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OVERSEAS ENVIRONMENTAL BASELINE GUIDANCE DOCUMENT

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FOREWORD

This Department of Defense Publication is issued under the authority and requirements of DoD Instruction (DoDI) 4715.5, "Management of Environmental Compliance at Overseas Installations," April 22, 1996. This guide provides criteria, standards, and management practices for environmental compliance at DoD installations overseas. Its publication number and title are DoD 4715.5-G, "Overseas Environmental Baseline Guidance Document."

This publication's predecessor, "Overseas Environmental Baseline Guidance Document," October 1992, is hereby canceled.

This guide applies to the Office of the Secretary of Defense, the Military Departments, the Chairman of the Joint Chiefs of Staff, the Combatant Commands, the Inspector General of the Department of Defense, the Defense Agencies, the DoD Field Activities, and all other organizational entities within the Department of Defense (hereafter referred to collectively as "the DoD Components").

This guide is effective immediately and its use is mandatory by all DoD Components, pursuant to DoDI 4715.5. The Heads of the DoD Components may only issue supplementary instructions when deemed necessary to provide for unique requirements within their organizations.

Send recommended changes to this document to:

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REFERENCES

(a) DoD Instruction 4715.5, "Management of Environmental Compliance at Overseas Installations," April 22, 1996

(b) Executive Order 12344, "Naval Nuclear Propulsion Program," February 1, 1982

(c) Section 7158 of title 42, United States Code

(d) Executive Order 12114, "Enviornmental Effects Abroad of Major Federal Actions," January 4, 1979

(e) DoD Instruction 4715.4, "Pollution Prevention," June 18, 1996

(f) DoD 8910-M, "DoD Procedures for Management of Information Requirements," June 1998

(g) Title 40, Code of Federal Regulations, Part 141.26(b), "Monitoring Frequency for Radioactivity in Community Water Systems," current edition

(h) DoD 6050.5-H, "Depart of Defense Hazardous Chemical Warning Labeling System," June 1989

(i) Defense Logistics Agency Instruction 4145.11, "Army Technical Manual 38-410, Naval Supply Publication 573, Air Force Joint Manual 23-209, and Marine Corps Order 4450.12A, "Storage and Handling of Hazardous Materials," January 13, 1999

(j) Air Force Joint Manual 24-204, Army Technical Order 38-250, Naval Supply Publication 505, Marine Corps Order P4030.19E, and Defense Logistics Agency Manual 4145.3, "Preparing Hazardous Materials for Military Air Shipments," March 1, 1997

(k) DoD Directive 6050.1, "Environmental Effects in the United States of DoD Actions," July 30, 1979

(l) DoD 4160.21-M, "Defense Materiel Dispostion Manual," August 18, 1997

(m) DoD Instruction 6050.5, "DoD Hazard Communication Program," October 29, 1990

(n) DoD Directive 4001.1, "Installation Management," September 4, 1986

(o) Naval Facility Manual of Operation-213, Air Force Regulation 91-8, and Army Technical Manual 5-634, "Solid Waste Management," May 1990

(p) DoD 4150.7-M, "DoD Pest Management Training and Certification Manual," April 24, 1997

(q) Military Handbook 1028/8A, "Design of Pest Management Facilities," November 1, 1991

(r) DoD Instruction 6055.1, "DoD Occupational Safety and Health Program," October 26, 1984

(s) DoD Instruction 6055.5, "Industrial Hygiene and Occupational Health," January 10, 1989

(t) Section 2643 of title 15, United States Code

(u) Title 40, Code of Federal Regulations, Part 763, "Asbestos-Containing Materials in Schools," current edition

(v) DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas," February 2, 1998

C1. CHAPTER 1

OVERVIEW

C1.1.1. The primary purpose of this Guide is to provide criteria and management practices to be used by DoD Environmental Executive Agents (EEAs) in determining Final Governing Standards (FGS) in accordance with DoD Instruction 4715.5, "Management of Environmental Compliance at Overseas Installations" (reference (a)). This Guide also establishes standards for environmental compliance at DoD installations in countries for which no FGS have been established.

C1.1.2. This Guide applies to actions of the DoD Components at installations outside the United States, its territories, and possessions.

C1.1.3. This Guide does not apply to:

C1.1.3.1. DoD installations that do not have more than de minimis potential to affect the natural environment (e.g., offices whose operations are primarily administrative, including defense attaché offices, security assistance offices, foreign buying offices and other similar organizations), or for which the DoD Components exercise control only on a temporary or intermittent basis;

C1.1.3.2. Leased, joint use and similar facilities to the extent that DoD does not control the instrumentality or operation that a criterion seeks to regulate;

C1.1.3.3. Operations of U.S. military vessels or the operations of U.S. military aircraft, or off-installation operational and training deployments. Off-installation operational deployments include cases of hostilities, contingency operations in hazardous areas, and when United States Forces are operating as part of a multi-national force not under full control of the United States. Such excepted operations and deployments shall be conducted in accordance with applicable international agreements, other DoD Directives and Instructions, and environmental annexes incorporated into operation plans or operation orders. However, this Guide does apply to support functions for U.S. military vessels and U.S. military aircraft provided by the DoD Components, including management or disposal of off-loaded waste or material;

C1.1.3.4. Facilities and activities associated with the Naval Nuclear Propulsion Program, which are covered under E.O. 12344 (reference (b)) and conducted pursuant to 42 U.S.C. 7158 (reference (c));

C1.1.3.5. The determination or conduct of remediation to correct environmental problems caused by DoD's past activities; and,

C1.1.3.6. Environmental analyses conducted under E.O. 12114 (reference (d)).

C1.1.4. For purposes of this Guide, unless otherwise indicated, the following definitions apply:

C1.1.4.1. Criteria and Management Practices. Particular substantive provisions of the OEBGD that are used by the EEA to develop FGS for a country.

C1.1.4.2. Existing Facility. Any facility and/or building, source or project in use or under construction before October 1, 1994, unless it is subsequently substantially modified.

C1.1.4.3. Final Governing Standard (FGS). A comprehensive set of country-specific substantive provisions -- typically technical limitations on effluent, discharges, etc., or a specific management practice.

C1.1.4.4. New Facility. Any facility and/or building, source or project with a construction start date on, or after, October 1, 1994, or a pre-existing facility that has been substantially modified since October 1, 1994.

C1.1.4.5. Requirements

C1.1.4.5.1. Particular provisions of U.S. law respecting environmental protection on DoD installations within CONUS.

C1.1.4.5.2. Host-nation law of general applicability, including those specifically delegated to regional or local governments for implementation, respecting environmental protection and that are generally applied to host-nation military.

C1.1.4.5.3. Applicable international treaty provisions that are used in determining the FGS. DoD installations overseas shall use the FGS as standards for environmental compliance rather than use the individual source documents that have been reconciled by the Environmental Executive Agent in the creation of the FGS.

C1.1.4.6. Substantial Modification. Any modification to a facility and/or building the cost of which exceeds $1 million, regardless of funding source.

C1.1.5. The FGS shall not expressly indicate the source of the standard, whether domestic, host nation or international agreement. Environmental Executive Agents may retain draft working documents and references used in developing FGS, but may not officially issue any compilation of such materials.

C1.1.6. DoD Instruction 4715.4, "Pollution Prevention" (reference (e)), implements

policy, assigns responsibility, and prescribes procedures for implementation of pollution prevention programs throughout DoD. Reference (e) should be consulted for particular requirements that apply, as a matter of DoD policy, to activities outside the United States. Pollution prevention should be considered in developing the criteria and management practices the FGS. Where economically advantageous and consistent with mission requirements, pollution prevention shall be the preferred means for attaining compliance with the FGS, or the OEBGD in host nations for which no FGS have been issued.

C1.1.7. When developing FGS, EEAs will ensure that, where a standard must be measured by a laboratory method and would be ambiguous without reference to an analytical method, the FGS includes a brief description of the analytical method and appropriate quality assurance/quality control procedures to be followed. Laboratory analyses necessary to implement the OEBGD or FGS should normally be conducted in a laboratory that has been certified by a U.S. or host-nation regulatory authority for the applicable test method. In the absence of a laboratory that has been so certified, laboratory analyses may also be conducted at a laboratory that has established reliable compliance with quality assurance standards for the applicable test method that are generally recognized by appropriate industry or scientific organizations.

C1.1.8. This Guide does not create any rights or obligations enforceable against the United States, the DoD, or any of its Components, nor does it create any standard of care or practice for individuals. Although this Guide refers to other DoD Directives and Instructions, it is intended only to coordinate the requirements of those directives as required to implement the policies found in reference (a). This Guide does not change other DoD Directives or Instructions or alter DoD policies.

C1.1.9. Unless other wise specified, all record-keeping requirements including assessments, inspection records, logs, manifests, notices, forms and formats described in accordance with paragraph C4.4.2., of DoD 8910.1-M, "DoD Procedures for Management of Information Requirements" (reference (f)).

C2. CHAPTER 2

AIR EMISSIONS

C2.1. SCOPE

This Chapter contains standards for air emissions sources. Criteria addressing open burning of "Solid Waste" are contained in Chapter 7, "Risk Management Plans," in Chapter 18, and "Radon," in Chapter 16 (RESERVED).

C2.2. DEFINITIONS

C2.2.1. Coal Refuse. Waste products of coal mining, cleanings and coal preparation operations (e.g., culm, gob, etc.) containing coal, matrix material, clay, and other organic and inorganic material.

C2.2.2. Cold-Cleaning Machine. Any device or piece of equipment that contains and/or uses liquid solvent, into which parts are placed to remove soils and other contaminants from the surfaces of the parts or to dry the parts. Cleaning machines that contain and use heated, nonboiling solvent to clean the parts are classified as cold-cleaning machines.

