

## CHAPTER 7. REGULATIONS AND GUIDELINES

Pertinent international and national regulations, advisories, and guidelines regarding DDT, DDE, and DDD 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. See Section 1.3 and Appendix A for detailed information on the MRLs for DDT, DDE, and DDD.

**Table 7-1. Regulations and Guidelines Applicable to DDT, DDE, and DDD**

Agency	Description	Information	Reference
<b>Air</b>			
EPA	RfC	No data	IRIS <a href="#">2002a</a> , <a href="#">2002b</a> , <a href="#">2003</a>
WHO	Air quality guidelines	No data	<a href="#">WHO 2010</a>
<b>Water &amp; Food</b>			
EPA	Drinking water standards and health advisories	Not listed	<a href="#">EPA 2018a</a>
	National primary drinking water regulations	Not listed	<a href="#">EPA 2009</a>
	RfD		<a href="#">IRIS 2002a</a>
	<i>p,p'</i> -DDT	5x10 <sup>-4</sup> mg/kg/day	
	Provisional peer reviewed toxicity value		
	<i>p,p'</i> -DDE		<a href="#">EPA 2017c</a>
	Provisional subchronic RfD	3x10 <sup>-4</sup> mg/kg/day	
	<i>p,p'</i> -DDD		<a href="#">EPA 2017b</a>
	Screening provisional subchronic RfD	3x10 <sup>-5</sup> mg/kg/day	
	Screening provisional chronic RfD	3x10 <sup>-5</sup> mg/kg/day	
WHO	Drinking water quality guidelines for DDT and metabolites		<a href="#">WHO 2017</a>
	Guideline value	0.001 mg/L (1 µg/L)	
	Provisional tolerable daily intake	0.01 mg/kg-body weight	
FDA	Substances added to food <sup>a</sup>	Not listed	<a href="#">FDA 2021</a>

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Agency	Description	Information	Reference
<b>Cancer</b>			
HHS	Carcinogenicity classification DDT	Reasonably anticipated to be a human carcinogen	<a href="#">NTP 2016</a>
EPA	Carcinogenicity classification <i>p,p'</i> -DDT, <i>p,p'</i> -DDE, <i>p,p'</i> -DDD Oral slope factor <i>p,p'</i> -DDT <i>p,p'</i> -DDE <i>p,p'</i> -DDD Inhalation unit risk <i>p,p'</i> -DDT	Group B2 <sup>b</sup>  3.4x10 <sup>-1</sup> per mg/kg/day 3.4x10 <sup>-1</sup> per mg/kg/day 2.4x10 <sup>-1</sup> per mg/kg/day  9.7x10 <sup>-5</sup> per µg/m <sup>3 c</sup>	<a href="#">IRIS 2002a</a> , <a href="#">2002b</a> , <a href="#">2003</a>  <a href="#">IRIS 2002a</a> <a href="#">IRIS 2003</a> <a href="#">IRIS 2002b</a>  <a href="#">IRIS 2002a</a>
IARC	Carcinogenicity classification DDT	Group 2A <sup>d</sup>	<a href="#">IARC 2018</a>
<b>Occupational</b>			
OSHA	PEL (8-hour TWA) for general industry, shipyards, and construction DDT	1 mg/m <sup>3 e</sup>	<a href="#">OSHA 2020a</a> , <a href="#">2020b</a> , <a href="#">2020c</a>
NIOSH	REL (up to 10-hour TWA) DDT IDLH DDT	0.5 mg/m <sup>3 f</sup>  500 mg/m <sup>3 f</sup>	<a href="#">NIOSH 2016</a>  <a href="#">NIOSH 2014</a>
<b>Emergency Criteria</b>			
EPA	AEGLs-air	No data	<a href="#">EPA 2018a</a>
DOE	PACs-air DDT PAC-1 <sup>g</sup> PAC-2 <sup>g</sup> PAC-3 <sup>g</sup> DDE PAC-1 <sup>g</sup> PAC-2 <sup>g</sup> PAC-3 <sup>g</sup>	  3 mg/m <sup>3</sup> 34 mg/m <sup>3</sup> 210 mg/m <sup>3</sup>  6.5 mg/m <sup>3</sup> 72 mg/m <sup>3</sup> 170 mg/m <sup>3</sup>	<a href="#">DOE 2018b</a>

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Agency	Description	Information	Reference
	DDD		
	PAC-1 <sup>g</sup>	2.4 mg/m <sup>3</sup>	
	PAC-2 <sup>g</sup>	26 mg/m <sup>3</sup>	
	PAC-3 <sup>g</sup>	160 mg/m <sup>3</sup>	

<sup>a</sup>The Substances Added to Food inventory replaces EAFUS and contains the following types of ingredients: food and color additives listed in FDA regulations, flavoring substances evaluated by FEMA or JECFA, GRAS substances listed in FDA regulations, substances approved for specific uses in food prior to September 6, 1958, substances that are listed in FDA regulations as prohibited from use in food, delisted color additives, and some substances "no longer FEMA GRAS."

<sup>b</sup>Group B2: probable human carcinogen.

<sup>c</sup>The unit risk should not be used if the air concentration exceeds  $1 \times 10^2 \mu\text{g}/\text{m}^3$ , since above this concentration the unit risk may not be appropriate.

<sup>d</sup>Group 2A: probably carcinogenic to humans.

<sup>e</sup>Skin designation.

<sup>f</sup>Potential occupational carcinogen.

<sup>g</sup>Definitions of PAC terminology are available from U.S. Department of Energy (DOE 2018a).

AEGL = acute exposure guideline levels; DDD = dichlorodiphenyldichloroethane; DDE = dichlorodiphenyldichloroethylene; DDT = dichlorodiphenyltrichloroethane; DOE = Department of Energy; EAFUS = Everything Added to Food in the United States; EPA = Environmental Protection Agency; FDA = Food and Drug Administration; FEMA = Flavor and Extract Manufacturers Association of the United States; GRAS = generally recognized as safe; 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; JECFA = Joint FAO/WHO Expert Committee on Food Additives; 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