

7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding CDDs in air, water, and other media are summarized in Table 7-1.

It is ATSDR's policy (see Appendix B) to use health guidance values (i.e., MRLs and EMEGs) derived for 2,3,7,8-TCDD for other dioxin-like compounds expressed as total TEQs.

ATSDR has derived an acute-duration oral MRL of 0.0002 $\mu\text{g}/\text{day}$ (2×10^{-4} $\mu\text{g}/\text{kg}/\text{day}$) for 2,3,7,8-TCDD based on its ability to suppress serum total hemolytic complement activity in B6C3F₁ mice (White et al. 1986).

An intermediate-duration oral MRL of 0.00002 $\mu\text{g}/\text{day}$ (2×10^{-5} $\mu\text{g}/\text{kg}/\text{day}$) was derived based on observed decreases in thymus weight in guinea pigs (Decaprio et al. 1986).

A chronic-duration oral MRL of 0.000001 $\mu\text{g}/\text{day}$ (1×10^{-6} $\mu\text{g}/\text{kg}/\text{day}$) was derived for 2,3,7,8-TCDD based on altered social interactions with peers in monkeys exposed to 2,3,7,8-TCDD prenatally and during lactation (Schantz et al. 1992).

Neither a reference concentration (RfC) nor a reference dose (RfD) is listed in IRIS (IRIS 1998) for any of the CDDs.

The IRIS database does not contain a weight-of evidence cancer classification for 2,3,7,8-TCDD. The EPA is currently in the final stages of re-evaluating the risks and hazards from exposures to CDDs and CDD-like-like compounds. In its proposed rule to add a chemical category that includes dioxin and dioxin-like compounds to the list of toxic chemicals subject to release reporting requirements, EPA acknowledged that existing data shows "2,3,7,8-TCDD is a potent toxicant in animals and has the potential to produce a wide spectrum of toxic effects in humans" (EPA 1997c). In the preamble of the rule EPA further states that "Available human data cannot clearly demonstrate whether a cause and effect relationship exists between 2,3,7,8-TCDD exposure and increased incidence of cancer. However, there are a number of epidemiological studies associating exposure to 2,3,7,8-TCDD with cancer mortality" (EPA 1997c). Making reference to the 1985 cancer slope factor (1.56×10^5 [$\text{mg}/\text{kg}/\text{day}$]⁻¹) (EPA 1985d) for

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2,3,7,8-TCDD and considering its own weight-of-evidence classification criteria, EPA states that “there is sufficient evidence to conclude that the compound is a probable human carcinogen” (EPA 1997c). In February, 1997, the International Agency for Research on Cancer (IARC) evaluated the evidence for CDDs being risk factors for human cancer (IARC 1997). Consequently, IARC currently identifies 2,3,7,8-TCDD as being carcinogenic to humans; Group 1 carcinogen (IARC 1997). IARC concluded that there is limited evidence in humans for the carcinogenicity of 2,3,7,8-TCDD; however, data from studies involving experimental animals provided sufficient evidence of carcinogenicity. Giving consideration to supporting evidence such as 2,3,7,8-TCDD being a multi-site carcinogen in experimental animals; its acting through a mechanism involving Ah receptor which functions the same way in humans as in experimental animals; and similar tissue concentrations both in heavily exposed human populations and rats exposed to carcinogenic dosages, IARC’s overall evaluation for 2,3,7,8-TCDD is that it is carcinogenic to humans (IARC 1997). The Department of Health and Human Services (DHHS), National Toxicology Program (NTP) considers it to be a substance that is “reasonably anticipated to be a carcinogen.” Again, the supporting data indicate that the evidence of 2,3,7,8-TCDD carcinogenicity in humans is limited, but that there is sufficient evidence of carcinogenic effects in studies involving experimental animals (NTP 1998). NTP is currently considering a reclassification of 2,3,7,8-TCDD and the decision is pending.

EPA regulates dioxins as hazardous air pollutants (HAPs) in accordance with the provisions of the Clean Air Act (CAA). EPA has promulgated guidelines and performance standards limiting dioxin and other HAP emissions from various sources (i.e., major, stationary, and area). A wide variety of health effects (e.g., cancer, respiratory problems, developmental and/or reproductive effects) have been associated with exposure to HAP emissions (EPA 1998c). Some of the sources for which EPA has most recently promulgated or proposed guidelines and standards under the authority of the CAA are municipal waste combustors (MWCs), hospital/medical/infectious/waste combustors (HMIWI), and process operations in the Portland Cement industry (EPA 1997a, 1997b, 1998c).

