7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding mercury and mercury compounds in air, water, and other media are summarized in Table 7-1. Unless otherwise indicated, the listings in the table refer to mercury.

An MRL of 0.0002 mg/m^3 has been derived for chronic-duration inhalation exposure (365 days or more) to metallic mercury vapor in a group of 26 mercury-exposed workers from three industries exposed to low levels of mercury for an average of 15.3 years (range, 1–41 years) (Fawer et al. 1983).

An MRL of 0.007 mg mercury/kg/day has been derived for acute-duration oral exposure (14 days or less) to inorganic mercury based on a NOAEL of 0.93 mg mercury/kg for renal effects (increased absolute and relative kidney weights) in rats exposed to gavage doses of mercuric chloride for 14 days (NTP 1993).

An MRL of 0.002 mg mercury/kg/day has been derived for intermediate-duration (15–364 days) oral exposure to inorganic mercury based on a NOAEL of 0.23 mg mercury/kg for renal effects (increased absolute and relative kidney weights) in rats (Dieter et al. 1992; NTP 1993).

An MRL of 0.0003 mg mercury/kg/day has been derived for chronic-duration (365 days or more) oral exposure to methylmercury, based on neurodevelopmental outcomes in a study by Davidson et al. (1998) of children exposed *in utero* to methylmercury from maternal fish ingestion.

EPA has derived an oral RfD of 8×10^{-5} mg/kg/day (0.08 µg/kg/day) for phenylmercuric acetate as mercury (IRIS 1997). The RfD is based on a LOAEL of 0.5 ppm mercury or 0.042 mg/kg/day phenyl mercuric acetate for detectable kidney damage in female rats after 2 years (Fitzhugh et al. 1950). EPA has derived an oral RfD of 3×10^{-4} mg/kg/day (0.3 µg/kg/day) for mercuric chloride. The RfD is based on LOAELs of 0.226, 0.317, and 0.633 mg/kg/day of mercuric chloride. Although no one study was found adequate for deriving an oral RfD, EPA's mercury workgroup derived an oral RfD of high confidence using the weight of evidence from three studies (Andres 1984; Bernaudin et al.; Druet et al. 1978) which used Brown-Norway rats, and an intensive review and discussion of the entire inorganic mercury data base (IRIS 1997). EPA has derived an oral RfD of 1×10^{-4} mg/kg/day (0.1 µg/kg/day) for methylmercury based on developmental neurological abnormalities in human infants (IRIS 1997). EPA has not derived an RfD value for elemental mercury. The EPA inhalation reference concentration (RfC) for elemental mercury is $3x10^{-4}$ mg/m^3

(0.3 µg/m^3). The RfC is based on a LOAEL of 0.025 ppm for human occupational exposure studies. Critical effects seen during these studies included hand tremors, increases in memory disturbances, and slight subjective and objective evidence of autonomic dysfunction (IRIS 1997). No RfC was reported for other mercury compounds.

The American Conference of Governmental Industrial Hygienists (ACGIH) and the EPA have determined that inorganic forms of mercury, including metallic mercury, are not classifiable as to their human carcinogenicity. These agencies have assigned mercury and its inorganic compounds the weight-of-evidence classifications of A4 and D, respectively (ACGIH 1996; IRIS 1997). Mercuric chloride and methylmercury have been assigned EPA's weight-of evidence classification of C, which indicates that they are possible human carcinogens (IRIS 1997).

OSHA requires employers of workers who could be occupationally exposed to mercury to institute engineering controls and work practices which ensure that during any part of the workday, mercury concentrations do not exceed the ceiling value of 1 mg/10 m^3 (0.1 mg/m^3) (OSHA 1974).

Mercuric cyanide, mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate, mercury, and mercury fulminate have been designated as hazardous substances pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (EPA 1995i). Mercuric acetate, mercuric chloride, and mercuric oxide are mercury compounds that have been individually designated as extremely hazardous substances under Section 313 of Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 (EPA 1995j). Phenylmercury acetate is consider both a hazardous substance and an extremely hazardous substances. The statutory sources designating mercury and regulated mercury compounds as CERCLA hazardous substances are section 307(a) of the Clean Water Act (CWA), section 112 of the Clean Air Act (CAA), and section 3001 of the Resource Conservation and Recovery Act (RCRA) (EPA 1995i). The owner and operator of facilities using these substance on their sites are required to immediately report releases to any environmental media, if the amount released exceeds the established "reportable quantity" (EPA 1995i). The statutory and final reportable quantities for mercury and regulated mercury compounds as established by Section 102 of CERCLA are given in Table 7-1 (EPA 1995i). Although mercury compounds are listed generically as CERCLA hazardous substances no reportable quantity has been established for them as a broad class (EPA 1995i). Title III of SARA is also known as "The Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986." As chemicals subject
to the emergency planning and release reporting requirements of EPCRA, owners and operators of