C2.2.3. Fossil Fuel. Natural gas, petroleum, coal, and any form of solid, liquid or gaseous fuel derived from such material for the purpose of creating useful heat.

C2.2.4. Freeboard Ratio. The ratio of the solvent cleaning machine freeboard height to the smaller interior dimension (length, width, or diameter) of the solvent cleaning machine.

C2.2.5. Incinerator. Any furnace used in the process of burning solid or liquid waste for the purpose of reducing the volume of the waste by removing combustible matter, including equipment with heat recovery systems for either hot water or steam generation.

C2.2.6. Motor Vehicle. Any commercially available vehicle that is not adapted to military use that is self-propelled and designed for transporting persons or property on a street or highway, including but not limited to passenger cars, light-duty vehicles, and heavy-duty vehicles.

C2.2.7. New Source. Any facility/building, source or project with a construction

start date on, or after, October 1, 1994, or a pre-existing facility that has been substantially modified since October 1, 1994.

C2.2.8. Ozone-Depleting Substances (ODS). Those substances listed in Table C2.T2.

C2.2.9. Pathological Waste. Waste material consisting of only human or animal remains, anatomical parts, and/or tissue, the bags/containers used to collect and transport the waste material, and animal bedding (if applicable).

C2.2.10. Process Heater. A device that is primarily used to heat a material to initiate or promote a chemical reaction in which the material participates as a reactant or catalyst.

C2.2.11. Pyrolysis. The endothermic gasification of hospital waste and/or medical/infectious waste using external energy.

C2.2.12. Steam-Generating Unit. A device that combusts any fuel and produces steam or heats water or any other heat transfer medium. This definition does not include nuclear steam generators or process heaters.

C2.2.13. Substantially Modified. Any modification to a facility/building the cost of which exceeds $1 million, regardless of funding source.

C2.2.14. Vapor-Cleaning Machine. A batch or in-line solvent-cleaning machine that boils liquid solvent-generating solvent vapor that is used as a part of the cleaning or drying cycle.

C2.2.15. Wood Residue. Bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood-processing and forest management operations.

C2.3. CRITERIA

C2.3.1. Steam/Hot Water-Generating Units

C2.3.1.1. Air Emission Standards for New or Substantially Modified (N/SM) Units. The following criteria apply to N/SM units with a maximum design heat input capacity greater or equal to 10 million Btu/hr:

C2.3.1.1.1. N/SM steam/hot water-generating units and associated emissions controls, if applicable, must be designed to meet the emission standards for

specific sized units shown in Table C2.T1. at all times, except during periods of start up, shut down, soot blowing, malfunction, or when emergency conditions exist.

C2.3.1.1.2. For N/SM units combusting liquid or solid fossil fuels, fuel sulfur content (weight percent) and higher heating value will be measured and recorded for each new shipment of fuel. Use this data to calculate sulfur dioxide (SO_2) emissions and document compliance with the SO_2 limits using the equation in Table C2.T1. Alternatively, install a properly calibrated and maintained continuous emissions monitoring system to measure the flue gas for SO_2 and either oxygen (O_2) or carbon dioxide (CO_2).

C2.3.1.2. Air Emissions Monitoring for N/SM Units. N/SM steam/hot water-generating units subject to opacity or NO_X standards in Table C2.T1. must have a properly calibrated and maintained continuous emissions monitoring system (CEMS) to measure the flue gas as follows:

C2.3.1.2.1. For units with a maximum design heat input capacity greater than 30 million Btu/hr: Opacity, except that CEMS, is not required where gaseous or distillate fuels are the only fuels combusted.

C2.3.1.2.2. For fossil-fuel fired units with a maximum design heat input capacity greater than 100 million Btu/hr: Nitrogen oxides (NO_X) and either oxygen (O_2) or carbon dioxide (CO_2).

C2.3.2. Incinerators. The following requirements do not apply to incinerators combusting hazardous waste, or munitions. Refer to Chapter 6 for information regarding hazardous waste disposal.

C2.3.2.1. Incinerators (Non-medical). All N/SM incinerators that have the capacity to burn more than 50 tons per day (tpd) must be designed to meet the following particulate standard: 0.18 grams per dry standard cubic meter (g/dscm) (0.08 grains per dry standard cubic foot (gr/dscf)) corrected to 12 percent CO_2.

C2.3.2.2. Sewage Sludge Incinerators. All N/SM sewage sludge incinerators that burn more than 1 tpd of sewage sludge or more than 10 percent sewage sludge must also be designed to meet a particulate emission limit of 0.65 g/kg dry sludge (1.30 lb/ton dry sludge) and an opacity limit of 20 percent at all times, except during periods of start up, shut down, malfunction, or when emergency conditions exist.

C2.3.2.3. Medical Waste Incinerators (MWI). The following standards apply to new and existing units. These requirements do not apply to any portable

units (field deployable), pyrolysis units, or units that burn only pathological, low-level radioactive waste, or chemotherapeutic waste. Existing sources must comply within 5 years of the publication date of this Guide. Refer to Chapter 8 for other requirements pertaining to medical waste management.

C2.3.2.3.1. All new and existing MWI must be designed and operated according to the following good combustion practices (GCP):

C2.3.2.3.1.1. Unit design: dual chamber.

C2.3.2.3.1.2. Minimum temperature in primary chamber: 1400-1600°F.

C2.3.2.3.1.3. Minimum temperature in secondary chamber: 1800-2200°F.

C2.3.2.3.1.4. Minimum residence time in the secondary chamber: 2 seconds.

C2.3.2.3.1.5. Incinerator operators must be trained in accordance with applicable Service requirements.

C2.3.3. Perchloroethylene (PCE) Dry-Cleaning Machines. The following requirements apply to new and existing dry-cleaning machines. These requirements do not apply to coin-operated machines. Existing sources must comply within 3 years of the publication date of this Guide.

C2.3.3.1. Emissions from existing PCE dry-cleaning machines, at installations that use more than 2000 gallons per year of PCE (installation wide) in their dry-cleaning operations, must be controlled with a refrigerated condenser, or, if already installed, a carbon absorber. The temperature of the refrigerated condenser must be maintained at 45°F or less. Dry-cleaning machines and control devices must be operated according to manufacturer recommendations.

C2.3.3.2. All new PCE dry-cleaning systems must be of the dry-to-dry design with emissions controlled by a refrigerated condenser. The temperature of the refrigerated condenser must be maintained at 45°F or less. Dry-cleaning machines and control devices must be operated according to manufacturer recommendations.

C2.3.4. Chromium Electroplating and Chromium Anodizing Tanks. The following standards apply to new and existing tanks. Existing sources must comply within 3 years of the publication date of this Guide.

C2.3.4.1. Ventilation exhaust from new and existing tanks must be controlled by a wet scrubber, composite mesh-pad eliminator, fiber bed filter, or equivalent control device capable of limiting emissions to 0.015 milligrams per dry standard cubic meter (mg/dscm). Control devices must be operated according to manufacturer recommendations.

C2.3.4.2. Alternatively, in lieu of control devices, decorative chromium and chromium anodize tanks may use chemical tank additives to prevent the surface tension from exceeding 45 dynes per centimeter provided that the surface tension is monitored prior to the first initiation of electric current on a given day and every 4 hours thereafter.

C2.3.5. Halogenated Solvent-Cleaning Machines. These requirements apply to new and existing solvent-cleaning machines that use solvent that contains more than 5 percent by weight: methylene chloride (CAS No. 75-09-2), perchloroethylene (CAS No. 127-18-4), trichloroethylene (CAS No. 79-01-6), 1,1,1-trichloroethane (CAS No. 71-55-6), carbon tetrachloride (CAS No. 56-23-5), chloroform (CAS No. 67-66-3), or any combination of these halogenated solvents. Existing sources must comply within 3 years of the publication date of this Guide.

(Note: 1,1,1-trichloroethane is an ozone-depleting substance that will eventually be phased out of existence.)

C2.3.5.1. All cold-cleaning machines (remote reservoir and immersion tanks) must be covered when not in use. Additionally, immersion-type cold-cleaning machines must have either a 1" water layer or a freeboard ratio of at least 0.75.

C2.3.5.2. All vapor-cleaning machines (vapor degreasers) must incorporate design and work practices that minimize the direct release of halogenated solvent to the atmosphere.

C2.3.6. Units Containing an Ozone Depleting Substance (ODS) Listed in Table C2.T2. The following criteria apply to direct atmospheric emissions of ODS from refrigeration and fire-suppression equipment.

C2.3.6.1. ODS Refrigerant Recovery/Recycling. All repairs or services to

appliances, industrial-process refrigeration units, air conditioning units, or motor vehicle air conditioners must be performed using commercially available refrigerant recovery/recycling equipment, operated by trained personnel.

C2.3.6.2. ODS Refrigerant Venting Prohibition. Do not intentionally release any Class I or Class II ODS refrigerant in the course of maintaining, servicing, repairing, or disposing of appliances, industrial-process refrigeration units, air conditioning units, or motor vehicle air conditioners. *De minimis* releases associated with good faith attempts to recycle or recover ODS refrigerants are not subject to this prohibition.

C2.3.6.3. ODS Fire-Suppression Agent (Halon) Venting Prohibition. Do not intentionally release halons into the environment while testing, maintaining, servicing, repairing, or disposing of halon-containing equipment or using such equipment for technician training. This venting prohibition does not apply to the following halon releases:

C2.3.6.3.1. *De minimis* releases associated with good faith attempts to recycle or recover halons (i.e., release of residual halon contained in fully discharged, total-flooding fire extinguishing systems).