Owners and operators of facilities that have chemicals subject to "The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986" on their sites in amounts exceeding a designated “reporting threshold level” are required to annually report releases of such chemicals to any environmental media (U.S. Congress 1986). On May 7, 1997, EPA proposed adding a chemical category that includes dioxin and 27 dioxin-like compounds to the list of toxic chemicals subject to the EPCRA reporting requirements (EPA 1997c).

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2,3,7,8-TCDD is also regulated as a drinking water contaminant. As an impurity in the production of some pesticides, 2,3,7,8-TCDD may get into drinking water by industrial discharge of waste. EPA has set a drinking water standard (Maximum Contaminant Level [MCL]) for dioxin at 3×10^{-8} ppm (EPA 1994d). People who drink water containing dioxin in excess of the MCL over many years could experience problems with their reproductive systems and may have an increased risk of cancer (EPA 1998d). There is little to no risk associated with drinking-water that meets the MCL (EPA 1994d). In February 1998, as mandated by the Safe Drinking Water Act (SDWA), EPA issued a proposed rule that would require community water systems to inform the public as to the quality of the water delivered by the system (EPA 1998). The community right-to-know provisions of the SDWA mandate a reporting which informs the public of where their water comes from, shows them the process by which safe drinking water is delivered to their homes, provide access to information concerning source water assessments, and allows them to make informed decisions about their drinking water (EPA 1998d). The SDWA provisions also include requirements for timely notifications of violations. Within 24 hours, people served by public water systems must be notified of any violations of the national drinking water standard that have the potential to have serious adverse health effects (EPA 1998d). The SDWA amendments of 1996 required the FDA to issue monitoring requirements for nine allowable contaminants in bottled water (FDA 1998a, 1998b). 2,3,7,8-TCDD is included among these nine chemicals.

2,3,7,8-TCDD is regulated by the Clean Water Effluent Guidelines for the following industrial point sources: electroplating (EPA 1981a), steam electric power generating (EPA 1982a), and metal finishing (EPA 1986g). Limitations depend on the type of industry and plant. If waters and their sediments become contaminated from sources such as atmospheric deposition and discharges from industrial, municipal, or agricultural operations, toxic substances could concentrate in the tissue of fish and wildlife. Sixty-six advisories have been issued by 21 states recommending consumers limit their consumption of fish and shellfish (EPA 1998b). For 14 states (Wisconsin, Rhode Island, New Hampshire, West Virginia, Louisiana, Arkansas, Virginia, Michigan, Mississippi, Florida, Massachusetts, Oregon, Tennessee, and Delaware) advisories were issued for freshwater fish (EPA 1998b). Only two states (Texas and California) issued advisories for marine waters only (EPA 1998b). An advisory for woodduck (migratory fowl) was issued for the state of Arkansas. This information is current as of December 1997, based on the EPA Fish and Wildlife Advisory Database searched October 1998 at: <http://www.epa.gov/OST/fishadvice/>. More detailed information can be obtained from the state Public Health Department or the state Department of Natural Resources. A fish or wildlife advisory will specify the bodies of water or hunting areas with restrictions. The advisory will indicate what species and size of fish or game are of concern. The advisory

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may completely ban consumption or recommend limiting meals of a certain fish or wildlife species to a particular frequency. For example, an advisory may recommend that a person eat a certain type of fish no more than once a month. The advisory may indicate that only certain parts of the fish or game should be consumed and recommend preparation methods that minimize exposure. Fish and wildlife advisories may also provide restrictions specifically targeting pregnant women, nursing mothers, and young children. Each state, Native American Tribe, or U.S. Territory chooses its own criteria for issuing fish and wildlife advisories.