facilities that have mercuric acetate, mercuric chloride, and mercuric oxide on their sites in amounts exceeding the "threshold planning quantity" established for these substances must develop a program that addresses implementing emergency response plans and for notifying the public of accidental releases (EPA 1987a, 1995j). When extremely hazardous substances are formulated as a solids they are subject to either of two threshold planning quantities (EPA 1995j). If the solid exits in powdered form and has a particle size less than 100 microns, it is subject to the lower number. If the solid does not meet this criteria, it is subject to the higher number. The threshold planning quantities for mercuric acetate, mercuric chloride, mercuric oxide, and phenylmercury acetate are given in Table 7-1. It is important to note that reportable quantities for these compounds are the same as their threshold planning quantities.

The EPA regulates mercury under the Clean Air Act (CAA) and has designated it as a hazardous air pollutant (HAP). Emission standards for release of mercury to the atmosphere have been promulgated for mercury cell chloralkali plants, mercury ore processing facilities, major stationary sources, and municipal waste combustors (EPA 1975a, 1975b, 1995a, 1996b).

In accordance with the authority of the Safe Drinking Water Act (SDWA), EPA has established a safe drinking water standard for mercury at 2 μg/L (FSTRAC 1995). Under the Clean Water Act (CWA) EPA provides criterion concentrations for mercury as a priority toxic pollutant (EPA 1992).

Mercury is regulated as a "priority pollutant" in accordance with the Clean Water Act (CWA). The CWA establishes the basic structure for regulating the discharge of pollutants to waterways and is designed to ensure that all waters are sufficiently clean to protect public health and/or the environment. However, 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.

Advisories have been developed and issued to warn people about the health risks of consuming methylmercury-contaminated fish, shellfish, or wildlife and provide guidance as to the amount of fish or wildlife that can be safely consumed by each group (adults, pregnant women, nursing mothers, and young children). Each state, Native American tribe, or U.S. Territory establishes its own criteria for issuing fish and wildlife advisories. A fish or wildlife advisory will specify which waters (lake, rivers, estuaries, or coastal areas) or hunting areas have restrictions. The advisory provides information on the species and size range of the fish or wildlife of concern. The advisory may completely ban eating fish, shellfish, or

freshwater turtles, or it may recommend consumption limits (numbers of fish meals per specified time period) considered to be safe to eat. For example, an advisory may recommend that a person eat a certain type of fish no more than once a month. Advisories may specify the tissues of the fish or wildlife that can be safely eaten or proper preparation and cooking practices to help decrease exposure to methylmercury. The fish or wildlife advisory is typically more restrictive to protect pregnant women, nursing mothers, and young children. To reduce children's exposure to methylmercury, state advisory recommendations for fish consumption limits (meals per week or meals per month) should be strictly observed. Published information in the form of brochures on fish and wildlife advisories is available from State Public Health Departments, Natural Resources Departments, or Fish and Game Departments. Signs may be posted in certain fishing and hunting areas frequently used by recreational fishers and hunters to warn them about specific contamination problems (EPA 1995 Fish Sampling analysis and Guidance Document).

Currently, 1,782 advisories are in effect in 41 states and one U.S. Territory (American Samoa) restricting the consumption of mercury-contaminated fish, shellfish, or wildlife (freshwater turtles) (EPA 1998a). Methylmercury is the chemical pollutant responsible, in part, for over 77% of fish advisories issued in the United States (EPA 1998b). Eleven states (Connecticut, Indiana, Maine, Massachusetts, Michigan, Missouri, New Hampshire, New Jersey, North Carolina, Ohio, and Vermont) currently have state-wide mercury advisories recommending that all residents restrict consumption of locally caught freshwater fish. In addition, 5 states (Alabama, Florida, Louisiana, Massachusetts, and Texas) have issued statewide coastal mercury advisories for specific marine fish or shellfish species. In two states (Arizona and Minnesota), wildlife advisories have been issued recommending that residents restrict their consumption of freshwater turtles (EPA 1998a, 1998b).

