.0002mg
116	Endrin Aldehyde		7421934									0.29		0.30		
33	Ethylbenzene		100414									530		2100		
86	Fluoranthene		206440													
87	Fluorene		86737									1100		5300		
17 N	Guthion		86500			0.01	X			0.01	X					
117	Heptachlor		76448	0.52 O	X	0.0038 O	X	0.053 O	X	0.0036 O	X	0.000079		0.000079		
118	Heptachlor Epoxide		1024573	0.52 O		0.0038 O		0.053 O		0.0036 O		0.000039		0.000039		
88	Hexachlorobenzene		118741									0.00028		0.00029		

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
89	Hexachlorobutadiene		87683									0.44		18		
91	Hexachloroethane		67721									1.4		3.3		
19 N	Hexachlorocyclo-hexane-Technical		319868									0.0123 J		0.0414 J		
90	Hexachlorocyclopentadiene		77474									40		1100		
92	Ideno1,2,3-(cd)Pyrene		193395									0.0038		0.018		
20 N	Iron		7439896			1,000	X									
93	Isophorone		78591									35		960		
7	Lead		7439921													0.05mg
21 N	Malathion		121755			0.1	X			0.1	X					
22 N	Manganese		7439965													
8a	Mercury		7439976	2.4	X	0.012	X	2.1	X	0.025	X					0.002mg
23 N	Methoxychlor		72435			0.03	X			0.03	X	100 J				0.1mg
34	Methyl Bromide		74839									47		1500		
35	Methyl Chloride		74873													
48	Methyl-4,6-Dinitrophenol 2-		534521									13		280		
52	Methyl-4-Chlorophenol 3-		59507													
36	Methylene Chloride		75092									4.6		590		
8b	Methylmercury		22967926											300ug/kg L		
24 N	Mirex		2385855			0.001	X			0.001	X					
94	Naphthalene		91203													
9	Nickel		7440020													
25 N	Nitrates		14797558									10000 J				10mg
95	Nitrobenzene		98953									17		690		
50	Nitrophenol 2-		88755													

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
51	Nitrophenol 4-		100027													
26 N	Nitrosamines		35576911									0.0008 J		1.24 J		
28 N	Nitrosodibutylamine,N		924163									0.0063		0.22		
29 N	Nitrosodiethylamine,N		55185									0.0008 J		1.24 J		
96	N-Nitrosodimethylamine		62759									0.00069		3.0		
98	N-Nitrosodiphenylamine		86306									3.3		6.0		
30 N	Nitrosopyrrolidine,N		930552									0.016		34		
97	N-Nitrosodi-n-Propylamine		621647									0.0050		0.51		
32 N	Oxygen, Dissolved		7782447													
33 N	Parathion		56382	0.065	X	0.013	X									
119	Polychlorinated Biphenyls PCBs:		1336363	2 U	X	0.014 U	X	10 U	X	0.03 U	X	0.000064 U		0.000064 U		
34 N	Pentachlorobenzene		608935									1.4		1.5		
53	Pentachlorophenol		87865	M				13		7.9		0.27		3.0		
99	Phenanthrene		85018													
54	Phenol		108952											1700000		
36 N	Phosphorus Elemental		7723140							0.1						
100	Pyrene		129000									830		4000		
10	Selenium		7782492											4200		0.01mg
11	Silver		7440224													0.05mg
40 N	Sulfide-Hydrogen Sulfide		7783064			2	X			2	X					
43 N	Tetrachlorobenzene,1,2,4,5		95943									0.97		1.1		

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:				
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date	Drinking Water M.C.L.
37	Tetrachloroethane 1,1,2,2-		79345									0.17		4.0		
38	Tetrachloroethylene		127184									0.69		3.3		
12	Thallium		7440280									0.24		0.47		
39	Toluene		108883									1300		15000		
120	Toxaphene		8001352	0.73	X	0.0002	X	0.21	X	0.0002	X	0.00028		0.00028		0.005mg
40	Trans-Dichloroethylene 1,2-		156605									140		10000		
44 N	Tributyltin (TBT)		688733													
101	Trichlorobenzene 1,2,4-		120821									35		70		
41	Trichloroethane 1,1,1-		71556													
42	Trichloroethane 1,1,2-		79005									0.59		16		
43	Trichloroethylene		79016									2.5		30		
45 N	Trichlorophenol 2,4,5		95954									1800		3600		
55	Trichlorophenol 2,4,6-		88062											2.4		
44	Vinyl Chloride		75014									0.025		2.4		
13	Zinc		7440666									7400		26000		

Footnotes for Tables 33A and 33B:

A Values in Table 20 are applicable to all basins.

B Human Health criteria values were calculated using a fish consumption rate of 17.5 grams per day (0.6 ounces/day) unless otherwise noted.