2,3,7,8-TCDD is regulated as a hazardous waste constituent under the requirements of the Resource Conservation and Recovery Act (RCRA) (EPA 1988d). Non-specific sources of 2,3,7,8-TCDD-containing waste are wastes from the production or manufacturing use of tri-, tetra-, or pentachlorophenols and their pesticide derivatives, discarded or unused formulations containing these compounds, and residues from incineration or thermal treatment of soil contaminated with these compounds. RCRA prohibits land disposal of hazardous waste unless it meets treatment standards established by the EPA. On May 12, 1997, the EPA promulgated universal treatment standards (UTSs) for hazardous constituents in wood preserving waste. These wastes have been assigned EPA hazardous waste codes F032, F034, and F035 (EPA 1997d). The final rule also promulgated a compliance alternative for dioxin constituents in nonwastewater and wastewater forms of F032 waste which allowed combustion to be used as a method of treatment (EPA 1997d).

The Toxic Substance Control Act (TSCA) authorizes the EPA to determine whether the use of a chemical substance is a “significant new use” (EPA 1998e). Once it has been determined that a use of a chemical is a significant new use, it must be reported to the EPA prior to manufacturing, importing, or processing for the new use. The required notice will provide the EPA with an opportunity to evaluate the intended use, and if necessary, to prohibit or limit the activity before it occurs (EPA 1998e). For example, brominated phthalate ester was included among the 163 chemical substances for which the EPA promulgated significant new use rules (SNURs). The toxicity concern for the new use was that when similar chemicals have been incinerated under combustion conditions of municipal incinerators, dibenzodioxins and dibenzofurans were formed (EPA 1998e). Persons providing notice of this new use would need to characterize, through an incineration simulation, the potential for dioxin and furan formation and agree not to exceed the production volume limit without performing the characterization (EPA 1998e).

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Table 7-1. Regulations and Guidelines Applicable to CDDs

Agency	Description	Information	References
<u>INTERNATIONAL</u>			
IARC	Carcinogenic classification (2,3,7,8-TCDD)	Group 1 ^a	IARC 1997
WHO	Total daily intake (TDI) range 2,3,7,8-TCDD or total TEQs	1-4 pg /kg body weight	WHO 1998a WHO 1998b
HCN	Health-based exposure limit (2,3,7,8-TCDD or total TEQs)	1 pg/kg/day	HCN 1996
<u>NATIONAL</u>			
a. Air:			
OSHA	Meets criteria for OSHA medical records (2,3,7,8-TCDD)	Yes	29 CFR 1910.20 OSHA 1987
EPA OAR	Section 112(b) Hazardous Air Pollutant	Yes	Clean Air Act Amendments U.S. Congress 1990
	Standards of Performance for New Stationary Sources	Yes	40 CFR 60, Subpart Cb EPA 1995b
	Emission guidelines an compliance times for municipal waste combustors		
	Emissions Guideline for existing sources and standards of performance for new stationary sources: Large municipal waste combustion units; Final rule	Yes	62 FR 45124 EPA 1997f
	Municipal waste combustors constructed between December 20, 1989 and September 20, 1994	Yes	40 CFR 60, Subpart Ea EPA 1995f
	Municipal waste combustors constructed after September 20, 1994	Yes	40 CFR 60, Subpart Eb EPA 1995d
	Large municipal waste combustion units; emission guidelines; Final rule	Yes	62 FR 45116 EPA 1997a
	National Emission Standards for Hazardous Air Pollutants for Source Categories Wood Furniture Operations	Yes	40 CFR 63, Subpart JJ EPA 1995e
	Hazardous Waste Combustors; Revised Standards—Final rule	Yes	63 FR 33782 EPA 1998i
b. Water:			
EPA OW	Regulated under SDWA of 1986 (2,3,7,8- TCDD)	Yes	FSTRAC 1990
	Guidelines Establishing Test Procedures for the Analysis of Pollutants; EPA Method 1613	Yes	62 FR 48394 EPA 1997g
	Maximum Contaminant Level—2,3,7,8- TCDD (Dioxin)	3.0x10 ⁻⁸ mg/L	40 CFR 141 EPA 1994d
	EPA drinking water standard		
	Variances and exemptions from the maximum contaminant levels for organic and inorganic chemicals—Best available technologies	Treatment technology required is granular activated carbon	40 CFR 142.62 EPA 1994e