The FDA currently has advice for consumers (posted on the Internet) recommending that pregnant women, and women of childbearing age who may become pregnant, limit their consumption of shark and swordfish to no more that one meal per month (FDA 1998). Methylmercury levels are much higher in these fish species than in the more commonly consumed species. The FDA advisory covers women of childbearing age who might become pregnant because dietary practices immediately before the pregnancy may have a direct bearing on fetal exposure during pregnancy. The FDA states that nursing mothers who follow this advice, will not expose their infants to increased health risks from methylmercury (FDA 1998). The FDA consumer advice hotline telephone number is **1-800-332-4010** and the FDA Web site is **www.FDA.gov**.

7. REGULATIONS AND ADVISORIES

The Food and Drug Administration (FDA) regulates the use of mercury compounds in the cosmetics industry. The FDA regulations on the use of mercury compounds in cosmetics state that "because of the known hazards of mercury, its questionable efficacy as a skin-bleaching agent, and the availability of effective and less toxic non-mercurial preservatives, there is no justification for the use of mercury in skin-bleaching preparations or its use as a preservative in cosmetics, with the exception of eye-area cosmetics" (FDA 1974). The use of mercury compounds as cosmetic ingredients has primarily been limited to their use as preservatives in eye area cosmetics for which no other effective and safe non-mercurial preservative is available. In other preparations they must contain no more than trace amounts of mercury that are unavoidable under the conditions of good manufacturing practices (FDA 1974). The mercurial concentration in these other preparations must measure less than 1 ppm or 0.0001% mercury metal (FDA 1974).

The FDA has also established an action level of 1 ppm for methylmercury in fish (FDA 1994, 1996). Because of reports that swordfish, shark and other large predatory fish may contain methylmercury levels which exceed the FDA 1 ppm limit, the agency’s advice to consumers warns pregnant women and women of childbearing age to limit their consumption of shark and swordfish to no more than one meal a month (FDA 1996). For others, the agency recommends that regular consumption of fish species with methylmercury levels around 1 ppm be limited to approximately 7 ounces per week; for fish with levels averaging 0.5 ppm, the limit is about 14 ounces per week (FDA 1996). The consumption advice is considered unnecessary for the top 10 species of fish that make up approximately 80% of the seafood market (FDA 1996). Canned tuna, shrimp, pollock, salmon, cod, catfish, clams, flatfish, crabs, and scallops are the top 10 species of fish consumed (FDA 1996). Since methylmercury levels in these species are usually less than 0.2 ppm and because few people eat more than the suggested weekly limit of 2.2 pounds (1 kilogram) for this contamination level, consumption limits are considered unnecessary (FDA 1996).

On May 28, 1998, the Consumer Product Safety Commission (CPSC) issued a guidance statement recommending that manufacturers of liquid-filled consumer products eliminate the use of hazardous chemicals in the liquid portion of their products (CPSC 1998). The guidance statement was issued as an effort to reduce the risk of exposing young children to hazardous chemicals contained in the liquid. The hazardous chemicals found in the liquid include mercury, ethylene glycol, diethylene glycol, methanol, methylene chloride, petroleum distillates, toluene, and xylene. Children’s products identified by the Commission as containing these hazardous chemicals include rolling balls, maze toys, bubble watches, and necklaces. Paperweights, keychains, liquid timers, and pens were household items identified as containing

mercury or other hazardous chemicals (CPSC 1998). In addition to the recommendation that manufacturers eliminate the use of hazardous chemicals in these products, the Commission also recommends that importers, distributors, and retailers who purchase a liquid-filled product for resale, obtain from the manufacturer assurances that their product does not contain hazardous liquid chemicals. Although the guidance is not a rule, it focuses on certain obligations authorized by the Federal Hazardous Substance Act (FHSA). Under the FHSA toys or other articles that contain an accessible and harmful amount of hazardous chemical and are intended for use by children are banned (CPSC 1998). Articles that are not intended for use by children, but create a risk of injury because they contain hazardous chemicals, require precautionary labeling under the FHSA (CPSC 1998).

In 1995, the CPSC assisted in facilitating the recall of necklaces bearing small vials or glass balls containing metal mercury (CPSC 1995). Although the vials and glass balls posed no immediate health threat, the recall noted that exposure to mercury vapor could cause long term health problems, especially for small children and pregnant women, if the vials or balls were broken (CPSC 1995).