C2.3.6.3.2. Emergency releases for the legitimate purpose of fire extinguishing, explosion inertion, or other emergency applications for which the equipment or systems were designed.

C2.3.6.3.3. Releases during the testing of fire-extinguishing systems if each of the following is true: systems or equipment employing suitable alternative fire-extinguishing agents are not available; release of extinguishing agent is essential to demonstrate equipment functionality; failure of system or equipment would pose great risk to human safety or the environment; and, a simulant agent cannot be used.

C2.3.7. Motor vehicles. This criteria applies to DoD-owned motor vehicles as defined in paragraph C2.2.6., above.

C2.3.7.1. Inspect all vehicles every 2 years to ensure that no one has tampered with the factory-installed emission control equipment.

C2.3.7.2. If available on the local economy, use only unleaded gasoline in vehicles that are designed for this fuel.

Table C2.T1. Emission Standards for N/SM Steam-Generating Units[a]

Fuel Type	Maximum Design Heat Input Capacity						
	10 - 100 million BTU/hr			Size >100 million BTU/hr			
	PM	**Opacity**[b]	**SO_2**[c]	**PM**	**Opacity**[b]	**SO_2**[c]	**NO_X**[d]
Gaseous	N/A	N/A	N/A	N/A	N/A	N/A	0.20
Gaseous - Coal Derived	N/A	N/A	N/A	N/A	N/A	N/A	0.50
Liquid Fossil Fuel	N/A	20%	0.50[e]	0.10	20%	0.80	0.30
Solid Fossil Fuel	0.10	20%	1.20	0.10	20%	1.20	0.70
Other Solid Fuel [f]	0.30	20%	N/A	0.20	20%	N/A	N/A

N/A = Not applicable.

a. Standards do not apply during periods of startup, shutdown, malfunction, soot blowing, or when emergency conditions exist. Unless specified otherwise, emission standards are in lb/million BTU.

b. The opacity standards do not apply to units < 30 million BTU/hr. The 20 percent standard applies to the average opacity over a 6-minute period. A 30 percent opacity value is allowed for one 6-minute period per hour.

c. SO_2 is best controlled and compliance documented by limiting fuel sulfur content.
SO_2 emissions (lb/ million BTU) = 0.02 X sulfur content of fuel (%) / heat content of fuel (HHV, million BTU/lb fuel).
[E.g., for fuel oil with 0.5 percent sulfur, SO_2 = 0.02 X 0.5 / 0.019 = 0.53 lb/million BTU.]

d. Emission limitation for NO_X is based on a 30-day rolling average. NO_X standard does not apply when a fossil fuel containing at least 25 percent by weight of coal refuse is burned in combination with gaseous, liquid, or other solid fossil fuel.

e. Instead of 0.5 lb/ million BTU of SO_2, fuel oil combustion units may comply with a 0.5 percent average fuel sulfur content limit (weight percent), which is statistically equivalent to 0.5 lb/million BTU.

f. Other solid fuels include wood- or waste-derived fuels.

Table C2.T2. Class I and II Ozone-Depleting Substances

Class I			
CFC - 11	CFC - 114	CFC - 215	Halon - 1211
CFC - 12	CFC - 115	CFC - 216	Halon - 1301
CFC - 13	CFC - 211	CFC - 217	Halon - 2402
CFC - 111	CFC - 212	CFC - 500	Carbon Tetrachloride
CFC - 112	CFC - 213	CFC - 502	Methyl Chloroform
CFC - 113	CFC - 214	CFC - 503	Methyl Bromide
Class II			
HCFC - 21	HCFC - 133	HCFC - 226	HCFC - 243
HCFC - 22	HCFC - 141(b)	HCFC - 231	HCFC - 244
HCFC - 31	HCFC - 142(b)	HCFC - 232	HCFC - 251
HCFC - 121	HCFC - 221	HCFC - 233	HCFC - 252
HCFC - 122	HCFC - 222	HCFC - 234	HCFC - 253
HCFC - 123	HCFC - 223	HCFC - 235	HCFC - 261
HCFC - 124	HCFC - 224	HCFC - 241	HCFC - 262
HCFC - 131	HCFC - 225	HCFC - 242	HCFC - 271
HCFC - 132			

C3. CHAPTER 3

DRINKING WATER

C3.1. SCOPE

This Chapter contains criteria for providing potable water.

C3.2. DEFINITIONS

C3.2.1. Action Level. The concentration of a substance in water that establishes appropriate treatment for a water system.

C3.2.2. Appropriate DoD Medical Authority. The medical professional designated by the in-theater Component commander to be responsible for resolving medical issues necessary to provide safe drinking water at the Component's installations.

C3.2.3. Community Water System (CWS). A public water system having at least 15 service connections used by year-round residents or that regularly serves at least 25 year-round residents.

C3.2.4. Concentration/Time (CT). The product of residual disinfectant concentration, C, in mg/L determined before or at the first customer, and the corresponding disinfectant contact time, T, in minutes. CT values appear in Tables C3.T11. through C3.T24.

C3.2.5. Conventional Treatment. Water treatment including chemical coagulation, flocculation, sedimentation, and filtration.

C3.2.6. Diatomaceous Earth Filtration. A water treatment process of passing water through a precoat of diatomaceous earth deposited on a support membrane while additional diatomaceous earth is continuously added to the feed water to maintain the permeability of the precoat, resulting in substantial particulate removal from the water.

C3.2.7. Direct Filtration. Water treatment including chemical coagulation, possibly flocculation, and filtration, but not sedimentation.

C3.2.8. Disinfectant. Any oxidant, including but not limited to, chlorine, chlorine dioxide, chloramines, and ozone, intended to kill or inactivate pathogenic microorganisms in water.

C3.2.9. DoD Water System. A public water system or non-public water system.

C3.2.10. Emergency Assessment. An evaluation of the susceptibility of the water source, treatment, storage and distribution system(s) to disruption of service from natural disasters, accidents, and sabotage.

C3.2.11. First Draw Sample. A one-liter sample of tap water that has been standing in plumbing at least 6 hours and is collected without flushing the tap.

C3.2.12. Groundwater Under the Direct Influence of Surface Water (GWUDISW). Any water below the surface of the ground with significant occurrence of insects or other microorganisms, algae, or large diameter pathogens such as *Giardia lamblia*; or significant and relatively rapid shifts in water characteristics, such as turbidity, temperature, conductivity, or pH, which closely correlate to climatological or surface water conditions.

C3.2.13. Lead-free. A maximum lead content of 0.2 percent for solder and flux, and 8.0 percent for pipes and fittings.

C3.2.14. Lead Service Line. A service line made of lead that connects the water main to the building inlet, and any lead pigtail, gooseneck, or other fitting that is connected to such line.

C3.2.15. Maximum Contaminant Level (MCL). The maximum permissible level of a contaminant in water that is delivered to the free-flowing outlet of the ultimate user of a public water system except for turbidity for which the maximum permissible level is measured after filtration. Contaminants added to the water under circumstances controlled by the user, except those resulting from the corrosion of piping and plumbing caused by water quality, are excluded.

C3.2.16. Non-Public Water System (NPWS). A system that does not meet the definition of a public water system; for example, a well serving a building with less than 25 people.

C3.2.17. Point-of-Entry (POE) Treatment Device. A treatment device applied to the drinking water entering a facility to reduce contaminants in drinking water throughout the facility.

C3.2.18. Point-of-Use (POU) Treatment Device. A treatment device applied to a tap to reduce contaminants in drinking water at that tap.

C3.2.19. Potable Water. Water that has been examined and treated to meet the standards in this Chapter, and has been approved as potable by the appropriate DoD medical authority.

C3.2.20. Public Water System (PWS). A system for providing piped water to the public for human consumption, if such system has at least 15 service connections or regularly serves at least 25 year-round residents. This term includes both "community water systems" that serve year-round residents and "non-community systems" along with any collection, treatment, storage, and distribution facilities under control of the operator of such systems, and any collection or pretreatment storage facilities not under such control that are used primarily in connection with such systems. A non-community system is used by intermittent users or travelers and is sub-classified into a non-transient, non-community or NTNC system and a transient, non-community or TNC system. A NTNC system could be a school or factory with its own water supply where the same people drink the water throughout the year, but not 24-hours a day. A TNC system example is a motel with its own well.

C3.2.21. Sanitary Survey. An on-site review of the water source, facilities, equipment, operation and maintenance of a public water system to evaluate the adequacy of such elements for producing and distributing potable water.

C3.2.22. Slow-Sand Filtration. Water treatment process where raw water passes through a bed of sand at a low velocity (1.2 ft/hr), resulting in particulate removal by physical and biological mechanisms.

C3.2.23. Total Trihalomethanes. The sum of the concentration in mg/L of chloroform, bromoform, dibromochloromethane, and bromodichloromethane.

C3.2.24. Underground Injection. A subsurface emplacement through a bored, drilled, driven or dug well where the depth is greater than the largest surface dimension, whenever a principle function of the well is the emplacement of any fluid.

C3.2.25. Vulnerability Assessment. An evaluation by DoD that shows

contaminants of concern either have not been used in a watershed area or the source of water for the system is not susceptible to contamination. Susceptibility is based on prior occurrence, vulnerability assessment results, environmental persistence and transport of the contaminants, and any wellhead protection program results.

C3.3. CRITERIA

C3.3.1. DoD water systems, regardless of whether they produce or purchase water, will:

C3.3.1.1. Maintain a map/drawing of the complete potable water system.

C3.3.1.2. Update the potable water system master plan at least every 5 years.