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
	Permit required for underground injection of 2,3,7,8-TCDD containing wastes designated hazardous under RCRA	Yes	40 CFR 144.1 EPA 1983a
	Hazardous Waste Injection Restrictions Waste specific prohibitions; dioxin-containing wastes	Yes	40 CFR 148.11 EPA 1988h
	Hazardous Waste Injection Restrictions: Treatment Standards for Hazardous Wastes (proposed) (TCDD, PCDD, HCDD)	<1 ppb	40 CFR 148 EPA 1993b
	General pretreatment regulations for existing and new sources of pollution (2,3,7,8-TCDD)	Yes	40 CFR 403.2, App. B EPA 1986d
	Application for an National Pollutant Discharge Elimination System permit (TCDD)	Yes	40 CFR 122.21 EPA 1983b
	Designated as a toxic pollutant under Section 307(a)(1) of the Federal Water Pollution Control Act and is subject to effluent limitations (2,3,7,8-TCDD)	Yes	40 CFR 401.15 EPA 1979c
	Electroplating Point Source Category General definition	Yes	40 CFR 413.02 EPA 1981a
	Steam Electric Power Generating Point Source Category Pretreatment standards for new sources (PSNS)	Yes	40 CFR 423.17 EPA 1982a
	Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Transportation Equipment Cleaning Point source Category—Proposed rule	Yes	63 FR 34686 EPA 1998f
	Effluent Limitations Guidelines, Pretreatment Standards, and new source performance Standards for the Industrial Waste Combustor Subcategory of the Waste Combustors Point source Category—Proposed rule	Yes	63 FR 6392 EPA 1998g
	Effluent Limitations Guidelines, Pretreatment Standards, and New Source Performance Standards for the Landfill Point source Category— Proposed rule	Yes	63 FR 6426 EPA 1998h
	2,3,7,8-TCDD Excluded from Subcategory 1 - Organic Pesticide Chemicals Manufacturing Regulations	Yes	40 CFR 455 EPA 1978

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
<u>NATIONAL (cont.)</u>			
c. Food:			
EPA	Tolerances and exemptions from tolerances for pesticide chemicals in or on raw agricultural commodities concentration limit of 2,3,7,8-TCDD in technical grade hexachlorophene	0.1 ppm	40 CFR 180.302 EPA 1971b
FDA	Requirements for Specific Standardized Beverages Bottled water	3×10 ⁻⁸ mg/L	21 CFR 165.110 FDA 1995
	Analysis to determine compliance—Methods for Chemical Analysis of Water and Waste	Method 1613	
d. Other:			
DOT	Designated as a hazardous material subject to requirements for packaging, labeling, and transportation (dioxins)	Yes	49 CFR 172.101, App. A DOT 1989b
EPA OERR	Regulated under the MPRSA; ocean dumping prohibited except when in trace amounts (2,3,7,8-TCDD)	Yes	40 CFR 227.6 EPA 1977
	Reportable quantity (2,3,7,8-TCDD)	1 pound	40 CFR 302.4 EPA 1985g
	Addition of Dioxin and Dioxin-like Compounds; Toxic Chemical Release Reporting; Community Right-to-Know—Proposed rule	Yes	62 FR 24887 EPA 1997c
EPA OPTS	TSCA regulates the use, disposal, and distribution in commerce of process waste water treatment sludges intended for land application from pulp and paper mills employing chlorine or chlorine derivative based bleaching processes (2,3,7,8-TCDD)	Yes	40 CFR 744 EPA 1991f
EPA OSW	Identification and Listing of Hazardous Wastes: (F033) Hazardous Wastes from Non-specific Sources (proposed) (TCDD, PCDD, HxCDD, HpCDD, OcCDD)	Yes	58 FR 25706 40 CFR 261.31 EPA 1993c
	Listing as a hazardous constituent (2,3,7,8-TCDD)	Yes	40 CFR 261, App. VIII EPA 1988d
	Hazardous Waste Combustors; Revised Standards—Final rule	Yes	63 FR 33782 (40 CFR 262 and 270) EPA 1998i
	Identification and Listing of Hazardous Wastes: Wastes Excluded Under 260.20 and 260.22 (TCDD, PCDD, HxCDD, HpCDD)	Yes	40 CFR 261, App. IX EPA 1984d