Table 7-1. Regulations and Guidelines Applicable to Mercury

Agency	Description	Information	References
INTERNATIONAL			
Guidelines:			
WHO	Drinking-water guideline values for health-related organics (applies to all forms of mercury)	0.001 mg/L	WHO 1984
	Permissible tolerable weekly intake	5 µg/kg total 3.3 µg/kg CH_3Hg	WHO 1976
NATIONAL			
Regulations: a. Air:			
OSHA	Air Contaminants permissible exposure limit (PEL) 8-hr. time weighted average (TWA)	0.1 mg/m^3	29 CFR 1910.1000 OSHA 1974[a]
EPA/OAR	Hazardous Air Pollutants	Yes	CAA Amendment Title III, Section 112 (b) U.S. Congress 1990
	Prevention of Significant Deterioration of Air Quality–pollutant emissions rate defined as significant	0.1 tons per year	40 CFR 51.166 EPA 1996h
	pollutant emission rate-exemption of major stationary source	< 0.25 µg/m^3 (24-hour average)	
	Standards of Performance for New Stationary Sources–emissions limits for municipal waste combustors	0.080 mg/m^3 or 15% of the potential mercury emission concentration corrected to 7% oxygen	40 CFR 60, Subpart Cb EPA 1995a
	standards of performance for municipal waste combustors	Yes	40 CFR 60, Subpart Eb EPA 1995b
	National Emission Standards for Hazardous Air Pollutants (NESHAPs)–list of pollutants and applicability	Yes	40 CFR 61.01 EPA 1971a
	standard for mercury ore processing facilities and mercury cell chlor-alkali plants (mercury)	< 2300 g per 24-hour period	40 CFR 61, Subpart E EPA 1975c
	standard for sludge incineration plants, sludge drying plants, or a combination of these that process wastewater treatment plant sludges (mercury)	< 3200 g per 24-hour period	

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

Agency	Description	Information	References
NATIONAL (cont.)			
	National Emission Standards for Hazardous Air Pollutants for Source Categories-Regulations Governing Extension for Early Reductions of Hazardous Air Pollutants–list of high-risk pollutants	Yes	40 CFR 63, Subpart D EPA 1994a
b. Water			
EPA-ODW	National Primary Drinking Water Regulations		
	Maximum Contaminant Level (MCL) for inorganic compounds	0.002 mg/L	40 CFR 141, Subpart F EPA 1992b
	BAT for inorganic compounds	coagulation/ filtration[e,f], granular activated charcoal, lime softening[e,f], reverse osmosis[e]	
	Hazardous Waste Injection Restrictions–waste specific prohibitions; California list wastes	Yes	40 CFR 148.12 EPA 1988
EPA-OW	Designation of Hazardous Substances- List of hazardous substances, Table 116.4 (mercuric cyanide, mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate)	Yes	40 CFR 116.4 EPA 1978a
	Determination of Reportable Quantities for Hazardous Substances-RQ Pursuant to Section 311 CWA–mercuric cyanide	1 pound (0.45 kg)	40 CFR 117.3 EPA 1995c
	mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate	10 pounds (4.54 kg)	
	EPA Permit Programs: National Pollution Discharge Elimination System (NPDES)–other toxic pollutant (metals and cyanide) and total phenols	Yes	40 CFR 122, App. D EPA 1983
	Criteria and Standards for the NPDES-Instructions for Form 2C, Application for Permit to Discharge Wastewater (mercuric cyanide, mercuric nitrate, mercuric sulfate, mercuric thiocyanate, mercurous nitrate)	Yes	40 CFR 125 EPA 1984a

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

Agency	Description	Information		References
NATIONAL (cont.)				
	Toxics Criteria for those States Not Complying with CWA Section 303(c)(2)(B)-criterion concentration for priority toxic pollutants	Maximum[b] (µg/L)	Continous[c] (µg/L)	40 CFR 131.36 EPA 1992a
	freshwater	2.10	0.012[d]	
	saltwater	1.80	0.025	
	human health consumption of:			
	water and organisms	0.14[e]		
	organisms only	0.15[e]		
	Water Quality Guidance for the Great Lakes Systems-protection of aquatic life in ambient water	Maximum[b] (µg/L)	Continous[c] (µg/L)	40 CFR 132 EPA 1995d
	acute water quality criteria for mercury (II) total recoverable	1.694 µg/L	NA	
	chronic water quality criteria for mercury (II) total recoverable	NA	0.908 µg/L	
	water quality criteria for protection of human health (HNV for mercury including methylmercury) drinking water and non-drinking water	1.8×10^{-3} µg/L		
	water quality criteria for protection of human health (mercury including methylmercury)	1.3×10^{-3} µg/L		
	pollutants that are bioaccumulative chemicals of concern	mercury		
	Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites–maximum concentration of constituents for groundwater (mercury)	0.002 µg/L		40 CFR 192.04 EPA 1995e
	Criteria for the Evaluation of Permit Applications for Ocean Dumping of Materials–constituents prohibited as other than trace contaminants	Yes		40 CFR 227.6 EPA 1978b
c. Food:				
FDA	Action Level for Poisonous or Deleterious Substances in Human Food and Animal Feed			FDA 1994 and FDA 1998
	fish, shellfish, crustaceans, other aquatic animals (fresh, frozen or processed)	1 ppm		
	wheat-pink kernels only; an average of 10 or more pink kernels per 500 grams	1 ppm		
	Bottled water	0.002 µg/L		21 CFR 165.110 FDA 1995

