

## CHAPTER 7. REGULATIONS AND GUIDELINES

Pertinent international and national regulations, advisories, and guidelines regarding thallium in air, water, and other media are summarized in Table 7-1. This table is not an exhaustive list, and current regulations should be verified by the appropriate regulatory agency.

ATSDR develops MRLs, which are substance-specific guidelines intended to serve as screening levels by ATSDR health assessors and other responders to identify contaminants and potential health effects that may be of concern at hazardous waste sites. No MRLs were derived for thallium; see Appendix A for detailed information.

**Table 7-1. Regulations and Guidelines Applicable to Thallium**

Agency	Description	Information	Reference
<b>Air</b>			
EPA	RfC Thallium(I) soluble salts	Value(s) not derived	<a href="#">IRIS 2009</a>
WHO	Air quality guidelines	Not listed	<a href="#">WHO 2010</a>
<b>Water &amp; Food</b>			
EPA	Drinking water standards and health advisories Thallium 1-Day health advisory (10-kg child) 10-Day health advisory (10-kg child)	0.007 mg/L 0.007 mg/L	<a href="#">EPA 2018a</a>
	National primary drinking water regulations Thallium MCL MCLG	0.002 mg/L 0.0005 mg/L	<a href="#">EPA 2009b</a>
	RfD Thallium(I) soluble salts	Value(s) not derived	<a href="#">IRIS 2009</a>
	Provisional peer reviewed toxicity values Thallium and compounds	Provisional screening values only	<a href="#">EPA 2012</a>
WHO	Drinking water quality guidelines	Not listed	<a href="#">WHO 2022</a>
FDA	Substances added to food (formerly EAFUS) <sup>a</sup> Allowable level in bottled water	Not listed 0.002 mg/L	<a href="#">FDA 2023b</a> <a href="#">FDA 2023a</a>
<b>Cancer</b>			
HHS	Carcinogenicity classification	Not evaluated	<a href="#">NTP 2021</a>
EPA	Carcinogenicity classification	Inadequate information to assess carcinogenic potential	<a href="#">IRIS 2009</a>

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Agency	Description	Information	Reference
IARC	Carcinogenicity classification	Not evaluated	<a href="#">IARC 2023</a>
<b>Occupational</b>			
OSHA	PEL (8-hour TWA) for general industry, shipyards, and construction Thallium, soluble compounds (as Tl)	0.1 mg/m <sup>3</sup> <sup>a</sup>	OSHA <a href="#">2021a</a> , <a href="#">2021b</a> , <a href="#">2021c</a>
NIOSH	REL (up to 10-hour TWA) Thallium, soluble compounds (as Tl)	0.1 mg/m <sup>3</sup> <sup>a</sup>	<a href="#">NIOSH 2019</a>
<b>Emergency Criteria</b>			
NIOSH	IDLH Thallium, soluble compounds (as Tl)	15 mg/m <sup>3</sup>	<a href="#">NIOSH 1994</a>
EPA	AEGLs-air	Not listed	<a href="#">EPA 2018b</a>
DOE	PACs-air		<a href="#">DOE 2018a</a>
	Thallium		
	PAC-1 <sup>b</sup>	0.06 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	3.3 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	20 mg/m <sup>3</sup>	
	Thallium chloride		
	PAC-1 <sup>b</sup>	0.18 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	23 mg/m <sup>3</sup>	
	Thallium hydroxide		
	PAC-1 <sup>b</sup>	0.065 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	3.7 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	22 mg/m <sup>3</sup>	
	Thallium nitrite		
	PAC-1 <sup>b</sup>	0.074 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	4.2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	25 mg/m <sup>3</sup>	
	Thallium oxide		
	PAC-1 <sup>b</sup>	0.062 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	3.5 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	21 mg/m <sup>3</sup>	
	Thallium sulfate		
	PAC-1 <sup>b</sup>	0.18 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	21 mg/m <sup>3</sup>	
	Thallium(I) acetate		
	PAC-1 <sup>b</sup>	0.077 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	4.3 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	26 mg/m <sup>3</sup>	

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Agency	Description	Information	Reference
	Thallium(I) carbonate (2:1)		
	PAC-1 <sup>b</sup>	0.18mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	23 mg/m <sup>3</sup>	
	Thallium(I) sulfate		
	PAC-1 <sup>b</sup>	0.18 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	25 mg/m <sup>3</sup>	
	Thallium(III) oxide		
	PAC-1 <sup>b</sup>	0.18 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	2 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	8.7 mg/m <sup>3</sup>	
	Thallos nitrate		
	PAC-1 <sup>b</sup>	0.078 mg/m <sup>3</sup>	
	PAC-2 <sup>b</sup>	4.3 mg/m <sup>3</sup>	
	PAC-3 <sup>b</sup>	26 mg/m <sup>3</sup>	

<sup>a</sup>Skin notation

<sup>b</sup>Definitions of PAC terminology are available from DOE (2018b).

AEGL = acute exposure guideline levels; DOE = Department of Energy; EAFUS = Everything Added to Food in the United States; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; HHS = Department of Health and Human Services; IARC = International Agency for Research on Cancer; IDLH = immediately dangerous to life or health; IRIS = Integrated Risk Information System; MCL = maximum contaminant level; MCLG = maximum contaminant level goal; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PAC = protective action criteria; PEL = permissible exposure limit; REL = recommended exposure limit; RfC = inhalation reference concentration; RfD = oral reference dose; TWA = time-weighted average; WHO = World Health Organization