

7. REGULATIONS AND ADVISORIES

The international, national, and state regulations and guidelines regarding 2,4-DNT and 2,6-DNT in air, water, and other media are summarized in Table 7-1.

ATSDR has derived two MRL values for 2,4-DNT and one MRL value for 2,6-DNT. An acute-duration oral MRL of 0.05 mg/kg/day was derived for 2,4-DNT based on neurotoxicity in dogs (Ellis et al. 1985; Lee et al. 1978). A chronic-duration oral MRL of 0.002 mg/kg/day was derived for 2,4-DNT based on a NOAEL of 0.2 mg/kg/day for neurotoxicity, Heinz bodies, and biliary tract hyperplasia in dogs (Ellis et al. 1979, 1985). For 2,6-DNT, an intermediate-duration oral MRL of 0.004 mg/kg/day was derived based on hematological effects of splenic extramedullary erythropoiesis and lymphoid depletion in dogs (Lee et al. 1976).

The International Agency for Research on Cancer (IARC) classifies 2,4-DNT and 2,6-DNT as Group 2B carcinogens (possibly carcinogenic to humans) (IARC 1996). The U.S. EPA assigns Class 2B (human carcinogen) (EPA 1996).

2,4-DNT and 2,6-DNT are on the list of chemicals in “The Emergency Planning and Community Right-to-Know Act of 1986” (EPA 1989a, 1988a). Section 313 of Title III of the Super-fund Amendments and Reauthorization Act (SARA) requires owners and operators of certain facilities that manufacture, import, process, or otherwise use the chemicals on this list to report annually any release of those chemicals to any environmental media over a specified threshold level.

OSHA requires employers of workers who are occupationally exposed to 2,4-DNT and 2,6-DNT to institute engineering controls and work practices to reduce and maintain employee exposure at or below permissible exposure limits (PEL). If the employer can document that 2,4-DNT and 2,6-DNT are used in the workplace less than 30 days per year, the employer can use any combination of engineering controls, work practice controls, or respirators to reduce employee exposure to or below the (PEL) of 1.5 mg/m³. PELs are 8-hour time-weighted averages (TWA). Respirators must be provided and used during the time period necessary to install or implement feasible engineering and work practice controls, or where controls are not yet sufficient. Respirators are also required when the employer determines that compliance with the PEL is not feasible with engineering or work practice controls, such as maintenance and repair activities, vessel cleaning, or other operations where exposures are intermittent and limited in duration, and in emergencies (OSHA 1987).

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Table 7-1. Regulations and Guidelines Applicable to 2,4-DNT and 2,6-DNT

Agency	Description	Information	References
<u>INTERNATIONAL</u>			
IARC	Carcinogenic classification	Group 2B	IARC 1996
<u>NATIONAL</u>			
Regulations:			
a. Air:			
EPA	NAAQS	None listed	EPA 1995
OSHA	Permissible Exposure Limit–Time-Weighted Average	1.5 mg/m ³ (skin)	OSHA 1998 (29 CFR 1910.1000)
b. Non-specific media:			
EPA	Designated as a hazardous substance	Yes	EPA 1998b (40 CFR 116.4)
	CERCLA Reportable Quantity (2,4- and 2,6-DNT)	1,000 pounds	EPA 1998c (40 CFR 302.4)
	RCRA Reportable Quantity		EPA 1998c (40 CFR 302.4)
	2,4-DNT (U105)	10	
	2,6-DNT (U106)	100	
	OSW Hazardous Waste Constituent	Yes	EPA 1998e (40 CFR 261 Appendix VIII)
	Ground Monitoring List	Yes	EPA 1998e (40 CFR 261 Appendix IX)
Guidelines:			
a. Air:			
EPA	RfC (inhalation)	None listed	IRIS 1998
ACGIH	Threshold Limit Values (TWA)	0.2 mg/m ³ (skin)	ACGIH 1998
NIOSH	Recommended Exposure Limit for Occupational Exposure–TWA	1.5 mg/m ³ (skin)	NIOSH 1997
	Potential Occupational Carcinogen	Yes	NIOSH 1997
b. Water:			
EPA	Ambient Water Quality Criteria to Protect Human Health (2,4-DNT)		IRIS 1996
	Water and fish consumption	0.11 µg/L	
	Fish consumption	9.1 µg/L	
	Drinking Water Advisory Values	EPA 1998d	
	2,4-DNT–10-kg Child		
	1-Day	0.5 mg/L	
	10-Day	0.5 mg/L	
	Longer term	0.3 mg/L	