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

Agency	Description	Information	References
NATIONAL (cont.)			
d. Other:			
EPA-OERR	List of Hazardous Substances and Reportable Quantities (RQ)	Statutory / Final (pounds)	40 CFR 302.4 EPA 1995i
	mercury	1 / 1	
	mercuric cyanide	1 / 1	
	mercuric nitrate	10 / 10	
	mercuric sulfate	10 / 10	
	mercuric thiocyanate	10 / 10	
	mercurous nitrate	10 / 10	
	mercury fulminate	1 / 10	
	phenylmercury acetate	1 / 100	
EPA-OSW	Criteria for Classification of solid Waste Disposal Facilities and Practices	Yes	40 CFR 257, App I EPA 1991a
	Criteria for Municipal Solid Waste Landfills–MCLs	0.002 µg/L	40 CFR 258.40 and App. II
	list of hazardous constituent	Yes	EPA 1991b
	Identification and Listing of Hazardous Waste–definition of a Hazardous Waste	Yes	40 CFR 261.3 EPA 1992c
	generic exclusion levels for K061 and K062 wastes for nonwastewater HTMR residues	0.009 mg/L (maximum for single composite sample-TCLP)	
	toxicity characteristic–maximum concentration	0.2 mg/L	40 CFR 261.24 EPA 1993a
	hazardous waste from specific sources	K071 K106	40 CFR 261.32 EPA 1992d
	discarded commercial chemical products, off-specification, container residues, and spills	Yes	40 CFR 261.33 EPA 1994b
	mercury	U151	
	mercury fulminate	P065	
	phenylmercuric acetate	P092	
	basis for listing hazardous wastes	K071 K106	40 CFR 261, App. VII EPA 1995g
	hazardous constituents-		40 CFR 261, App. VIII
	mercury	U151	EPA 1994c
	mercury fulminate	P065	
	phenylmercury acetate	P092	
	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities–Releases from Solid Waste Management Units	Yes	40 CFR 264.94 EPA 1995f
	concentration limits for groundwater protection	0.002 µg/L	
	ground-water monitoring list	yes	40 CFR 264, App. IX EPA 1995h

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

Agency	Description	Information		References
NATIONAL (cont.)				
	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities–thermal treatment, incinerators, and land treatment	Yes		40 CFR 265 EPA 1991c
	Standards for Management of Specific Hazardous Wastes Facilities–hazardous waste burned in boilers and industrial furnaces	Yes		40 CFR 266.100 EPA 1991d
	reference air concentration	0.3 µg/m^3		40 CFR 266 App. IV EPA 1991d
	health-based limits for exclusion of waste-derived residues	$2x10^{-1}$		40 CFR 266 App. VII EPA 1993b
	mercury bearing waste that may be processed in exempt mercury recover units	Yes		40 CFR 266 App. XIII EPA 1994d
	methods Manual for Compliance with BIF Regulations	Yes		40 CFR 266, App. IX EPA 1991e
	Land Disposal Restrictions– treatment Standards	WW (technology code or mg/L TCLP)	NWW	40 CFR 268.40 EPA 1997d
	D009	0.20	IMERC, RMERC, AMLGM, 0.20	
	F039	0.15	0.025	
	K001	NA	0.025	
	K071	NA	0.20	
	K084	0.15	0.25 or 0.25	
	K101	0.15	NA	
	K102	0.15	NA	
	K106 (≥260 mg/kg total mercury)	0.15	RMERC, 0.20, 0.025	
	P065 (mercury fulminate)	0.15	IMERC, RMERC, 0.2, 0.025	
	P092 (phenylmercuric acetate)	0.15	IMERC, RMERC, 0.20, 0.025	
	U151	0.15	RMERC, AMLGM, 0.20, 0.025	
	Treatment Standards Expressed as Specified Technologies	AMLGM, IMERC, and RMERC,		40 CFR 268.42 EPA 1994e

