

## 7. REGULATIONS AND ADVISORIES

Barium is on the list of chemicals appearing in "Toxic Chemicals Subject to Section 313 of the Emergency Planning and Right-to-Know Act of 1986" (EPA 1987b).

No international regulations pertaining to barium and its compounds were found. The national and state regulations and guidelines regarding barium in air, water, and other media are summarized in Table 7-1.

## 7. REGULATIONS AND ADVISORIES

TABLE 7-1. Regulations and Guidelines Applicable to Barium

Agency	Description	Information	References
<u>NATIONAL</u>			
Regulations:			
a. Air:			
OSHA	PEL TWA (8-hr. final rule) Barium (soluble compounds) Barium sulfate (total dust) (respirable fraction)	0.5 mg/m <sup>3</sup> 10 mg/m <sup>3</sup> 5 mg/m <sup>3</sup>	OSHA 1989
b. Water:			
EPA ODW	MCL (proposed) for barium in drinking water MCL (present) for barium in drinking water  AADI <sup>a</sup>	5 mg/L 1 mg/L  1.8 mg/L	EPA 1989a EPA 1975b (40 CFR 141.11) EPA 1985b
FDA	Bottled water; quality standard	1.0 mg/L	FDA 1977 (21 CFR 103.35)
d. Other:			
EPA OERR	CERCLA reportable quantity Barium cyanide	10 lb (4.54 kg)	EPA 1986a (40 CFR 117.3)
EPA OSW	Designation of hazardous substances Barium cyanide Listings as toxic waste: Maximum concentration of contaminants for characteristic of EP toxicity (barium) Listing as acute hazardous waste: Discarded commercial chemical products off-specifications species container residues, and spill residues thereof Barium cyanide Listing as hazardous waste constituents Barium and compounds; barium cyanide Groundwater monitoring list (total barium)	Yes 100.0 mg/L   Yes Yes Yes	EPA 1978 (40 CFR 116.4) EPA 1980a (40 CFR 261.24) EPA 1980b (40 CFR 261.33) EPA 1988b (40 CFR 261, Appendix VIII) EPA 1987a (40 CFR 264, Appendix IX)
EPA OTS	Maximum concentration for groundwater protection (barium) Toxic chemical release reporting; community right-to-know (proposed) Barium	1.0 mg/L Yes	EPA 1982 (40 CFR 264.94) EPA 1987b
OSHA	Meets the criteria for the proposed OSHA medical records rule	Yes Yes	OSHA 1982
Guidelines:			
a. Air:			
ACGIH	TLV TWA Barium Barium sulfate (total dust) Short-term excursions to 3x above TLV for no more than 30 min during an 8-hr workday	0.5 mg/m <sup>3</sup> 10 mg/m <sup>3</sup>	ACGIH 1986 ACGIH 1988
EPA	Inhalation AIC for barium Inhalation AIS for barium	0.01 mg/day 0.098 mg/day	EPA 1984 EPA 1984
NIOSH	IDLH	250 mg/m <sup>3</sup>	NIOSH 1985
b. Water:			
EPA ODW	BAT for IOC (barium)	Ion exchange; lime softening; reverse osmosis	EPA 1989a

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TABLE 7-1 (Continued)

