

8. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding aldrin and dieldrin in air, water, and other media are summarized in Table 8-1.

ATSDR has developed two MRL values for aldrin. An acute-duration oral MRL of 2×10^{-3} mg/kg/day was derived for aldrin based on its ability to cause decreased body weight and neurological changes (increased electroconvulsive shock threshold) in offspring of mice exposed during gestation (Al-Hachim 1971). A chronic-duration oral MRL of 3×10^{-5} mg/kg/day was derived for aldrin based on liver effects in rats (hepatocellular enlargement, cytoplasmic eosinophilia, and peripheral migration of basophilic granules along with less prominent alterations of cytoplasmic vacuolation and bile duct proliferation) (Fitzhugh et al. 1964). ATSDR has also derived two MRL values for dieldrin. An intermediate-duration oral MRL of 1×10^{-4} mg/kg/day was derived for dieldrin based on impaired learning of a successive discrimination reversal task in monkeys (Smith et al. 1976). A chronic-duration oral MRL of 5×10^{-5} mg/kg/day was derived for dieldrin based on liver parenchymal cell changes in rats (Walker et al. 1969).

EPA (IRIS 2002a, 2002b) has derived oral reference doses (RfDs) for aldrin and dieldrin of 3×10^{-5} and 5×10^{-5} mg/kg/day, respectively, based on liver toxicity in rats (Fitzhugh et al. 1964; Walker et al. 1969). No inhalation MRLs or reference concentrations (RfCs) have been derived for aldrin or dieldrin.

Aldrin and dieldrin are on the list of chemicals appearing in "Toxic Chemicals Subject to Section 313 of the Emergency Planning and Community Right-to-Know Act of 1986" (EPA 1999c).

All uses of aldrin and dieldrin were canceled in 1974, except for subsurface ground insertion for termite control, dipping of nonfood roots and tops, and moth-proofing by manufacturing processes in a closed system (EPA 1974a). In 1987, these final three uses were voluntarily canceled by the sole manufacturer (EPA 1989a).

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin

Agency	Description	Information	Reference	
<u>INTERNATIONAL</u>				
Guidelines:				
IARC	Carcinogenicity classification Aldrin and dieldrin	Group 3 ^a	IARC 2001	
<u>NATIONAL</u>				
Regulations and Guidelines:				
a. Air				
ACGIH	TWA Aldrin and dieldrin ^b	0.25 mg/m ³	ACGIH 2001	
NIOSH	TWA-REL Aldrin and dieldrin	0.25 mg/m ³	NIOSH 2001	
	IDLH Aldrin	0.25 mg/m ³		
	Dieldrin	0.50 mg/m ³		
OSHA	8-hour TWA Aldrin and dieldrin ^b	0.25 mg/m ³	OSHA 2001b 29CFR1910.1000	
	8-hour TWA for construction industry Aldrin and dieldrin ^b	0.25 mg/m ³	OSHA 2001c 29CFR1926.55	
	8-hour TWA for shipyard industry Aldrin and dieldrin ^b	0.25 mg/m ³	OSHA 2001a 29CFR1915.1000	
b. Water				
EPA	Drinking water standards and health advisories		EPA 2000	
	Aldrin			
	10-kg child			
	1-day and 10-day DWEL ^c	3x10 ⁻⁴ mg/L 1x10 ⁻³ mg/L		
	Dieldrin			
	10-kg child			
1-day and 10-day DWEL ^c	5x10 ⁻⁴ mg/L 2x10 ⁻³ mg/L			
Groundwater monitoring Aldrin and dieldrin		<u>Method</u>	EPA 2001d 40CFR264 Appendix IX	
		8080		<u>PQL (µg/L)</u> 0.05
		8270		10

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin (continued)