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
NATIONAL (cont.)			
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities Performance standards for incinerators	Yes	40 CFR 264.343 EPA 1981b
	Groundwater monitoring requirement (dioxins)	Yes	40 CFR 264, App. IX EPA 1987b
	Recyclable Materials Used in a Manner Constituting Disposal Standards applicable to users	Yes	40 CFR 266.23 EPA 1985h
	Interim status standards for burners	Yes	40 CFR 266.103 EPA 1991g
	Standards to control organic emissions, hazardous waste codes F021, F022, F023, F026, and F027	99.9999% DRE	40 CFR 266.104 EPA 1991h
	Hazardous Waste Burned in Boilers and Industrial Furnaces Regulation of residues	Yes	40 CFR 266.112 EPA 1985i
	Procedure for Estimating the Toxicity Equivalency of Chlorinated dibenzo-p-dioxin and dibenzofuran congeners	Yes	40 CFR 266, App. IX EPA 1989f
	Land disposal of certain dioxin-containing wastes prohibited (2,3,7,8-TCDD)	Yes	40 CFR 268.31 EPA 1988f
	Land Disposal Restrictions Treatment Standards for hazardous waste—waste code F032	Wastewaters 6.3×10^{-5} mg/L or combustion Nonwastewaters 0.001 mg/L or combustion	62 FR 25998 EPA 1997d
	Land Disposal Restrictions	Yes	40 CFR 268.48 EPA 1991i
	Prohibitions on storage of restricted wastes	Yes	40 CFR 268.50 EPA 1986i
	Land Disposal Restrictions: List of Halogenated Organic Compounds Regulated Under 268.32 (PCDD, TCDD, HxCDD)	Yes	40 CFR 268, App. III EPA 1987m
Guidelines:			
a. Air:			
NIOSH	C _a = Potential Human Carcinogen	Carcinogen; lowest feasible concentrations	NIOSH 1997
b. Water:			
EPA ODW	MCLG in drinking water (2,3,7,8-TCDD)	Zero	EPA 1995a

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
	Health Advisories (2,3,7,8-TCDD):		EPA 1996a
	1-day (child)	1.0x10 ⁻⁶ mg/L (1.0x10 ⁻³ µg/L)	
	10-day (child)	1.0x10 ⁻⁷ mg/L (1.0x10 ⁻⁴ µg/L)	
	Longer term (child)	1.0x10 ⁻⁸ mg/L (1.0x10 ⁻⁵ µg/L)	
	Longer term (adult)	4.0x10 ⁻⁸ mg/L (4.0x10 ⁻⁵ µg/L)	
	10 ⁻⁴ Cancer risk level	2.0x10 ⁻⁸ mg/L (2.0x10 ⁻⁵ µg/L)	
EPA OW	Ambient Water Quality Criteria for Protection of Human Health:		EPA 1984a
	Ingesting water and organisms (2,3,7,8-TCDD):		
	10 ⁻⁵	1.3x10 ⁻⁷ µg/L	
	10 ⁻⁶	1.3x10 ⁻⁸ µg/L	
	10 ⁻⁷	1.3x10 ⁻⁹ µg/L	
	Ingesting organisms only (2,3,7,8-TCDD):		
	10 ⁻⁵	1.4x10 ⁻⁷ µg/L	
	10 ⁻⁶	1.4x10 ⁻⁸ µg/L	
	10 ⁻⁷	1.4x10 ⁻⁹ µg/L	
NAS	ADI (2,3,7,8-TCDD)	10 ⁻⁴ µg/kg/day	NAS 1977
c. Food:			
FDA	Levels in fish (2,3,7,8-TCDD):		EPA 1985d
	No serious health effects	<25 ppt	
	Fish should not be consumed	>50 ppt	
d. Other:			
EPA	RfD (oral)	Not Determined	IRIS 1998
	Carcinogen classification (HxCDD)	B2 ^c	EPA 1996a
	Unit risk (air) (HxCDD)	1.3 µg/m ³	IRIS 1998
	Unit risk (water) (HxCDD)	1.8x10 ⁻¹ (µg/L) ⁻¹	
NTP	Cancer Classification—Reasonably anticipated to be a human carcinogen	Limited evidence in humans; sufficient evidence in animals	NTP 1998
FDA	Risk-specific dose	0.057 pg/kg/day	FDA 1990
DHHS	Risk-specific dose for total TEQs	0.057 pg/kg/day	PHS 1992
<u>STATE</u>			
Regulations and Guidelines:			
a. Air:	Acceptable Ambient Air Concentrations		NATICH 1992
AZ	(1 hour) (2,3,7,8-TCDD)	4.2x10 ⁻² µg/m ³	
	(24 hour) (2,3,7,8-TCDD)	1.1x10 ⁻² µg/m ³	
	(Annual) (2,3,7,8-TCDD)	3.0x10 ⁻⁵ µg/m ³	
FL - Pinella	(Annual) (2,3,7,8-TCDD)	2.2x10 ⁻⁸ µg/m ³	
IN	(Annual) (2,3,7,8-TCDD)	3.0x10 ⁻⁸ µg/m ³	
KS	(1 year) (2,3,7,8-TCDD)	3.03x10 ⁻⁸ µg/m ³	
ME	(24 hour) (2,3,7,8-TCDD)	3.5x10 ⁻⁶ µg/m ³	
	(Annual) (2,3,7,8-TCDD)	2.5x10 ⁻⁷ µg/m ³	