C3.3.1.3. Protect all water supply aquifers (groundwater) and surface water sources from contamination by suitable placement and construction of wells, by suitable placing of the new intake (heading) to all water treatment facilities, by siting and maintenance of septic systems and on-site treatment units, and by appropriate land use management on DoD installations.

C3.3.1.4. Conduct sanitary surveys of the water system at least every 3 years, for systems using surface water, and every 5 years, for systems using groundwater, or as warranted, including review of required water quality analyses. Off-installation surveys will be coordinated with host-nation authorities.

C3.3.1.5. Provide proper treatment for all water sources. Surface water supplies, including GWUDISW, must conform to the surface water treatment requirements set forth in Table C3.T1. Groundwater supplies, as a minimum, must be disinfected.

C3.3.1.6. Maintain a continuous positive pressure of at least 20 psi in the water distribution system.

C3.3.1.7. Perform water distribution system operation and maintenance practices consisting of:

C3.3.1.7.1. Maintenance of a disinfectant residual throughout the water distribution system (except where determined unnecessary by the appropriate DoD medical authority);

C3.3.1.7.2. Proper procedures for repair and replacement of mains (including disinfection and bacteriological testing);

C3.3.1.7.3. An effective annual water main flushing program;

C3.3.1.7.4. Proper operation and maintenance of storage tanks and reservoirs; and

C3.3.1.7.5. Maintenance of distribution system appurtenances (including hydrants and valves).

C3.3.1.8. Establish an effective cross-connection control and backflow prevention program.

C3.3.1.9. Manage underground injection on DoD installations to protect underground water supply sources. At a minimum, conduct monitoring to determine the effects of any underground injection wells on nearby groundwater supplies.

C3.3.1.10. Develop and update as necessary an emergency contingency plan to ensure the provision of potable water despite interruptions from natural disasters and service interruptions. At a minimum, the plan will include:

C3.3.1.10.1. Identification of key personnel;

C3.3.1.10.2. Procedures to restore service;

C3.3.1.10.3. Procedures to isolate damaged lines;

C3.3.1.10.4. Identification of alternative water supplies;

C3.3.1.10.5. Installation public notification procedures; and

C3.3.1.10.6. Emergency assessment.

C3.3.1.11. Use only lead-free pipe, solder, flux, and fittings in the installation or repair of water systems and plumbing systems for drinking water. Provide installation public notification concerning the lead content of materials used in distribution or plumbing systems, or the corrosivity of water that has caused leaching, which indicates a potential health threat if exposed to leaded water, and remedial actions that may be taken.

C3.3.1.12. Maintain records showing monthly operating reports for at least 3 years, and records of bacteriological results for not less than 5 years, and chemical results for not less than 10 years.

C3.3.1.13. Document corrective actions taken to correct breaches of criteria and maintain such records for at least 3 years. Cross-connection and backflow prevention testing and repair records should be kept for at least 10 years.

C3.3.1.14. Conduct vulnerability assessments.

C3.3.2. DoD water systems, regardless of whether they produce or purchase water, will, by independent testing or by validated supplier testing, ensure conformance with the following:

C3.3.2.1. Total Coliform Bacteria Requirements

C3.3.2.1.1. An installation responsible for a PWS will conduct a bacteriological monitoring program to ensure the safety of water provided for human consumption and allow evaluation with the total coliform-related MCL. The MCL is based only on the presence or absence of total coliforms. The MCL is no more than 5 percent positive samples per month for a system examining 40 or more samples a month, and no more than one positive sample per month when a system analyzes less than 40 samples per month. Further, the MCL is exceeded whenever a routine sample is positive for fecal coliforms or *E. Coli* or any repeat sample is positive for total coliforms.

C3.3.2.1.2. Each system must develop a written, site-specific monitoring plan and collect routine samples according to Table C3.T2., "Total Coliform Monitoring Frequency."

C3.3.2.1.3. Systems with initial samples testing positive for total coliforms will collect repeat samples as soon as possible, preferably the same day. Repeat sample locations are required at the same tap as the original sample plus an upstream and a downstream sample, each within five service connections of the original tap. Any additional repeat sampling that may be required will be performed according to the appropriate DoD medical authority. Monitoring will continue until total coliforms are no longer detected.

C3.3.2.1.4. When any routine or repeat sample tests positive for total coliforms, it will be tested for fecal coliform or *E. Coli.* Fecal-type testing can be

foregone on a total coliform positive sample if fecal or *E. Coli* is assumed to be present.

C3.3.2.1.5. If a system has exceeded the MCL for total coliforms, the installation will complete the notification in subsection C3.3.3., below, to:

C3.3.2.1.5.1. The appropriate DoD medical authority, as soon as possible, but in no case later than the end of the same day the command responsible for operating the PWS is notified of the result.

C3.3.2.1.5.2. The installation public as soon as possible, but not later than 72 hours after the system is notified of the test result that an acute risk to public health may exist.

C3.3.2.2. Inorganic Chemical Requirements

C3.3.2.2.1. An installation responsible for a PWS will ensure that the water distributed to end-users does not exceed applicable limitations set out in Table C3.T3. Except for Nitrate, Nitrite, and Total Nitrate/Nitrite, for systems monitored quarterly or more frequently, a system is out of compliance if the annual running average concentration of an inorganic chemical exceeds the MCL. For systems monitored annually or less frequently, a system is out of compliance if a single sample exceeds the MCL. For Nitrate, Nitrite, and Total Nitrate/Nitrite, system compliance is determined by averaging the single sample that exceeds the MCL with its confirmation sample; if this average exceeds the MCL, the system is out of compliance.

C3.3.2.2.2. Systems will be monitored for inorganic chemicals at the frequency set in Table C3.T4., "Inorganics Monitoring Requirements."

C3.3.2.2.3. If a system is out of compliance, the installation will complete the notification in subsection C3.3.3., below, as soon as possible. If the Nitrate, Nitrite, or Total Nitrate and Nitrite MCLs are exceeded, then this is considered an acute health risk and the installation will complete the notification to:

C3.3.2.2.3.1. The appropriate DoD medical authority as soon as possible, but in no case later than the end of the same day the command responsible for operating the PWS is notified of the result.

C3.3.2.2.3.2. The installation public as soon as possible, but not later than 72 hours after the system is notified of the test result. If the installation is only monitoring annually on the basis of direction from the appropriate DoD medical authority, it will immediately increase monitoring in accordance with Table C3.T4., "Inorganics Monitoring Requirements," until authorities determine the system is reliable and consistent and remedial actions completed.

C3.3.2.2.4. The MCL for Arsenic applies only to Community Water Systems (CWS).

C3.3.2.3. Fluoride Requirements

C3.3.2.3.1. An installation commander responsible for a PWS will ensure that the fluoride content of drinking water does not exceed the MCL of 4 mg/L stated in Table C3.T3., "Inorganic Chemical MCLs."

C3.3.2.3.2. Systems will be monitored for fluoride by collecting one treated water sample at the entry point to the distribution system annually for surface water systems and one every 3 years for groundwater systems. Daily monitoring is recommended for systems practicing fluoridation using the criteria in Table C3.T5., "Recommended Fluoride Concentrations at Different Temperatures."

C3.3.2.3.3. If any sample exceeds the MCL, the installation will complete the notification in subsection C3.3.3., below, as soon as possible, but in no case later than 14 days after the violation.

C3.3.2.4. Lead and Copper Requirements

C3.3.2.4.1. DoD CWS and NTNC water systems will comply with action levels (distinguished from the MCL) of 0.015 mg/L for lead and 1.3 mg/L for copper to determine if corrosion control treatment, public education, and removal of lead service lines, if appropriate, are required. Actions are triggered if the respective lead and copper levels are exceeded in more than 10 percent of all sampled taps.

C3.3.2.4.2. Affected DoD systems will conduct monitoring in accordance with Table C3.T6., "Monitoring Requirements for Lead and Copper Water Quality Parameters." High-risk sampling test sites will be targeted by conducting a materials evaluation of the distribution system. Sampling sites will be selected as stated in Table C3.T6.

C3.3.2.4.3. If an action level is exceeded, the installation will collect additional water quality samples specified in Table C3.T6. Optimal corrosion control treatment will be pursued. If action levels are exceeded after implementation of applicable corrosion control and source water treatment, lead service lines will be replaced if the lead service lines cause the lead action level to be exceeded. The installation commander will implement an education program for installation personnel (including U.S. and host nation) within 60 days and will complete the notification in subsection C3.3.3., below, as soon as possible, but in no case later than 14 days after the violation.

C3.3.2.5. Synthetic Organics Requirements

C3.3.2.5.1. An installation responsible for CWS and NTNC will ensure that synthetic organic chemicals in water distributed to people do not exceed the limitations delineated in Table C3.T7., "Synthetic Organic Chemical MCLs." For systems monitored quarterly or more frequently, a system is out of compliance if the annual running average concentration of an organic chemical exceeds the MCL. For systems monitored annually or less frequently, a system is out of compliance if a single sample exceeds the MCL.

C3.3.2.5.2. Systems will be monitored for synthetic organic chemicals according to the schedule stated in Table C3.T8., "Synthetic Organic Chemical Monitoring Requirements."

C3.3.2.5.3. If a system is out of compliance, complete the notification in subsection C3.3.3., below, as soon as possible, but in no case later than 14 days after the violation. The installation immediately will begin quarterly monitoring and will increase quarterly monitoring if the level of any contaminant is at its detection limit but less than its MCL as noted in Table C3.T8., and will continue until the installation commander determines the system is back in compliance, and any necessary remedial measures are implemented.