C Ammonia criteria for freshwater may depend on pH, temperature, and the presence of salmonids or other fish with ammonia-sensitive early life stages. Values for freshwater criteria (of total ammonia nitrogen in mg N/L) can be calculated using the formulae specified in *1999 Update of Ambient Water Quality Criteria for Ammonia* (EPA-822-R-99-014; http://www.epa.gov/ost/standards/ammonia/99update.pdf):
Freshwater Acute:

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

WATER QUALITY CRITERIA SUMMARY (Continued)

salmonids not present…CMC= $\frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$

Freshwater Chronic:

fish early life stages present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN(2.85, 1.45*10^{0.028*(25-T)})$$

fish early life stages not present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * 1.45*10^{0.028*(25-MAX(T,7))}$$

Note: these chronic criteria formulae would be applied to calculate the 30-day average concentration limit; in addition, the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC.

D Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in *Ambient Water Quality Criteria for Ammonia (Saltwater)--1989* (EPA 440/5-88-004; http://www.epa.gov/ost/pc/ambientwqc/ammoniasalt1989.pdf).

E Freshwater and saltwater criteria for metals are expressed in terms of "dissolved" concentrations in the water column, except where otherwise noted (e.g. aluminum).

F The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):

$$CMC = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$$

$$CCC = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$$

where CF is the conversion factor used 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.

WATER QUALITY CRITERIA SUMMARY (Continued)

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.0166	-3.924	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59		
Zinc	0.8473	0.884	0.8473	0.884

Conversion factors (CF) for dissolved metals (the values for total recoverable metals criteria were multiplied by the appropriate conversion factors shown below to calculate the dissolved metals criteria):

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.136672-[(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
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

G Human Health criterion is the same as originally published in the 1976 EPA Red Book (Quality Criteria for Water, EPA-440/9-76-023) which predates the 1980 methodology and did not use the fish ingestion BCF approach.

H This value is based on a Drinking Water regulation.

I This value is based on criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.

J No BCF was available; therefore, this value is based on that published in the 1986 EPA Gold Book.

WATER QUALITY CRITERIA SUMMARY (Continued)

K Human Health criterion is for "dissolved" concentration based on the 1976 EPA Red Book conclusion that adverse effects from exposure at this level are aesthetic rather than toxic.

L This value is expressed as the fish tissue concentration of methylmercury.

M Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).

N This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

O This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines for minimum data requirements and derivation procedures. 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.

P Criterion shown is the minimum (i.e. CCC in water should not be below this value in order to protect aquatic life).

Q Criterion is applied as total arsenic (i.e. arsenic (III) + arsenic (V)).

R Arsenic criterion refers to the inorganic form only.

S This criterion is expressed as µg free cyanide (CN)/L.

T This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).

U This criterion applies to total PCBs (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).

V 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 12.82 µg/L, respectively.

W The acute and chronic criteria for aluminum are 750 µg/L and 87 µg/L, respectively. These values for aluminum are expressed in terms of "total recoverable" concentration of metal in the water column. The criterion applies at pH<6.6 and hardness<12 mg/L (as $CaCO_3$).

X The effective date for the criterion in the column immediately to the left is 1991.

Y No criterion.

TABLE 33B

Note: The Environmental Quality Commission adopted the following criteria on May 20, 2004 to become effective on EPA approval. EPA has not yet (as of June 2006) approved these criteria. The Table 33B criteria may not be used until they are approved by EPA.

WATER QUALITY CRITERIA SUMMARY[A]

The concentration for each compound listed in Table 33A is a criterion not to be exceeded in waters of the state in order to protect aquatic life and human health. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), the Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic criteria, aquatic life saltwater acute and chronic criteria, human health water & organism and organism only criteria, and Drinking Water Maximum Contaminant Level (MCL). The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:			
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date
2 N	Aluminum (pH 6.5 - 9.0)		7429905	W		W									
3 N	Ammonia		7664417	C		C									
2	Arsenic		7440382									0.018 R		0.14 R	
15	Asbestos		1332214									7.0E+06 fibers/Liter			
19	Benzene		71432									2.2		51	
3	Beryllium		7440417									Y		Y	
105	BHC gamma- (Lindane)		58899									0.98		1.8	
4	Cadmium		7440439	E,F		E,F		40 E		8.8 E		Y			
107	Chlordane		57749									0.00080		0.00081	
	CHLORINATED BENZENES											Y		Y	
26	Chloroform		67663									5.7		470	
67	ChloroisopropylEther Bis2-		108601									1400		65000	
15 N	ChloromethylEther, Bis		542881									0.00010			
5a	Chromium (III)			E,F		E,F						Y			
5b	Chromium (VI)		18540299	16 E		11 E						Y		Y	
6	Copper		7440508	E,F		E,F		4.8 E		3.1 E					
108	DDT 4,4'-		50293									0.00022		0.00022	
	DIBUTYLPHTHALATE											Y		Y	
	DICHLOROBENZENES											Y		Y	
	DICHLOROBENZIDINE											Y		Y	
	DICHLOROETHYLENES											Y		Y	
	DICHLOROPROPENE											Y		Y	
111	Dieldrin		60571			0.056									