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
STATE (cont.)			
MI	(Annual) (2,3,7,8-TCDD)	$2.3 \times 10^{-8} \mu\text{g}/\text{m}^3$	
NC	(Annual) (2,3,7,8-TCDD)	$3.01 \times 10^{-6} \mu\text{g}/\text{m}^3$	
NC - Forco	(Annual) (2,3,7,8-TCDD)	$8.00 \times 10^{-6} \mu\text{g}/\text{m}^3$	
ND	(2,3,7,8-TCDD) (avg. time NA)	$4.5 \times 10^{-1} \mu\text{g}/\text{m}^3$	
PA - Phil	(1 year) (2,3,7,8-TCDD) (Annual) (2,3,7,8-TCDD)	$1.00 \times 10^{-4} \mu\text{g}/\text{m}^3$ $3.50 \times 10^{-6} \mu\text{g}/\text{m}^3$	
VA	(24 hour) (2,3,7,8-TCDD)	$3.00 \mu\text{g}/\text{m}^3$	
VT	(Annual) (dioxins)	$2.00 \times 10^{-2} \mu\text{g}/\text{m}^3$	
KY	Significant emission levels of toxic air pollutants (2,3,7,8-TCDD)	5.1×10^{-7} pounds/hour	401 KAR 63:022 NREPC 1986
WA - SW	(Annual) (2,3,7,8-TCDD)	$3.0 \times 10^{-8} \mu\text{g}/\text{m}^3$	NATICH 1992
WI	Hazardous air contaminants without acceptable ambient concentrations (2,3,7,8-TCDD)	.0001 pounds/year	WAC 1988
b. Water:			
CA	Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California—Proposed rulex	Yes	62 FR 42160 EPA 1997
FL	Drinking water monitoring for unregulated contaminants (2,3,7,8-TCDD)	Yes	CELDS 1994
KS	Applied action levels for groundwater (2,3,7,8-TCDD)	2 pg/L	KBWP 1988
	Drinking Water Quality Guidelines and Standards (2,3,7,8-TCDD)	$2.2 \times 10^{-6} \mu\text{g}/\text{L}$	FSTRAC 1990
ME	Drinking Water Quality Guidelines and Standards (2,3,7,8-TCDD)	$2.2 \times 10^{-6} \mu\text{g}/\text{L}$	FSTRAC 1990
MO	Surface water criterion (2,3,7,8-TCDD): Aquatic life Drinking water supplies	0.014 pg/L 0.130 pg/L	10 CSR 20-7.031 MDNR 1987
MN	Recommended allowable limits (proposed) (2,3,7,8-2,3,7,8-TCDD)	20 pg/L	MWQS 1988a
	Chronic criteria (proposed) (2,3,7,8-TCDD): Groundwater Surface water	2 pg/L 0.002 pg/L	MWQS 1988b
NH	Drinking Water Guideline	$2 \times 10^{-7} \mu\text{g}/\text{L}$	FSTRAC 1990
NY	Ambient water quality standard aquatic life (2,3,7,8-TCDD) Maximum concentration level in drinking water (2,3,7,8-TCDD) Water quality standard (2,3,7,8-TCDD)	1 pg/L 5 $\mu\text{g}/\text{L}$ 1 pg/L	NYWQSGV 1987; NYPDWS 1989
RI	Drinking Water Guideline	$2 \times 10^{-7} \mu\text{g}/\text{L}$	FSTRAC 1990
SD	Maximum allowable concentrations in ground water (2,3,7,8-TCDD)	0	SDGWQS 1989