C3.3.2.6. Total Trihalomethanes Requirements

C3.3.2.6.1. An installation responsible for a CWS and NTNC systems that adds a disinfectant (oxidant, such as chlorine, chlorine dioxide, chloramines, or ozone) to any part of its treatment process (to include the addition of disinfectant by a local water supplier) will ensure that the MCL of 0.10 mg/L for total trihalomethanes is met in drinking water.

C3.3.2.6.2. Such systems that add a disinfectant will monitor total trihalomethanes in accordance with Table C3.T9., "Total Trihalomethane Monitoring Requirements."

C3.3.2.6.3. If a system is out of compliance, the installation will complete the notification in subsection C3.3.3., as soon as possible, but in no case later than 14 days after the violation, and undertake remedial measures.

C3.3.2.7. Radionuclide Requirements

C3.3.2.7.1. An installation responsible for a CWS and NTNC systems will test the system for conformance with the applicable radionuclide limits contained in Table C3.T10., "Radionuclide MCLs and Monitoring Requirements."

C3.3.2.7.2. Systems will perform radionuclide monitoring as stated in Table C3.T10.

C3.3.2.7.3. If the average annual MCL for gross alpha activity, total radium (or gross beta in systems serving over 100,000) is exceeded, the installation will complete the notification according to the procedures in subsection C3.3.3., below, within 14 days. Monitoring will continue until remedial actions are completed and the average annual concentration no longer exceeds the respective MCL. Continued monitoring for gross alpha-related contamination will occur quarterly, while gross beta-related monitoring will be monthly. If any gross beta MCL is exceeded, the major radioactive components will be identified.

C3.3.2.8. Surface Water Treatment Requirements. DoD water systems employing surface water sources or GWUDISW will meet the surface water treatment requirements delineated in Table C3.T1.

C3.3.2.9. Turbidity Requirements. DoD PWS filtered waters will be tested at least once every 4 hours. If the turbidity readings in Table C3.T1. are exceeded, the installation will complete the notification in subsection C3.3.3., below, as soon as possible, but in no case later than 14 days after the violation and undertake remedial action.

C3.3.2.10. Non-Public Water Systems. DoD NPWSs will be monitored as a minimum for total coliforms and disinfectant residuals periodically.

C3.3.2.11. Alternative Water Supplies. DoD installations will, if necessary,

only utilize alternative water sources including POE/POU treatment devices and bottled water supplies, which are approved by the installation commander.

C3.3.3. Notification Requirements. When a DoD water system is out of compliance as set forth in the preceding criteria, the appropriate DoD medical authority and installation personnel (U.S. and host nation) will be notified. The notice will provide a clear and readily understandable explanation of the violation, any potential adverse health effects, the population at risk, the steps that the system is taking to correct the violation, the necessity for seeking alternative water supply, if any, and any preventive measures the consumer should take until the violation is corrected. The appropriate DoD medical authority will coordinate notification of host authorities in cases where off-installation populations are at risk.

C3.3.4. System Operator Requirements. DoD installations will ensure that personnel are appropriately trained to operate DoD water systems.

Table C3.T1. Surface Water Treatment Requirements

1. Unfiltered Systems

a. Systems that use unfiltered surface water or groundwater sources under the direct influence of surface water will analyze the raw water for total coliforms or fecal coliforms at least weekly and for turbidity at least daily for a minimum of 1 year. If the total coliforms and/or fecal coliforms exceed 100/100 mL and 20/100 mL, respectively, appropriate filtration must be applied. Appropriate filtration must also be applied if turbidity exceeds one Nephelometric Turbidity Unit (NTU).

b. Disinfection must achieve at least 99.9 percent (3-log) inactivation of *Giardia lamblia* cysts and 99.99 percent (4-log) inactivation of viruses by meeting applicable CT values, as shown in Tables C3.T11. through C3.T24.

c. Disinfection systems must have redundant components to ensure uninterrupted disinfection during operational periods.

d. Disinfectant residual monitoring immediately after disinfection is required once every 4 hours that the system is in operation. Disinfectant residual measurements in the distribution system will be made weekly.

e. Disinfectant residual of water entering the distribution system must be maintained at a minimum of 0.2 mg/L.

f. Water in a distribution system with a heterotrophic bacteria concentration less than or equal to 500/ml measured as heterotrophic plate count is considered to have a detectable disinfectant residual for the purpose of determining compliance with the Surface Water Treatment Requirements.

g. If disinfectant residuals in the distribution system are undetected in more than 5 percent of monthly samples for 2 consecutive months, appropriate filtration must be implemented.

2. Filtered Systems

a. Filtered water systems will provide a combination of disinfection and filtration that achieves a total of 99.9 percent (3-log) removal of *Giardia lamblia* cysts and 99.99 percent (4-log) removal of viruses.

b. The turbidity of filtered water will be monitored at least once every 4 hours. (USACHPPM/USAEC). The turbidity of filtered water will not exceed 0.5 NTU (1 NTU for slow-sand and diatomaceous earth filters) in 95 percent of the analyses in a month, with a maximum of 5 NTU.

c. Disinfection must provide the remaining log-removal of *Giardia lamblia* cysts and viruses not obtained by the filtration technology applied.*

d. Disinfection residual maintenance and monitoring requirements are the same as those for unfiltered systems.

*Proper conventional treatment typically removes 2.5 log Giardia/ 2.0 log viruses. Proper direct filtration and diatomaceous earth filtration remove 2.0 log Giardia/ 1.0 log viruses. Slow-sand filtration removes typically removes 2.0 log Giardia/ 2.0 log viruses. Less log-removal may be assumed if treatment is not properly applied.

Table C3.T2. Total Coliform Monitoring Frequency

Population Served	Number of Samples [1]	Population Served	Number of Samples [1]
25 to 1,000 [2]	1	59,001 to 70,000	70
1,001 to 2,500	2	70,001 to 83,000	80
2,501 to 3,300	3	83,001 to 96,000	90
3,301 to 4,100	4	96,001 to 130,000	100
4,101 to 4,900	5	130,001 to 220,000	120
4,901 to 5,800	6	220,001 to 320,000	150
5,801 to 6,700	7	320,001 to 450,000	180
6,701 to 7,600	8	450,001 to 600,000	210
7,601 to 8,500	9	600,001 to 780,000	240
8,501 to 12,900	10	780,001 to 970,000	270
12,901 to 17,200	15	970,001 to 1,230,000	300
17,201 to 21,500	20	1,230,001 to 1,520,000	330
21,501 to 25,000	25	1,520,001 to 1,850,000	360
25,001 to 33,000	30	1,850,001 to 2,270,000	390
33,001 to 41,000	40	2,270,001 to 3,020,000	420
41,001 to 50,000	50	3,020,001 to 3,960,000	450
50,001 to 59,000	60	3,960,001 or more	480

Notes

1. Minimum Number of Routine Samples Per Month.

2. A non-community water system using groundwater and serving 1,000 or less people may monitor once in each calendar quarter during which the system provides water provided a sanitary survey conducted within the last 5 years shows the system is supplied solely by a protected groundwater source and free of sanitary defects.

Systems serving less than 4,900 people who use groundwater and collect samples from different sites may collect all samples on a single day. All other systems must collect samples at regular intervals throughout the month.

Table C3.T3. Inorganic Chemical MCLs

Contaminant	MCL	
Arsenic (CWS only)	0.05	mg/L
Antimony [1]	0.006	mg/L
Asbestos [1]	7 million	fibers/L (longer than 10 um)
Barium	2.0	mg/L
Beryllium [1]	0.004	mg/L
Cadmium [1]	0.005	mg/L
Chromium [1]	0.1	mg/L
Cyanide [1]	0.2	mg/L (as free cyanide)
Fluoride [2]	4.0	mg/L
Mercury [1]	0.002	mg/L
Nickel [1]	0.1	mg/L
Nitrate [3]	10	mg/L (as N)
Nitrite [3]	1	mg/L (as N)
Total Nitrite and Nitrate [3]	10	mg/L (as N)
Selenium [1]	0.05	mg/L
Sodium [4]		
Thallium	0.002	mg/L

Notes

1. MCLs apply to CWS and NTNC systems.
2. Fluoride also has a secondary MCL at 2.0 mg/L. MCL applies only to CWS.
3. MCLs apply to CWS, NTNC, and TNC systems.
4. No MCL established. Monitoring is required so concentration levels can be made available on request. Sodium levels shall be reported to the DoD medical authority upon receipt of analysis.

Table C3.T4. Inorganics Monitoring Requirements

Contaminant	Groundwater Baseline Requirement [1]	Surface Water Baseline Requirement	Trigger That Increases Monitoring [2]	Reduced Monitoring
Arsenic	1 sample / 3 yr	Annual sample	>MCL	---
Antimony	1 sample / 3 yr	Annual sample	>MCL	---
Barium	1 sample / 3 yr	Annual sample	>MCL	---
Beryllium	1 sample / 3 yr	Annual sample	>MCL	---
Cadmium	1 sample / 3 yr	Annual sample	>MCL	---
Chromium	1 sample / 3 yr	Annual sample	>MCL	---
Cyanide	1 sample / 3 yr	Annual sample	>MCL	---
Fluoride	1 sample / 3 yr	Annual sample	>MCL	
Mercury	1 sample / 3 yr	Annual sample	>MCL	---
Nickel	1 sample / 3 yr	Annual sample	>MCL	---
Selenium	1 sample / 3 yr	Annual sample	>MCL	---
Thallium	1 sample / 3 yr	Annual sample	>MCL	---
Sodium	1 sample / 3 yr	Annual sample	---	---
Asbestos	1 sample every 9 years	1 sample every 9 years	>MCL	Yes [3]
Total Nitrate/Nitrite	Annual sample	Quarterly	>50% Nitrite MCL	---
Nitrate	Annual sample [4]	Quarterly [4]	>50% MCL [5]	Yes [6]
Nitrite	Annual sample [4]	Quarterly [4]	>50% MCL [5]	Yes [7]
Corrosivity [8]	Once	Once	---	---

Notes

1. Samples shall be taken as follows: groundwater systems shall take a minimum of one sample at every entry point to the distribution system which is representative of each well after treatment; surface water systems shall take at least one sample at every entry point to the distribution system after any application of treatment or in the distribution system at a point that is representative of each source after the treatment.