WATER QUALITY CRITERIA SUMMARY (Continued)

EPA No.	Compound		CAS Number	Freshwater				Saltwater				Human Health For Consumption of:			
				Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Water + Organism[B]	Effective Date	Organism only[B]	Effective Date
	DINITROTOLUENE											Y		Y	
	DIPHENYLHYDRAZINE											Y		Y	
115	Endrin		72208			0.036									
86	Fluoranthene		206440									130		140	
	HALOMETHANES											Y		Y	
20 N	Iron		7439896									300 K			
7	Lead		7439921	E,F		E,F		210 E		8.1 E		Y			
22 N	Manganese		7439965									50 K		100 K	
8a	Mercury		7439976									Y		Y	
	MONOCHLOROBENZENE											Y		Y	
9	Nickel		7440020	E,F		E,F		74 E		8.2 E		610		4600	
53	Pentachlorophenol		87865			M									
54	Phenol		108952									21000			
	POLYNUCLEAR AROMATIC HYRDOCARBONS											Y		Y	
10	Selenium		7782492	E,V		5 E		290 E		71 E		170			
11	Silver		7440224	E,F,P		0.10 E		1.9 E,P				Y			
44 N	Tributyltin (TBT)		688733	0.46		0.063		0.37		0.01					
41	Trichloroethane 1,1,1-		71556									Y		Y	
55	Trichlorophenol 2,4,6-		88062									1.4			
13	Zinc		7440666	E,F		E,F		90 E		81 E					

Footnotes for Tables 33A and 33B:

A Values in Table 20 are applicable to all basins.

B Human Health criteria values were calculated using a fish consumption rate of 17.5 grams per day (0.6 ounces/day) unless otherwise noted.

C Ammonia criteria for freshwater may depend on pH, temperature, and the presence of salmonids or other fish with ammonia-sensitive early life stages. Values for freshwater criteria (of total ammonia nitrogen in mg N/L) can be calculated using the formulae specified in *1999 Update of Ambient Water Quality Criteria for Ammonia* (EPA-822-R-99-014; http://www.epa.gov/ost/standards/ammonia/99update.pdf):

Freshwater Acute:

WATER QUALITY CRITERIA SUMMARY (Continued)

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

salmonids not present…CMC= $\frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$

Freshwater Chronic:

fish early life stages present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * MIN(2.85, 1.45*10^{0.028*(25-T)})$$

fish early life stages not present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) * 1.45*10^{0.028*(25-MAX(T,7))}$$

Note: these chronic criteria formulae would be applied to calculate the 30-day average concentration limit; in addition, the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC.

D Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in *Ambient Water Quality Criteria for Ammonia (Saltwater)--1989* (EPA 440/5-88-004; http://www.epa.gov/ost/pc/ambientwqc/ammoniasalt1989.pdf).

E Freshwater and saltwater criteria for metals are expressed in terms of "dissolved" concentrations in the water column, except where otherwise noted (e.g. aluminum).

F The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):

$$CMC = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$$

$$CCC = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$$

where CF is the conversion factor used 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.

WATER QUALITY CRITERIA SUMMARY (Continued)

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.0166	-3.924	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59		
Zinc	0.8473	0.884	0.8473	0.884

Conversion factors (CF) for dissolved metals (the values for total recoverable metals criteria were multiplied by the appropriate conversion factors shown below to calculate the dissolved metals criteria):

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.136672-[(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
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

G Human Health criterion is the same as originally published in the 1976 EPA Red Book (Quality Criteria for Water, EPA-440/9-76-023) which predates the 1980 methodology and did not use the fish ingestion BCF approach.

H This value is based on a Drinking Water regulation.

I This value is based on criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.

J No BCF was available; therefore, this value is based on that published in the 1986 EPA Gold Book.

K Human Health criterion is for "dissolved" concentration based on the 1976 EPA Red Book conclusion that adverse effects from exposure at this level are aesthetic rather than toxic.

WATER QUALITY CRITERIA SUMMARY (Continued)

L This value is expressed as the fish tissue concentration of methylmercury.

M Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).

N This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

O This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines for minimum data requirements and derivation procedures. 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.

P Criterion shown is the minimum (i.e. CCC in water should not be below this value in order to protect aquatic life).

Q Criterion is applied as total arsenic (i.e. arsenic (III) + arsenic (V)).

R Arsenic criterion refers to the inorganic form only.

S This criterion is expressed as µg free cyanide (CN)/L.

T This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).

U This criterion applies to total PCBs (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).

V 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 12.82 µg/L, respectively.

W The acute and chronic criteria for aluminum are 750 µg/L and 87 µg/L, respectively. These values for aluminum are expressed in terms of "total recoverable" concentration of metal in the water column. The criterion applies at pH<6.6 and hardness<12 mg/L (as $CaCO_3$).

X The effective date for the criterion in the column immediately to the left is 1991.

Y No criterion.