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

Agency	Description	Information	References
NATIONAL (cont.)			
	Treatment Standards for Hazardous Debris	Yes	40 CFR 268.45 EPA 1992e
	Emergency Planning and Notification-Extremely Hazardous Substances and Their Threshold Planning Quantities		40 CFR 355, App. A EPA 1995j
	mercuric acetate	500/10,000 pounds	
	mercuric chloride	500/10,000 pounds	
	mercuric oxide	500/10,000 pounds	
	phenylmercury acetate	500/10,000 pounds	
	Emergency Planning and Notification-Extremely Hazardous Substances and Their Reportable Quantities		
	mercuric acetate	500 pounds	
	mercuric chloride	500 pounds	
	mercuric oxide	500 pounds	
	phenylmercury acetate	100 pounds	
	Toxic Chemical Release Reporting: Community Right-to-Know--Specific Chemical Listing-Chemicals and Chemical Categories	Yes	40 CFR 372.65 EPA 1987a
FDA	Cosmetics-use of mercury compounds	Yes	21 CFR 700.13 FDA 1974
	eye area cosmetics (mercury calculated as the metal)	< 65 ppm	
NRC	Standards for Protection Against Radiation	Yes	10 CFR 20 DOE 1993
	Rules of General Applicability to Domestic Licensing of Byproduct Material	Yes	10 CFR 30 DOE 1994a
	Domestic Licensing of Source Material	Yes	10 CFR 40 DOE 1994b
	Packaging and Transport of Radioactive Material	Yes	10 CFR 71 DOE 1996a
	Export and Import of Nuclear Equipment and Material	Yes	10 CFR 110 DOE 1996b
Guidelines a: Air:			
ACGIH	STEL/Ceiling-alkyl compounds	0.3 mg/m^3	ACGIH 1996
	TWA-alkyl compounds	0.01 mg/m^3	
	aryl compounds	0.1 mg/m^3	
	inorganic forms including metallic mercury	0.025 mg/m^3	
NIOSH	Recommended Exposure Limit for Occupation Exposure (8-hr TWA)-aryl or inorganic mercury as mercury	0.1 mg/m^3 ceiling (skin)	NIOSH 1992
	mercury (organo) alkyl compounds as mercury	0.01 mg/m^3 TWA 0.03 mg/m^3 STEL (skin)	
	mercury vapor as mercury	0.05 mg/m^3 TWA	

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

Agency	Description	Information	References
NATIONAL (cont.)			
b. Water:			
EPA-ODW	National Primary Drinking Water Regulations–MCLGs for inorganic compounds	0.002 mg/L	40 CFR 141, Subpart F EPA 1992b
	Lifetime Health Advisory (adult)-inorganic mercury (final)	0.002 mg/L	EPA 1996g
	Longer-term Health Advisory (adult)-inorganic mercury (final)	0.002 mg/L	
	Drinking Water Equivalent Level	0.002 mg/L	
	Ambient Water Quality Criteria for Human Health–mercury and phenylmercuric acetate		IRIS 1997 IRIS 1997
	water and fish	1.44×10^{-1} µg/L	
	fish only	1.46×10^{-1} µg/L	
	Ambient Water Quality Criteria for Aquatic Organisms–mercury and phenylmercuric acetate as mercury	Marine Freshwater (µg/L)	IRIS 1997 IRIS 1997
	acute(1- hour average)	2.1 2.4	
	chronic (4-day average)	2.5×10^{-2} 1.2×10^{-2}	
c. Food			
FDA	Consumption of shark or swordfish by pregnant or childbearing age women	No more than one meal a month	FDA 1998
	Regular consumption of fish species with methylmercury levels around 1 ppm	7 ounces per week	
	Fish with levels averaging 0.5 ppm	14 ounces per week	
d. Other:			
ACGIH	Cancer Ranking-metallic mercury	A4[g]	ACGIH 1996
EPA	Cancer Classification		IRIS 1997
	elemental (metallic) mercury	D[h]	
	methyl mercury	C[i]	
	mercuric chloride	C[i]	
CPSC	Notice of Availability of Guidance Document on Hazardous Liquid Chemicals in Children's Products	Yes	63 FR 29182 CPSC 1998
EPA	RfC (elemental mercury)	3×10^{-4} mg/m^3 (0.3 µg/m^3)	IRIS 1997
	RfD (mercuric chloride)	3×10^{-4} mg/kg/day (0.3 µg/kg/day)	
	RfD (methyl mercury)	1×10^{-4} mg/kg/day (0.1 µg/kg/day)	
	RfD (phenylmercuric acetate)	8×10^{-5} mg/kg/day (0.08 µg/kg/day)	