2. Increased quarterly monitoring requires a minimum of two samples per quarter for groundwater systems and at least four samples per quarter for surface water systems.

3. Necessity for analysis is predicated upon a vulnerability assessment conducted by the PWS.

4. Any sampling point with an analytical value greater than or equal to 0.5 mg/L as N, (50 percent of the Nitrite MCL) must begin sampling for nitrate and nitrite separately. Since nitrite readily converts to nitrate, a system can conclude that if the total nitrate/nitrite value of a sample is less than half of the nitrite MCL, then the value of nitrite in the sample would also be below half of its MCL.

5. Increased quarterly monitoring shall be undertaken for nitrate and nitrate if a sample is >50 percent of the MCL.

6. The appropriate DoD medical authority may reduce repeat sampling frequency for surface water systems to annually if after 1 year results are <50 percent of MCL.

7. The appropriate DoD medical authority may reduce repeat sampling frequency to one annual sample if results are 50 percent of MCL.

8. PWSs shall be analyzed within 1 year of the effective date of country specific final governing standards to determine the corrosivity entering the distribution system. Two samples (one mid-winter and one mid-summer) will be collected at the entry point of the distribution system for systems using surface water and GWUDISW. One sample will be collected for systems using only groundwater. Corrosivity characteristics of the water shall include measurements of pH, calcium, hardness, alkalinity, temperature, total dissolved solids, and calculation of the Langelier Index.

Table C3.T5. Recommended Fluoride Concentrations at Different Temperatures

Annual Average of Maximum Daily Air Temperatures (°F)	**Control Limits (mg/L)**		
	Lower	**Optimum**	**Upper**
50.0 - 53.7	0.9	1.2	1.7
53.8 - 58.3	0.8	1.1	1.5
58.4 - 63.8	0.8	1.0	1.3
63.9 - 70.6	0.7	0.9	1.2
70.7 - 79.2	0.7	0.8	1.0
79.3 - 90.5	0.6	0.7	0.8

Table C3.T6. Monitoring Requirements for Lead and Copper Water Quality Parameters

Population Served	**No. of Sites for Standard Monitoring [1, 2]**	**No. of Sites for Reduced Monitoring [3]**	**No. of Sites for Water Quality Parameters [4]**
>100,000	100	50	25
10,001 - 100,000	60	30	10
3,301 - 10,000	40	20	3
501 - 3,300	20	10	2
101 - 500	10	5	1
<100	5	5	1

Notes

1. Every 6 months for lead and copper.

2. Sampling sites shall be based on a hierarchical approach. For CWS, priority will be given to single family residences that contain copper pipe with lead solder installed after 1982, contain lead pipes, or are served by lead service lines; then, structures, including multifamily residences, with the foregoing characteristics; and finally, residences and structures with copper pipe with lead solder installed before 1983. For NTNC systems, sampling sites will consist of structures that contain copper pipe with lead solder installed after 1982, contain lead pipes, and/or are served by lead service lines. First draw samples will be collected from a cold water kitchen or bathroom tap; non-residential samples will be taken at an interior tap from which water is typically drawn for consumption.

3. Annually for lead and copper if action levels are met during each of two consecutive 6-month monitoring periods. Any small or medium-sized system (<50,000) that meets the lead and copper action levels during 3 consecutive years may reduce the monitoring for lead and copper from annually to once every 3 years. Annual or triennial sampling will be conducted during the four warmest months of the year.

4. This monitoring must be conducted by all large systems (>50,000). Small and medium-sized systems must monitor water quality parameters when action levels are exceeded. Samples will be representative of water quality throughout the distribution system and include a sample from the entry to the distribution system. Samples will be taken in duplicate for pH, alkalinity, calcium, conductivity or total dissolved solids, and water temperatures to allow a corrosivity determination (via a Langelier saturation index or other appropriate saturation index); additional parameters are orthophosphate when a phosphate inhibitor is used and silica when a silicate inhibitor is used.

Table C3.T7. Synthetic Organic Chemical MCLs

Synthetic Organic Chemical	mg/L	Detection limit, mg/L
Pesticides/PCBs		
Alachlor	0.002	0.0002
Aldicarb	0.003	0.0005
Aldicarb sulfone	0.003	0.0008
Aldicarb sulfoxide	0.004	0.0005
Atrazine	0.003	0.0001
Benzo[a]pyrene	0.0002	
Carbofuran	0.04	0.0009
Chlordane	0.002	0.0002
Dalapon	0.2	
2,4-D	0.07	0.0001
1,2-Dibromo-3-chloropropane (DBCP)	0.0002	0.00002
Di (2-ethylhexyl) adipate	0.4	
Di (2-ethylhexyl) phthalate	0.006	
Dinoseb	0.007	
Diquat	0.02	
Endrin	0.002	0.00002
Endothall	0.1	
Ethylene dibromide (EDB)	0.00005	0.00001
Glyphosphate	0.7	
Heptachlor	0.0004	0.00004
Heptachlorepoxide	0.0002	0.00002
Hexachlorobenzene	0.001	
Hexachlorocyclopentadiene	0.05	
Lindane	0.0002	0.00002
Methoxychlor	0.04	0.0001
Oxamyl (Vydate)	0.2	
PCBs (as decachlorobiphenyls)	0.0005	0.0001
Pentachlorophenol	0.001	0.00004
Picloram	0.5	
Simazine	0.004	
2,3,7,8-TCDD (Dioxin)	0.00000003	
Toxaphene	0.003	0.001
2,4,5-TP (Silvex)	0.05	0.0002

Table C3.T7. Synthetic Organic Chemical MCLs--Continued

Synthetic Organic Chemical	mg/L	Detection limit, mg/L
Volatile Organic Chemicals		
Benzene	0.005	0.0005
Carbon tetrachloride	0.005	0.0005
o-Dichlorobenzene	0.6	0.0005
cis-1,2-Dichloroethylene	0.07	0.0005
trans-1,2-Dichloroethylene	0.1	0.0005
1,1-Dichloroethylene	0.007	0.0005
1,1,1-Trichloroethane	0.20	0.0005
1,2-Dichloroethane	0.005	0.0005
Dichloromethane	0.005	
1,1,2-Trichloroethane	0.005	
1,2,4-Trichloro-benzene	0.07	
1,2-Dichloropropane	0.005	0.0005
Ethylbenzene	0.7	0.0005
Monochlorobenzene	0.1	0.0005
para-Dichlorobenzene	0.075	0.0005
Styrene	0.1	0.0005
Tetrachloroethylene	0.005	0.0005
Trichloroethylene	0.005	0.0005
Toluene	1.0	0.0005
Vinyl chloride	0.002	0.0005
Xylene (total)	10	0.0005
Other Organics		
Acrylamide	0.05% dosed at 1 ppm [1]	
Epihydrochlorin	treatment technique 0.01% dosed at 20 ppm [1]	

Note

[1] Only applies when adding these polymer flocculants to the treatment process. No sampling is required, the system certifies that dosing is within specified limits.

Table C3.T8. Synthetic Organic Chemical Monitoring Requirements

Contaminant	Base Requirement [1]		Trigger for more monitoring [2]	Reduced Monitoring
	Ground Water	Surface Water		
VOCs	Quarterly	Quarterly	>0.0005 mg/L	Yes [3, 4]
Pesticides/PCBs	Four quarterly samples/3 yrs during most likely period for their presence		>Detection limit [5]	Yes [4, 6]

Notes

1. Groundwater systems shall take a minimum of one sample at every entry point which is representative of each well after treatment; surface water systems will take a minimum of one sample at every entry point to the distribution system at a point that is representative of each source after treatment. For CWS, monitoring compliance is to be met within 1 year of the publishing of the OEBGD (FGS); for NTNC, compliance is to be met within 2 years of the publishing of the OEBGD (FGS).

2. Increased monitoring requires a minimum of two samples per quarter for groundwater systems and at least four samples per quarter for surface water systems.

3. Repeat sampling frequency may be reduced to annually after 1 year of no detection and every 3 years after three rounds of no detection.

4. Monitoring frequency may be reduced if warranted based on a vulnerability assessment by the PWS.

5. Detection limits noted in Table C3.T7., or as determined by the best available testing methodology.

6. Repeat sampling frequency may be reduced to the following if after one round of no detection: systems >3,300 reduce to two samples/year every 3 years, or systems <3,300 reduce to one sample every 3 years.

Note: Compliance is based on an annual running average for each sample point for systems monitoring quarterly or more frequently; for systems monitoring annually or less frequently, compliance is based on a single sample, unless the appropriate DoD medical authority requests a confirmation sample. A system is out of compliance if any contaminant exceeds the MCL.

Table C3.T9. Total Trihalomethane Monitoring Requirements

Population Served by System	Number of Samples Per Distribution System	Frequency of Samples	Type of Sample
10,000 or more	4	Quarterly	Treated
Less than 10,000	1	Annually	Treated

Notes

1. One of the samples must be taken at a location in the distribution system reflecting the maximum residence time of water in the system. The remaining samples shall be taken at representative points in the distribution system. Systems using groundwater sources that add a disinfectant should have one sample analyzed for maximum total trihalomethane potential. Systems employing surface water sources, in whole or in part, that add a disinfectant should have one sample analyzed for total trihalomethanes.