Agency	Description	Information	Reference
<u>NATIONAL</u> (cont.)			
EPA	Land disposal restrictions— universal treatment standards		EPA 2001g 40CFR268.48
	Aldrin		
	Wastewater standard	0.021 mg/L ²	
	Non-wastewater standard	0.066 mg/kg ²	
	Dieldrin		
	Wastewater standard	0.017 mg/L ²	
	Non-wastewater standard	0.130 mg/kg ²	
	National recommended water quality criteria		EPA 1999h
	Aldrin		
	Freshwater	3.0 µg/L	
	Saltwater	1.3 µg/L	
	Human health consumption		
	Water and organism	1.3x10 ⁻⁴ µg/L	
	Organism only	1.4x10 ⁻⁴ µg/L	
	Dieldrin		
Freshwater	0.24 µg/L		
Saltwater	0.71 µg/L		
Human health consumption			
Water and organism	1.4x10 ⁻⁴ µg/L		
Organism only	1.4x10 ⁻⁴ µg/L		
Reportable quantity of hazardous substance designated pursuant to Section 311 of the Clean Water Act—aldrin and dieldrin	1 pound	EPA 2001b 40CFR117.3	
Requirement to monitor unregulated contaminant—aldrin and dieldrin		EPA 1999i 64 FR 1495	
Toxic pollutant effluent standards—ambient water criterion for aldrin/dieldrin in navigable waters	0.003 µg/L	EPA 2001l 40CFR129.100	
Water programs—designation of hazardous substance in accordance with Section 311(b)(2)(A) of the Act		EPA 2001m 40CFR116.4	

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin (continued)

Agency	Description	Information	Reference
<u>NATIONAL</u> (cont.)			
c. Food			
USDA	Labeling of seed treated with aldrin (technical) and dieldrin	"This seed has been treated with poison"	USDA 2001 7CFR201.31a
d. Other			
ACGIH	Carcinogenicity classification Aldrin Dieldrin	A3 ^d A4 ^e	ACGIH 2001
EPA	Aldrin Carcinogenicity classification Oral slope factor Drinking water unit risk Inhalation unit risk RfC RfD	B2 ^f 1.7×10^1 (mg/kg/day) ⁻¹ 4.9×10^{-4} (µg/L) ⁻¹ 4.9×10^{-3} (µg/m ³) ⁻¹ Not available 3×10^{-5} mg/kg/day	IRIS 2001a
	Dieldrin Carcinogenicity classification Oral slope factor Drinking water unit risk Inhalation unit risk RfC RfD	B2 ^f 1.6×10^1 (mg/kg/day) ⁻¹ 4.6×10^{-4} (µg/L) ⁻¹ 4.6×10^{-3} (µg/m ³) ⁻¹ Not available 5×10^{-5} mg/kg/day	IRIS 2001b
	Effluent guidelines and standards; toxic pollutant designated pursuant to Section 307(a)(1) of the Act—aldrin and dieldrin		EPA 2001c 40CFR401.15
	Health-based limits for exclusion of waste-derived residues—residue concentration limits Aldrin and dieldrin	2×10^{-5} mg/kg	EPA 2001e 40CFR266 Appendix VII
	Identification and listing as a hazardous waste and identified as an acute hazardous waste Aldrin Dieldrin	P004 P037	EPA 2001f 40CFR261.33(e)
	Pesticide classification for aldrin and dieldrin	Chlorinated organic pesticide	EPA 2001j 40CFR180.3(e)(4)

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin (continued)

Agency	Description	Information	Reference	
<u>NATIONAL</u> (cont.)				
EPA	Reportable quantity designated as a CERCLA hazardous substance under Section 311(b)(4) and 307(a) of the Clean Water Act and RCRA Section 3001—aldrin and dieldrin	1 pound	EPA 2001a 40CFR302.4	
	Risk specific doses		EPA 2001h 40CFR266 Appendix V	
	Aldrin	2.0×10^{-3} ug/m ³		
	Dieldrin	2.2×10^{-3} ug/m ³		
	Superfund, extremely hazardous substance and threshold planning quantity—aldrin	500/10,000 pounds	EPA 2001i 40CFR355 Appendix A	
	Toxic chemical release reporting; Community right-to-know—effective date		EPA 2001k 40CFR372.65	
	Aldrin	01/01/87		
<u>STATE</u> Regulations and Guidelines:				
a. Air				
Washington	Toxic air pollutant and acceptable source impact levels (annual average at 10 ⁻⁶ risk)		BNA 2001	
		Aldrin		2.0×10^{-4} µg/m ³
	Dieldrin	2.2×10^{-4} µg/m ³		
Wisconsin	Hazardous air contaminants acceptable ambient concentrations		WI Department of Natural Resources 1997	
		Aldrin and dieldrin		
		<25 feet emission point		0.020880 pounds/hour
	§25 feet emission point	0.086400 pounds/hour		
b. Water				
Arizona	Drinking water guideline		HSDB 2001a,b	
		Aldrin		0.002 µg/L
	Dieldrin	0.001 µg/L		
California	Drinking water guideline Aldrin and dieldrin	0.05 µg/L	HSDB 2001a,b	