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

Agency	Description	Information	References
STATE			
Regulations and Guidelines:			
a. Air:	Average Acceptable Ambient Air Concentrations-Mercury		NATICH 1992
AZ	1 hour	1.5 $\mu g/m^3$	
	24 hours	$4.0x10^{-1}$ $\mu g/m^3$	
(phenylmercuric acetate)	1 hour	$2.5x10^{-1}$ $\mu g/m^3$	
	24 hours	$7.9x10^{-2}$ $\mu g/m^3$	
CT	8 hours	1.0 $\mu g/m^3$	
	8 hours	2.0 $\mu g/m^3$	
FL-FtLdle	8 hours	$5.0x10^{-4}$ mg/m^3	
FL-Pinella	8 hours	$1.0x10^{-1}$ $\mu g/m^3$	
	24 hours	$2.4x10^{-2}$ $\mu g/m^3$	
(phenylmercuric acetate)	Annual	$7.5x10^{-1}$ $\mu g/m^3$	
FL-Tampa	8 hours	$5.0x10^{-4}$ mg/m^3	
IN	8 hours	$5.0x10^{-2}$ $\mu g/m^3$	
KS	Annual	$2.4x10^{-2}$ $\mu g/m^3$	
LA	8 hours	1.19 $\mu g/m^3$	
MT	24 hours	$8.0x10^{-2}$ $\mu g/m^3$	
	Annual	$1.0x10^{-2}$ $\mu g/m^3$	
NC	15 minutes	$6.0x10^{-4}$ mg/m^3	
NC-Forco	24 hours	$6.0x10^{-4}$ mg/m^3	
ND	8 hours	$5.0x10^{-4}$ mg/m^3	
NV	Not Indicated	$2.0x10^{-3}$ mg/m^3	
NY	1 year	$1.67x10^{-1}$ $\mu g/m^3$	
OK	24 hours	$5.0x10^{-1}$ $\mu g/m^3$	
(phenylmercuric acetate)	24 hours	$5.0x10^{-1}$ $\mu g/m^3$	
PA-Phil	1 year	$2.4x10^{-1}$ $\mu g/m^3$	
	Annual	$2.4x10^{-1}$ $\mu g/m^3$	
SC	24 hours	$2.5x10^{-1}$ $\mu g/m^3$	
TX	30 minutes	$5.0x10^{-1}$ $\mu g/m^3$	
	Annual	$5.0x10^{-2}$ $\mu g/m^3$	
VA	24 hours	$1.7x10^{4}$ $\mu g/m^3$	
	24 hours	$8.3x10^{1}$ $\mu g/m^3$	
	24 hours	1.7 $\mu g/m^3$	
VT	Annual	$1.2x10^{-1}$ $\mu g/m^3$	
WA-SWEST	Annual	$3.0x10^{-1}$ $\mu g/m^3$	
b. Water	Water Quality Criteria: Human Health		FSTRAC 1995
AL	Drinking water (standard)	2 µg/L	
AZ	Drinking water (standard)	2 µg/L	

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

Agency	Description	Information		References
STATE (cont.)				
ME	Drinking water (guideline)	2 µg/L		
MN	Drinking water (guideline)	2 µg/L		
c. Other				
	Fish and Wildlife Consumption Advisories	Number of Advisories Issued for 1997		EPA 1998a
		Fish	Wildlife	
AL[j]	Freshwater; Marine (statewide)	4		EPA 1998a EPA 1998b
AS	Marine	1		EPA 1998a
AZ	Freshwater	2	3 (turtles)	
AR	Freshwater	19		
CA	Freshwater; Estuarine	11		
CO	Freshwater	8		
CT[k]	Freshwater (statewide)	5		EPA 1998a EPA 1998b
FL[j]	Freshwater;Estuarine;Marine (statewide)	96		
GA	Freshwater; Estuarine	23		EPA 1998a
ID[k]	Freshwater	1		EPA 1998a EPA 1998b
IL	Freshwater	2		EPA 1998a
IN	Freshwater (statewide)	109		EPA 1998a EPA 1998b
KY	Freshwater	1		EPA 1998a
LA[j]	Freshwater; Marine (statewide)	15		
MA[j,k]	Freshwater (statewide); Marine (statewide)	55		
ME[k]	Freshwater (statewide)	1		
MI[k]	Freshwater (statewide)	41		
MN	Freshwater	755	6 (turtles)	EPA 1998a
MO[k]	Freshwater (statewide)	1		EPA 1998a EPA 1998b
MS	Freshwater	7		EPA 1998a
MT	Freshwater	22		
NC[k]	Freshwater (statewide)	10		EPA 1998a EPA 1998b
ND	Freshwater	36		EPA 1998a
NE	Freshwater	12		
NH[k]	Freshwater (statewide)	2		EPA 1998a EPA 1998b
NJ[k]	Freshwater (statewide)	30		
NM	Freshwater	26		EPA 1998a
NY	Freshwater	15		
NV	Freshwater	2		EPA 1998a