2. Compliance is based upon a running yearly average of quarterly samples for systems serving more than 10,000 people. Noncompliance exists if the average exceeds the MCL, 0.10 mg/L. For systems serving less than 10,000 that have a maximum total trihalomethane potential sample exceeding the MCL, a sample for total trihalomethanes shall be analyzed. If the total trihalomethane sample exceeds the MCL, noncompliance results.

Table C3.T10. Radionuclide MCLs and Monitoring Requirements

MCLs Contaminant	pCi/L
Gross Alpha [1]	15
Combined Radium-226 and -228	5
Gross Beta [2]	50

Notes

1. Gross alpha activity includes radium-226, but excludes radon and uranium.

2. Monitoring for gross beta is only required for surface water systems over 100,000. Gross beta activity refers to the sum of beta particle and photon activity from manmade radionuclides. If gross beta exceed the MCL, i.e., equivalence to a dose of 4 millirem/year, the individual components must be determined (Strontium-90 and Tritium). See 40 CFR 141.26(b) (reference (g)) for additional information.

Monitoring Requirements

For gross alpha activity and radium-226 and radium-228, systems will be tested once every 4 years. Testing will be conducted using an annual composite of four consecutive quarterly samples or the average of four samples obtained at quarterly intervals at a representative point in the distribution system.

Gross alpha only may be analyzed if activity is $\leq$5 pCi/L. Where radium-228 may be present, radium-226 and/or -228 analyses should be performed when activity is >2 pCi/L. If the average annual concentration is less than half the maximum contaminant level, analysis of a single sample may be substituted for the quarterly sampling procedure. A system with two or more sources having different concentrations of radioactivity shall monitor source water in addition to water from a free-flowing tap. If the installation introduces a new water source, these contaminants will be monitored within the first year after introduction.

Table C3.T11. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 0.5°C or Lower*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	23	46	69	91	114	137	27	54	82	109	136	163	33	65	98	130	163	195	40	79	119	158	198	237
0.6	24	47	71	94	118	141	28	56	84	112	140	168	33	67	100	133	167	200	40	80	120	159	199	239
0.8	24	48	73	97	121	145	29	57	86	115	143	172	34	68	103	137	171	205	41	82	123	164	205	246
1	25	49	74	99	123	148	29	59	88	117	147	176	35	70	105	140	175	210	42	84	127	169	211	253
1.2	25	51	76	101	127	152	30	60	90	120	150	180	36	72	108	143	179	215	43	86	130	173	216	259
1.4	26	52	78	103	129	155	31	61	92	123	153	184	37	74	111	147	184	221	44	89	133	177	222	266
1.6	26	52	79	105	131	157	32	63	95	126	158	189	38	75	113	151	188	226	46	91	137	182	228	273
1.8	27	54	81	108	135	162	32	64	97	129	161	193	39	77	116	154	193	231	47	93	140	186	233	279
2	28	55	83	110	138	165	33	66	99	131	164	197	39	79	118	157	197	236	48	95	143	191	238	286
2.2	28	56	85	113	141	169	34	67	101	134	168	201	40	81	121	161	202	242	50	99	149	198	248	297
2.4	29	57	86	115	143	172	34	68	103	137	171	205	41	82	124	165	206	247	50	99	149	199	248	298
2.6	29	58	88	117	146	175	35	70	105	139	174	209	42	84	126	168	210	252	51	101	152	203	253	304
2.8	30	59	89	119	148	178	36	71	107	142	178	213	43	86	129	171	214	257	52	103	155	207	258	310
3	30	60	91	121	151	181	36	72	109	145	181	217	44	87	131	174	218	261	53	105	158	211	263	316

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	46	92	139	185	231	277	55	110	165	219	274	329	65	130	195	260	325	390
0.6	48	95	143	191	238	286	57	114	171	228	285	342	68	136	204	271	339	407
0.8	49	98	148	197	246	295	59	118	177	236	295	354	70	141	211	281	352	422
1	51	101	152	203	253	304	61	122	183	243	304	365	73	146	219	291	364	437
1.2	52	104	157	209	261	313	63	125	188	251	313	376	75	150	226	301	376	451
1.4	54	107	161	214	268	321	65	129	194	258	323	387	77	155	232	309	387	464
1.6	55	110	165	219	274	329	66	132	199	265	331	397	80	159	239	318	398	477
1.8	56	113	169	225	282	338	68	136	204	271	339	407	82	163	245	326	408	489
2	58	115	173	231	288	346	70	139	209	278	348	417	83	167	250	333	417	500
2.2	59	118	177	235	294	353	71	142	213	284	355	426	85	170	256	341	426	511
2.4	60	120	181	241	301	361	73	145	218	290	363	435	87	174	261	348	435	522
2.6	61	123	184	245	307	368	74	148	222	296	370	444	89	178	267	355	444	533
2.8	63	125	188	250	313	375	75	151	226	301	377	452	91	181	272	362	453	543
3	64	127	191	255	318	382	77	153	230	307	383	460	92	184	276	368	460	552

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T12. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 5.0°C*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	16	32	49	65	81	97	20	39	59	78	98	117	23	46	70	93	116	139	28	55	83	111	138	166
0.6	17	33	50	67	83	100	20	40	60	80	100	120	24	48	72	95	119	143	29	57	86	114	143	171
0.8	17	34	52	69	86	103	20	41	61	81	102	122	24	49	73	97	122	146	29	58	88	117	146	175
1	18	35	53	70	88	105	21	42	63	83	104	125	25	50	75	99	124	149	30	60	90	119	149	179
1.2	18	36	54	71	89	107	21	42	64	85	106	127	25	51	76	101	127	152	31	61	92	122	153	183
1.4	18	36	55	73	91	109	22	43	65	87	108	130	26	52	78	103	129	155	31	62	94	125	156	187
1.6	19	37	56	74	93	111	22	44	66	88	110	132	26	53	79	105	132	158	32	64	96	128	160	192
1.8	19	38	57	76	95	114	23	45	68	90	113	135	27	54	81	108	135	162	33	65	98	131	163	196
2	19	39	58	77	97	116	23	46	69	92	115	138	28	55	83	110	138	165	33	67	100	133	167	200
2.2	20	39	59	79	98	118	23	47	70	93	117	140	28	56	85	113	141	169	34	68	102	136	170	204
2.4	20	40	60	80	100	120	24	48	72	95	119	143	29	57	86	115	143	172	35	70	105	139	174	209
2.6	20	41	61	81	102	122	24	49	73	97	122	146	29	58	88	117	146	175	36	71	107	142	178	213
2.8	21	41	62	83	103	124	25	49	74	99	123	148	30	59	89	119	148	178	36	72	109	145	181	217
3	21	42	63	84	105	126	25	50	76	101	126	151	30	61	91	121	152	182	37	74	111	147	184	221

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	33	66	99	132	165	198	39	79	118	157	197	236	47	93	140	186	233	279
0.6	34	68	102	136	170	204	41	81	122	163	203	244	49	97	146	194	243	291
0.8	35	70	105	140	175	210	42	84	126	168	210	252	50	100	151	201	251	301
1	36	72	108	144	180	216	43	87	130	173	217	260	52	104	156	208	260	312
1.2	37	74	111	147	184	221	45	89	134	178	223	267	53	107	160	213	267	320
1.4	38	76	114	151	189	227	46	91	137	183	228	274	55	110	165	219	274	329
1.6	39	77	116	155	193	232	47	94	141	187	234	281	56	112	169	225	281	337
1.8	40	79	119	159	198	238	48	96	144	191	239	287	58	115	173	230	288	345
2	41	81	122	162	203	243	49	98	147	196	245	294	59	118	177	235	294	353
2.2	41	83	124	165	207	248	50	100	150	200	250	300	60	120	181	241	301	361
2.4	42	84	127	169	211	253	51	102	153	204	255	306	61	123	184	245	307	368
2.6	43	86	129	172	215	258	52	104	156	208	260	312	63	125	188	250	313	375
2.8	44	88	132	175	219	263	53	106	159	212	265	318	64	127	191	255	318	382
3	45	89	134	179	223	268	54	108	162	216	270	324	65	130	195	259	324	389

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T13. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 10°C*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	12	24	37	49	61	73	15	29	44	59	73	88	17	35	52	69	87	104	21	42	63	83	104	125
0.6	13	25	38	50	63	75	15	30	45	60	75	90	18	36	54	71	89	107	21	43	64	85	107	128
0.8	13	26	39	52	65	78	15	31	46	61	77	92	18	37	55	73	92	110	22	44	66	87	109	131
1	13	26	40	53	66	79	16	31	47	63	78	94	19	37	56	75	93	112	22	45	67	89	112	134
1.2	13	27	40	53	67	80	16	32	48	63	79	95	19	38	57	76	95	114	23	46	69	91	114	137
1.4	14	27	41	55	68	82	16	33	49	65	82	98	19	39	58	77	97	116	23	47	70	93	117	140
1.6	14	28	42	55	69	83	17	33	50	66	83	99	20	40	60	79	99	119	24	48	72	96	120	144
1.8	14	29	43	57	72	86	17	34	51	67	84	101	20	41	61	81	102	122	25	49	74	98	123	147
2	15	29	44	58	73	87	17	35	52	69	87	104	21	41	62	83	103	124	25	50	75	100	125	150
2.2	15	30	45	59	74	89	18	35	53	70	88	105	21	42	64	85	106	127	26	51	77	102	128	153
2.4	15	30	45	60	75	90	18	36	54	71	89	107	22	43	65	86	108	129	26	52	79	105	131	157
2.6	15	31	46	61	77	92	18	37	55	73	92	110	22	44	66	87	109	131	27	53	80	107	133	160
2.8	16	31	47	62	78	93	19	37	56	74	93	111	22	45	67	89	112	134	27	54	82	109	136	163
3	16	32	48	63	79	95	19	38	57	75	94	113	23	46	69	91	114	137	28	55	83	111	138	166