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**Table 7-1. Regulations and Guidelines Applicable to 2,4-DNT and 2,6-DNT
(continued)**

Agency	Description	Information	References
<u>NATIONAL</u> (cont'd)			
	2,4-Dinitrotoluene—Adult		
	Longer term	1.0 mg/L	
	RfD	0.002 mg/kg/day	
	DWEL	0.1 mg/L	
	Lifetime	None listed	
	2,6-Dinitrotoluene—Child		
	1-Day	0.4 mg/L	
	10-Day	0.4 mg/L	
	Longer term	0.4 mg/L	
	2,6-Dinitrotoluene—Adult		
	Longer term	1.0 mg/L	
	RfD	0.001 mg/kg/day	
	DWEL	0.04 mg/L	
	Lifetime	None listed	
c. Non-specified Media:			
ACGIH	Biological Exposure Index Group (cancer ranking)	None listed A2*	ACGIH 1998 ACGIH 1998
EPA	RfD (oral)		
	2,4-Dinitrotoluene	0.002 mg/kg/day	IRIS 1998
EPA	Carcinogenic Classification		EPA 1996c
	2,4-Dinitrotoluene	B2 ^b	
	2,6-Dinitrotoluene	B2 ^b	
	q ₁ * 2,4-dinitrotoluene (oral)	0.68 (mg/kg/day) ⁻¹	EPA 1992
<u>STATE</u>			
Regulations and Guidelines:			
a. Air:			
	Threshold Ambient Limits and Significant Emission Levels (2,4- or 2,6-DNT if not specified)		
Kentucky	(8-hour)	3.827x10 ⁻⁴ lb/hr	KY NREPC 1998
South Carolina	(24-hour)	1.50 µg/m ³	SC DHEC 1998
Vermont	(annual)	0.011 µg/m ³	VT NRA 1998
Connecticut (2,4-DNT)	(8-hour)	15 µg/m ³	NATICH 1994
Florida (2,4-DNT)	(8-hour)	15 µg/m ³	NATICH 1994
	(24-hour)	3.6 µg/m ³	
	(annual)	0.011 µg/m ³	

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**Table 7-1. Regulations and Guidelines Applicable to 2,4-DNT and 2,6-DNT
(continued)**

Agency	Description	Information	References
STATE (cont'd)			
Louisiana (2,4-DNT)	(8-hour)	35.7 $\mu\text{g}/\text{m}^3$	NATICH 1994
(2,6-DNT)	(8-hour)	35.7 $\mu\text{g}/\text{m}^3$	
Nevada (2,4-DNT)	(8-hour)	36 $\mu\text{g}/\text{m}^3$	NATICH 1994
North Dakota	(8-hour)	15 $\mu\text{g}/\text{m}^3$	ND DHCL 1998
Oklahoma (2,4-DNT)	(8-hour)	15 $\mu\text{g}/\text{m}^3$	NATICH 1994

^aGroup A2: suspected human carcinogen

^bGroup B2: probable human carcinogen, based on animal data

ACGIH = American Conference of Governmental Industrial Hygienists; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DWEL = drinking water equivalency level; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; NAAQS = National Ambient Air Quality Standards; NIOSH = National Institute for Occupational Safety and Health; OSHA = Occupational Safety and Health Administration; OSW = Office of Solid Wastes; RCRA = Resource Conservation Recovery Act; RfC = Reference Concentration; RFD = Reference Dose; TWA = Time-Weighted Average

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2,4-DNT and 2,6-DNT are regulated by the Clean Water Effluent Guidelines in 40 CFR Part 401. For each point source category, 2,4-DNT and 2,6-DNT may be regulated as part of a group of chemicals controlled as total toxic organics, or may have a specific regulatory limitation. The point source categories for which 2,4-DNT and 2,6-DNT are controlled as total toxic organics include electroplating and metal finishing (EPA 1998f). The point source category for which 2,4-DNT and 2,6-DNT have a specific regulatory limitation is organic chemicals, plastics, and synthetic fibers (EPA 1998g).

EPA has developed oral reference dose (RfD) of 0.002 mg/kg/day and 0.001 mg/kg/day for 2,4- and 2,6-DNT, respectively (EPA 1998d).

An oral slope factor (q_1^*) of $6.8 \times 10^{-1} \text{ (mg/kg/day)}^{-1}$ has been derived for the 2,4-/2,6-DNT mixture and is used for the cancer risk assessment of both 2,4- and 2,6-DNT (EPA 1998).