Agency	Description	Information	References
<u>NATIONAL</u> (cont.)			
EPA ODW	MCLG (proposed) for barium	5 mg/L	EPA 1989a
	Health advisories:		EPA 1987d
	1-Day (modified DWEL for 10-kg child)	0.51 mg/L	
	10-Day (modified DWEL for 10-kg child)	0.51 mg/L	
	Longer-term		
	Modified DWEL for 10-kg child	0.51 mg/L	
	Modified DWEL for 70-kg adult	1.8 mg/L	
	Lifetime	1.5 mg/L	
NAS	SNARL		NAS 1982
	24-Hour	6.0 mg/L	
	Chronic	4.7 mg/L	
c. Other:			
EPA	RfD (oral)		
	Barium	$7 \times 10^{-2}$ mg/kg/day	IRIS 1991
<u>STATE</u>			
Regulations and Guidelines:			
a. Air:	Acceptable ambient air concentrations		NATICH 1988
Connecticut	(8-hr)	10.0000 $\mu\text{g}/\text{m}^3$	
Florida			
(Tampa)	(8-hr)	0.0050 $\text{mg}/\text{m}^3$	
Nevada	(8-hr)	0.0120 $\text{mg}/\text{m}^3$	
New York	(1-yr)	0.6700 $\mu\text{g}/\text{m}^3$	
North Dakota	(8-hr)	0.0050 $\text{mg}/\text{m}^3$	
Virginia	(24-hr)	8.0000 $\mu\text{g}/\text{m}^3$	
b. Water:	Drinking water quality standards and guidelines in drinking waters		FSTRAC 1988
Massachusetts		100 $\mu\text{g}/\text{L}$	
Maine		1000 $\mu\text{g}/\text{L}$	
Minnesota		1500 $\mu\text{g}/\text{L}$	
	Maximum contaminant levels (MCLs) for barium		CELDs 1989
Alabama	Limits:		
	Drinking water standards	1.0 mg/L	
	Maximum concentration for EP toxicity	100 mg/l	
	Groundwater	1 mg/L	
Alaska	Public water supply	1.0 mg/L	
Arizona	Limits:		
	Community water systems	1.0 mg/L	
	Non-community water systems	2.0 mg/L	
	Protected use of surface water	1.0 mg/L	
California	Community water systems	1.0 mg/L	
Colorado	Limits:		
	Community water systems	1.0 mg/L	
	Groundwater	1.0 mg/L	
Connecticut	Drinking water	1.0 mg/L	
Delaware	Drinking water	1.0 mg/L	
District of Columbia	Surface and groundwater for public water supply	1.0 mg/L	

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TABLE 7-1 (Continued)

Agency	Description	Information	References
<u>STATE</u> (cont.)			
Florida	Surface and potable waters	1.0 mg/L	
Florida	Maximum contaminant level for community and non-community water systems	1.0 mg/L	
Georgia	Community water systems	1.0 mg/L	
Hawaii	Drinking water from surface sources	1.0 mg/L	
Idaho	Limits:		
	Drinking water	1.0 mg/L	
	Domestic water supplies	1.0 mg/L	
Illinois	Public and food processing use from underground water supply	1.0 mg/L	
Illinois	General water quality secondary contact and indigenous aquatic life	5.0 mg/L	
Illinois	Effluent (sewer and treatment)	2.0 mg/L	
Illinois	Finished water	1.0 mg/L	
Indiana	Limits:		
	Lake Michigan and contiguous harbors	1000 µg/L	
	Drinking water	1.0 mg/L	
	All state waters	1.0 mg/L	
Indiana	Hazardous and solid waste facilities groundwater protection	1.0 mg/L	
Iowa	Surface waters, class B and C water wildlife, aquatic and potable	1.0 mg/L	
Iowa	Public water systems	1.0 mg/L	
Kansas	Drinking water	1.0 mg/L	
Kentucky	Limits:		
	Community water systems	1.0 mg/L	
	Surface water	1.0 mg/L	
Kentucky	Hazardous and solid waste facilities groundwater protection	1.0 mg/L	
Maine	Drinking water	1.0 mg/L	
Maryland	Drinking water supply	1.0 mg/L	
Massachusetts	Groundwater (class I and II)	1.0 mg/L	
	Groundwater discharge/effluent	1.0 mg/L	
Minnesota	Drinking water (class A, B, and D)	1.0 mg/L	
Minnesota	Community water systems	1.0 mg/L	
Mississippi	Drinking water	1.0 mg/L	
Missouri	Drinking water supply	1.0 mg/L	
Missouri	Effluent limitations for subsurface water	1.0 mg/L	
Missouri	Aquifer recharge that has an effect on aquatic life	1000 µg/L	
Montana	Public water supply	1.0 mg/L	
Nebraska	Community water systems	1.0 mg/L	
Nebraska	Groundwater	1.0 mg/L	
Nebraska	Maximum concentration of EP toxicity at hazardous waste sites	100 mg/L	
Nebraska	Public drinking water	1.0 mg/L	

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TABLE 7-1 (Continued)