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin (continued)

Agency	Description	Information	Reference
<i>STATE (cont.)</i>			
Florida	Drinking water guideline Aldrin Dieldrin	0.05 µg/L 0.1 µg/L	HSDB 2001a,b
Hawaii	Unregulated contaminant	Monitoring is required	HI Department of Health 1999a
Hawaii	Water quality standards Aldrin Freshwater Acute Chronic Saltwater Acute Chronic Fish Consumption Dieldrin Freshwater Acute Chronic Saltwater Acute Chronic Fish Consumption	 3.0 µg/L No standard 1.3 µg/L No standard 2.6x10 ⁻⁵ µg/L 2.5 µg/L 1.9x10 ⁻³ µg/L 0.71 µg/L 1.9x10 ⁻³ µg/L 2.5x10 ⁻⁵ µg/L	BNA 2001
Illinois	Primary drinking water standard Aldrin and dieldrin	1 µg/L	BNA 2001
Kansas	Water quality standards Aldrin Aquatic life Acute Chronic Agriculture Livestock Public health Food procurement Dieldrin Aquatic life Acute Chronic Agriculture Livestock Public health Food procurement	 3 µg/L 1x10 ⁻³ µg/L 1 µg/L 7.9x10 ⁻⁵ µg/L 1.0 µg/L 1.9x10 ⁻³ µg/L 1.0 µg/L 7.6x10 ⁻⁵ µg/L	BNA 2001

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Table 8-1. Regulations and Guidelines Applicable to Aldrin/Dieldrin (continued)

Agency	Description	Information	Reference
STATE (cont.)			
Maine	Drinking water guideline Dieldrin	0.02 µg/L	HSDB 2001b
New Hampshire	Drinking water guideline Aldrin and dieldrin	0.002 µg/L	HSDB 2001a,b
New Jersey	Ground water quality criteria Aldrin and dieldrin	0.002 µg/L	BNA 2001
South Dakota	Unregulated chemicals—aldrin and dieldrin	Required monitoring by all community and non- transient non- community water systems	BNA 2001

^aGroup 3: not classifiable as to its carcinogenicity to humans

^bSkin notation: danger of cutaneous absorption

^cDWEL: A lifetime exposure concentration protective of adverse, non-cancer health effects, that assumes all of the exposure to a contaminant is from a drinking water source.

^dA3: confirmed animal carcinogen with unknown relevance to humans

^eA4: not classifiable as a human carcinogen

^fB2: Probable human carcinogen

ACGIH = American Conference of Governmental Industrial Hygienists; BNA = Bureau of National Affairs; CERCLA = Comprehensive Environmental Response Compensation and Liability Act; CFR = Code of Federal Regulations; DWEL = drinking water equivalent level; EPA = Environmental Protection Agency; FR = Federal Register; HSDB = Hazardous Substances Data Bank; IARC = International Agency for Research on Cancer; IDLH = immediately dangerous to life or health; IRIS = Integrated Risk Information System; NIOSH = National Institute for Occupational Safety and Health; OSHA = Occupational Safety and Health Administration; PQL = practical quantitation limits; RCRA = Resource Conservation Recovery Act; REL = recommended exposure limit; RfC = inhalation reference concentration; RfD = oral reference dose; TWA = time-weighted average; USDA = U.S. Department of Agriculture