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Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

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VT	Groundwater protection regulations (2,3,7,8-TCDD): Preventive action limit Enforcement standard	2×10^{-8} µg/L 2×10^{-7} µg/L	VANR 1988
WI	Human cancer criteria (2,3,7,8-TCDD): Public water supply: Warm water sport fish communities Cold water communities Great Lakes communities Non-water supply: Warm water sport communities Cold water communities Warm water forage and limited forage fish communities and limited aquatic life	0.097 pg/L 0.03 pg/L 0.03 pg/L 0.1 pg/L 0.03 pg/L 450 pg/L	WDNR 1987
<u>Water Quality Criteria: Human Health</u>			
AZ	Domestic Water Source Fish Consumption Fullbody contact	2×10^{-7} µg/L 4×10^{-9} µg/L 9×10^{-6} µg/L	CELDS 1994
CT	Consumption of Organisms Consumption of Water and Organisms Health Designation	1.4×10^{-9} µg/L 1.3×10^{-6} µg/L C-HB ^d	
DE	Freshwater Fish Ingestion Freshwater Fish and Water Ingestion Marine/Estuarine Fish/Shellfish Ingestion Human Health Concern (carcinogen)	1.7×10^{-6} ng/L 1.6×10^{-6} ng/L 2.4×10^{-7} ng/L CA	
IN	Continuous Criterion Concentration (4-d avg.) Outside mixing zone Point of water intake	1×10^{-7} µg/L 1×10^{-7} µg/L	
KY	Fish Consumption Domestic Water Supply	1.4×10^{-9} µg/L 1.3×10^{-9} µg/L	
MO	Fish Consumption Drinking Water Supply Groundwater	1.4×10^{-6} ng/L 1.3×10^{-6} ng/L 1.3×10^{-6} ng/L	
NY	Groundwater	3.5×10^{-6} µg/L	
OH	Outside Mixing Zone (30-d avg.)	0.14 pg/L	
OR	Water and Fish Ingestion Fish Ingestion	1.3×10^{-6} ng/L 1.4×10^{-6} ng/L	
SD	Domestic Water Supply All Others	1.3×10^{-9} µg/L 1.4×10^{-9} µg/L	

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Agency	Description	Information	References
<u>STATE (cont.)</u>			
VT	Class A or B Waters Class C Waters	1.3x10 ⁻⁶ ng/L 1.4x10 ⁻⁶ ng/L	
WI	Public Water Supplies Warm Water Cold Water Great Lakes Non-public Water Supplies Warm Water Sport Cold Water Forage Groundwater Groundwater	0.097 pg/L 0.03 pg/L 0.03 pg/L 0.1 pg/L 0.3 pg/L 450 pg/L 2.2x10 ⁻⁸ µg/L	
<u>Water Quality Criteria: Aquatic Life</u>			
AZ	Acute-Cold Water Fishery Acute-Warm Water Fishery Acute-Effluent Dominated Water Acute-Ephemeral Chronic-Coldwater Fishery Chronic-Warm Water Fishery Chronic-Effluent Dominated Water Chronic-Ephemeral	0.01 µg/L 0.01 µg/L 0.12 µg/L 0.1 µg/L 0.005 µg/L 0.005 µg/L 0.01 µg/L 0.01 µg/L	CELDS 1994
HI	Acute-Freshwater Fish Consumption	0.03 µg/L 5x10 ⁻⁹ µg/L	
OR	Acute-Freshwater Chronic-Freshwater	0.01 µg/L 38 pg/L	
<u>Water Quality Criteria: Recreational Use</u>			
TN		1x10 ⁻⁶ ng/L	
<u>Groundwater Monitoring</u>			
IL		Yes	CELDS 1994
LA		Yes	
MN		Yes	
WV		Yes	
WI		Yes	
<u>Fish and Wildlife Advisories</u>		<u>Number of Advisories Issued for 1997</u>	
		Fish	Wildlife
AR	Freshwater	1	1 (wood duck)
CA	Saltwater	1	
DE	Freshwater	1	
FL	Freshwater	1	
LA	Freshwater	2	
MA	Freshwater	1	
			EPA 1998b