Agency	Description	Information	References
<u>STATE</u> (cont.)			
Nevada	Limits:		
	Aquatic life	<5.0 mg/L	
	Recreation, wildlife	<1.0 mg/L	
New Hampshire	Public water systems	1.0 mg/L	
New Jersey	Surface waters	1.0 mg/L	
New Mexico	Community water systems	1.0 mg/L	
New Mexico	Groundwater - human	1.0 mg/L	
New York	Groundwater (class GA for drinking) allowable level	1.0 mg/L	
New York	Community water supplies	1.0 mg/L	
New York	Effluent	2.0 mg/L	
North Carolina	Drinking and food processing class WS-I and WS-II	1.0 mg/L	
North Carolina	Community water systems	1.0 mg/L	
North Carolina	Drinking water (class GA)	1.0 mg/L	
	Potable mineral water (class GSA)	1.0 mg/L	
North Carolina	Maximum concentration for EP toxicity	100 mg/L	
	Maximum concentration for groundwater protection	1.0 mg/L	
North Dakota	Class i, ii, and iii waters	1.0 mg/L	
North Dakota	Drinking water	1.0 mg/L	
Ohio	Lake Erie, public, agricultural, industrial, and bathing water supplies	1.0 mg/L	
Ohio	Ohio River, water quality standards (permissible concentration)	1.0 mg/L	
Ohio	Drinking water	1.0 mg/L	
Ohio	Ohio River Valley for domestic and industrial uses	1.0 mg/L	
Ohio	Surface waters	1.0 mg/L	
Oklahoma	Raw water	1.0 mg/L	
Oklahoma	Public water supply	1.0 mg/L	
Oklahoma	Effluent concentrations	5.0 mg/L	
Oregon	Maximum contaminant level	1.0 mg/L	
Puerto Rico	Limits:		
	Coastal waters	1000 µg/L	
	Surface waters	1000 µg/L	
	Potable water	1.0 mg/L	
Rhode Island	Drinking water	1.0 mg/L	
South Dakota	Community water systems (MCL)	1.0 mg/l	
South Dakota	Domestic water supply	1.0 mg/L	
Tennessee	Community water systems; maximum containment level	1.0 mg/L	
Tennessee	Effluent, municipal and domestic wastewater treatment	5.0 mg/L	
Tennessee	Maximum concentration For EP toxicity at hazardous waste sites	100 mg/L	
	Maximum groundwater concentration	1.0 mg/L	

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TABLE 7-1 (Continued)

Agency	Description	Information	References
<u>STATE (cont.)</u>			
Texas	Community water systems	1.0 mg/L	
Texas	Discharge to inland and tidal waters	avg=1.0 mg/L composite= 2.0 mg/l	
Utah	Raw water for domestic water system	1.0 mg/L	
Utah	Drinking water	1.0 mg/L	
Vermont	Drinking water	1.0 mg/L	
Virginia	Limits:		
	Drinking or domestic use	1.0 mg/L	
	Groundwater	1.0 mg/L	
	Surfacewater	1.0 mg/L	
Washington	Public water supply	1.0 mg/L	
West Virginia	Public water supply	1.0 mg/L	
Wisconsin	Effluent discharge from potassium iodide plant	ave: 0.003 lbs/1000lbs max: 0.009 lbs/1000lbs	
Wisconsin	Community water systems	1.0 mg/L	
Wyoming	Groundwater	1.0 mg/L	
	Fish and aquatic life	5.0 mg/L	

\*Assumes consumption of 2 liters of water per day

AADI = Acceptable Average Daily Intake; ACGIH = American Conference of Governmental Industrial Hygienists; AIC = Acceptable Intake Chronic; AIS = Acceptable Intake Subchronic; BAT = Best Available Technology; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DWEL = Drinking Water Equivalent Level; EP = Extraction Procedure; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; IDLH = Immediately Dangerous to Life or Health Level; IOC = Inorganic Chemical; IRIS = Integrated Risk Information System; MCL = Maximum Contaminant Level; MCLG = Maximum Contaminant Level Goal; NAS = National Academy of Sciences; NIOSH = National Institute for Occupational Safety and Health; 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; SNARL = Suggested No-Adverse-Response Level; TLV = Threshold Limit Value; TWA = Time-Weighted Average