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

Agency	Description	Information	References
STATE (cont.)			
OH[k]	Freshwater (statewide)	19	EPA 1998a EPA 1998b
OK	Freshwater	1	EPA 1998a
OR	Freshwater	9	
PA	Freshwater	1	
RI	Freshwater	1	
SC	Freshwater	24	
TN	Freshwater	2	
TX[j]	Freshwater; Estuarine; Marine (statewide)	7	EPA 1998a EPA 1998b
VT[k]	Freshwater (statewide)	3	
VA	Freshwater	3	EPA 1998a
WA	Estuarine	1	
WI	Freshwater	390	

[a] A U.S. Court of Appeals rescinded the 1989 PELs promulgated by OSHA. Only PELs in place prior to the 1989 rule are currently allowed (58 FR 35338, June 30, 1993).
[b] Criteria maximum concentration (CMC) is the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (l-hour average) without deleterious effects and is not to be exceeded more than once every three years.
[c] Criteria continuous concentration (CCC) is the highest concentration of a pollutant to which aquatic life can be exposed for a short period of time (4 days) without deleterious effects and is not to be exceeded more than once every three years.
[d] If the CCC for total mercury exceeds 0.012 µg/L more than once in a 3-year period in the ambient water, the edible portion of aquatic species of concern must be analyzed to determine whether the concentration of methyl mercury exceeds the FDA action level of 1.0 mg/kg.
[e] BAT only if influent mercury concentration is less than 10 µg/L.
[f] BAT for systems with less than 500 service connections.
[g] A4 means that the substance in not classifiable as a human carcinogen. There are inadequate data on which to classify the substance for humans and/or animals.
[h] Cancer classification D means that the substance is not classifiable as to its carcinogenicity. There is inadequate or no human and animal evidence of carcinogenicity.
[i] Cancer classification C means that the substance is a possible human carcinogen.
[j] States issuing coastal for mercury in specific marine fish and shellfish species.
[k] State issuing state-wide advisories for mercury recommending that all residents restrict consumption of locally-caught freshwater fish.

AMLGM = Amalgamation of Liquid, Elemental Mercury Contaminated with Radioactive Materials; BAT = Best Available Technology; BIF = Boilers and Industrial Furnaces; CAA = Clean Air Act; CWA = Clean Water Act; CPSC = Consumer Product Safety Commission; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; FSTRAC = Federal State Toxicology and Regulatory Alliance committee; HAP = Hazardous Air Pollutants; HNV = Human Noncancer Value; HTMR = High Temperature Metals Recovery; IARC = International Agency for Research on Cancer; IMERC = Incineration of Wastes containing Organics and Mercury;MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; NAS = National Academy of Sciences; NESHAP= National Emission Standards for Hazardous Air Pollutants; NIOSH = National Institute of Occupational Safety and Health; NPDES = National Pollution Discharge Elimination System; NRC = Nuclear Regulatory Commission; NWW = Nonwastewaters; OAR - Office of Air and Radiation; ODW = Office of Drinking Water; OERR = Office of Emergency and Remedial Response; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; OTS = Office of Toxic Substances; PEL = Permissible Exposure Limit; RfD = Reference Dose; RMERC = Retorting or Roasting of Mercury RQ = Reportable Quantities; SOCMI = Synthetic Organic Chemicals Manufacturing Industry; STEL = Short-term exposure Limit; TCLP = Toxicity Characteristic Leaching Procedure; TLV= Threshold Limit Value; TWA = Time-weighted Average; WHO = World Health Organization; WW = Wastewaters