7. REGULATIONS AND ADVISORIES

Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
<u>STATE (cont.)</u>			
ME	Freshwater and saltwater (statewide)	8	EPA 1998a EPA 1998b
MI	Freshwater	8	EPA 1998b
MS	Freshwater	1	
NC	Freshwater and Saltwater	5	
NH	Freshwater	1	
NJ	Freshwater and Saltwater (statewide)	9	EPA 1998a EPA 1998b
NY	Freshwater and Saltwater (statewide)	10	EPA 1998a EPA 1998b
OR	Freshwater	1	EPA 1998b
RI	Freshwater	1	
TN	Freshwater	1	
TX	Saltwater	1	
VA	Freshwater	2	
WA	Freshwater and Saltwater	2	
WI	Freshwater	2	
WV	Freshwater	6	
c. Food:			
WI	Health standards for contaminants commonly found in sport fish (2,3,7,8-TCDD)	50 ppt	WAC 1988
d. Other:			
<u>Hazardous Constituent</u>			
CA	Total Threshold Limit Concentration Toxic Materials Limits (30-d avg.)	1 mg/kg 0.0039 pg/L	CELDS 1994
CO		Yes	
IL		Yes	
KY	Defined as hazardous waste constituent (dioxins)	Yes	401 KAR 31:160 NREPC 1988
	Dioxin-containing wastes are prohibited from land disposal (dioxins)	Yes	401 KAR 37:030 NREPC 1988
	Treatment standards; constituent concentration in waste extract (dioxins)	<1 ppb	401 KAR 37:040 NREPC 1988
LA		Yes	CELDS 1994
MA		Yes	
MN		Yes	
ND		Yes	
WV		Yes	

7. REGULATIONS AND ADVISORIES

Table 7-1. Regulations and Guidelines Applicable to CDDs (continued)

Agency	Description	Information	References
STATE (cont.)			
WI	<u>Groundwater Effluent Standards</u>	Yes	
NY		3.5x10 ⁻⁶ µg/L	CELDS 1994

^a Group 1: carcinogenic to humans

^b Because of its carcinogenic potential the EPA-recommended concentration for dioxins in ambient water is zero. However, because attainment of this level may not be possible, levels that correspond to upper-bound incremental lifetime cancer risks of 10⁻⁵, 10⁻⁶, and 10⁻⁷ are estimated.

^c Group B2: probable human carcinogens

^d C: Carcinogenic (probable or possible); HB: high potential to bioaccumulate or bioconcentrate

ADI = Acceptable Daily Intake; CELDS = Computer-environment legislative data systems database. CDDs = chlorinated dibenzo-p-dioxins; DOT = Department of Transportation; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; FR = Federal Register; HCN = Health Council of the Netherlands; HxCDD = Hexachlorodibenzo-p-dioxin; IARC = International Agency for Research on Cancer; KBWP = Kansas Bureau of Water Protection; MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; MDNT = Missouri Department of Natural Resources; MPRSA = Marine Protection Research and Sanctuaries Act; MWQS = Minnesota Water Quality Standards; NAS = National Academy of Sciences; NATICH = National Air Toxics Information Clearinghouse; NIOSH = National Institute of Occupational Safety and Health; NREPC = National Resources and Environmental Protection Cabinet; NYPDWS = New York Public Drinking Water Standards; NYWQSGV = New York Water Ambient Quality Ambient Standards and Guidance Values; OAR = Office of Air and Radiation; OCDD = octachlorodibenzo-p-dioxin; ODW = Office of Drinking Water; OERR = Office of Emergency and Remedial Response; OPP = Office of Pesticide Programs; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; OPTS = Office of Pesticides and Toxic Substances; OW = Office of Water; Penta-CDD = Pentachlorodibenzo-p-dioxin; RCRA = Resource Conservation and Recovery Act; RfD = Reference Dose; SDGWQS = South Dakota Ground-Water Quality Standards; SDWA = Safe Drinking Water Act; TEQ = TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin; TDI = Tolerable Daily Intake; TSCA = Toxic Substance Control Act; VANR = Vermont Agency of Natural Resources; WAC = Wisconsin Administrative Code; WDNR = Wisconsin Department of Natural Resources; WHO = World Health Organization