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	25	50	75	99	124	149	30	59	89	118	148	177	35	70	105	139	174	209
0.6	26	51	77	102	128	153	31	61	92	122	153	183	36	73	109	145	182	218
0.8	26	53	79	105	132	158	32	63	95	126	158	189	38	75	113	151	188	226
1	27	54	81	108	135	162	33	65	98	130	163	195	39	78	117	156	195	234
1.2	28	55	83	111	138	166	33	67	100	133	167	200	40	80	120	160	200	240
1.4	28	57	85	113	142	170	34	69	103	137	172	206	41	82	124	165	206	247
1.6	29	58	87	116	145	174	35	70	106	141	176	211	42	84	127	169	211	253
1.8	30	60	90	119	149	179	36	72	108	143	179	215	43	86	130	173	216	259
2	30	61	91	121	152	182	37	74	111	147	184	221	44	88	133	177	221	265
2.2	31	62	93	124	155	186	38	75	113	150	188	225	45	90	136	181	226	271
2.4	32	63	95	127	158	190	38	77	115	153	192	230	46	92	138	184	230	276
2.6	32	65	97	129	162	194	39	78	117	156	195	234	47	94	141	187	234	281
2.8	33	66	99	131	164	197	40	80	120	159	199	239	48	96	144	191	239	287
3	34	67	101	134	168	201	41	81	122	162	203	243	49	97	146	195	243	292

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T14. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 15°C*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	8	16	25	33	41	49	10	20	30	39	49	59	12	23	35	47	58	70	14	28	42	55	69	83
0.6	8	17	25	33	42	50	10	20	30	40	50	60	12	24	36	48	60	72	14	29	43	57	72	86
0.8	9	17	26	35	43	52	10	20	31	41	51	61	12	24	37	49	61	73	15	29	44	59	73	88
1	9	18	27	35	44	53	11	21	32	42	53	63	13	25	38	50	63	75	15	30	45	60	75	90
1.2	9	18	27	36	45	54	11	21	32	43	53	64	13	25	38	51	63	76	15	31	46	61	77	92
1.4	9	18	28	37	46	55	11	22	33	43	54	65	13	26	39	52	65	78	16	31	47	63	78	94
1.6	9	19	28	37	47	56	11	22	33	44	55	66	13	26	40	53	66	79	16	32	48	64	80	96
1.8	10	19	29	38	48	57	11	23	34	45	57	68	14	27	41	54	68	81	16	33	49	65	82	98
2	10	19	29	39	48	58	12	23	35	46	58	69	14	28	42	55	69	83	17	33	50	67	83	100
2.2	10	20	30	39	49	59	12	23	35	47	58	70	14	28	43	57	71	85	17	34	51	68	85	102
2.4	10	20	30	40	50	60	12	24	36	48	60	72	14	29	43	57	72	86	18	35	53	70	88	105
2.6	10	20	31	41	51	61	12	24	37	49	61	73	15	29	44	59	73	88	18	36	54	71	89	107
2.8	10	21	31	41	52	62	12	25	37	49	62	74	15	30	45	59	74	89	18	36	55	73	91	109
3	11	21	32	42	53	63	13	25	38	51	63	76	15	30	46	61	76	91	19	37	56	74	93	111

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	17	33	50	66	83	99	20	39	59	79	98	118	23	47	70	93	117	140
0.6	17	34	51	68	85	102	20	41	61	81	102	122	24	49	73	97	122	146
0.8	18	35	53	70	88	105	21	42	63	84	105	126	25	50	76	101	126	151
1	18	36	54	72	90	108	22	43	65	87	108	130	26	52	78	104	130	156
1.2	19	37	56	74	93	111	22	45	67	89	112	134	27	53	80	107	133	160
1.4	19	38	57	76	95	114	23	46	69	91	114	137	28	55	83	110	138	165
1.6	19	39	58	77	97	116	24	47	71	94	118	141	28	56	85	113	141	169
1.8	20	40	60	79	99	119	24	48	72	96	120	144	29	58	87	115	144	173
2	20	41	61	81	102	122	25	49	74	98	123	147	30	59	89	118	148	177
2.2	21	41	62	83	103	124	25	50	75	100	125	150	30	60	91	121	151	181
2.4	21	42	64	85	106	127	26	51	77	102	128	153	31	61	92	123	153	184
2.6	22	43	65	86	108	129	26	52	78	104	130	156	31	63	94	125	157	188
2.8	22	44	66	88	110	132	27	53	80	106	133	159	32	64	96	127	159	191
3	22	45	67	89	112	134	27	54	81	108	135	162	33	65	98	130	163	195

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T15. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 20°C*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	6	12	18	24	30	36	7	15	22	29	37	44	9	17	26	35	43	52	10	21	31	41	52	62
0.6	6	13	19	25	32	38	8	15	23	30	38	45	9	18	27	36	45	54	11	21	32	43	53	64
0.8	7	13	20	26	33	39	8	15	23	31	38	46	9	18	28	37	46	55	11	22	33	44	55	66
1	7	13	20	26	33	39	8	16	24	31	39	47	9	19	28	37	47	56	11	22	34	45	56	67
1.2	7	13	20	27	33	40	8	16	24	32	40	48	10	19	29	38	48	57	12	23	35	46	58	69
1.4	7	14	21	27	34	41	8	16	25	33	41	49	10	19	29	39	48	58	12	23	35	47	58	70
1.6	7	14	21	28	35	42	8	17	25	33	42	50	10	20	30	39	49	59	12	24	36	48	60	72
1.8	7	14	22	29	36	43	9	17	26	34	43	51	10	20	31	41	51	61	12	25	37	49	62	74
2	7	15	22	29	37	44	9	17	26	35	43	52	10	21	31	41	52	62	13	25	38	50	63	75
2.2	7	15	22	29	37	44	9	18	27	35	44	53	11	21	32	42	53	63	13	26	39	51	64	77
2.4	8	15	23	30	38	45	9	18	27	36	45	54	11	22	33	43	54	65	13	26	39	52	65	78
2.6	8	15	23	31	38	46	9	18	28	37	46	55	11	22	33	44	55	66	13	27	40	53	67	80
2.8	8	16	24	31	39	47	9	19	28	37	47	56	11	22	34	45	56	67	14	27	41	54	68	81
3	8	16	24	31	39	47	10	19	29	38	48	57	11	23	34	45	57	68	14	28	42	55	69	83

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	12	25	37	49	62	74	15	30	45	59	74	89	18	35	53	70	88	105
0.6	13	26	39	51	64	77	15	31	46	61	77	92	18	36	55	73	91	109
0.8	13	26	40	53	66	79	16	32	48	63	79	95	19	38	57	75	94	113
1	14	27	41	54	68	81	16	33	49	65	82	98	20	39	59	78	98	117
1.2	14	28	42	55	69	83	17	33	50	67	83	100	20	40	60	80	100	120
1.4	14	28	43	57	71	85	17	34	52	69	86	103	21	41	62	82	103	123
1.6	15	29	44	58	73	87	18	35	53	70	88	105	21	42	63	84	105	126
1.8	15	30	45	59	74	89	18	36	54	72	90	108	22	43	65	86	108	129
2	15	30	46	61	76	91	18	37	55	73	92	110	22	44	66	88	110	132
2.2	16	31	47	62	78	93	19	38	57	75	94	113	23	45	68	90	113	135
2.4	16	32	48	63	79	95	19	38	58	77	96	115	23	46	69	92	115	138
2.6	16	32	49	65	81	97	20	39	59	78	98	117	24	47	71	94	118	141
2.8	17	33	50	66	83	99	20	40	60	79	99	119	24	48	72	95	119	143
3	17	34	51	67	84	101	20	41	61	81	102	122	24	49	73	97	122	146

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T16. CT Values for Inactivation of *Giardia* Cysts by Free Chlorine at 25°C*

Chlorine Concentration (mg/L)	pH < = 6 Log Inactivations						pH = 6.5 Log Inactivations						pH = 7.0 Log Inactivations						pH = 7.5 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	4	8	12	16	20	24	5	10	15	19	24	29	6	12	18	23	29	35	7	14	21	28	35	42
0.6	4	8	13	17	21	25	5	10	15	20	25	30	6	12	18	24	30	36	7	14	22	29	36	43
0.8	4	9	13	17	22	26	5	10	16	21	26	31	6	12	19	25	31	37	7	15	22	29	37	44
1	4	9	13	17	22	26	5	10	16	21	26	31	6	12	19	25	31	37	8	15	23	30	38	45
1.2	5	9	14	18	23	27	5	11	16	21	27	32	6	13	19	25	32	38	8	15	23	31	38	46
1.4	5	9	14	18	23	27	6	11	17	22	28	33	7	13	20	26	33	39	8	16	24	31	39	47
1.6	5	9	14	19	23	28	6	11	17	22	28	33	7	13	20	27	33	40	8	16	24	32	40	48
1.8	5	10	15	19	24	29	6	11	17	23	28	34	7	14	21	27	34	41	8	16	25	33	41	49
2	5	10	15	19	24	29	6	12	18	23	29	35	7	14	21	27	34	41	8	17	25	33	42	50
2.2	5	10	15	20	25	30	6	12	18	23	29	35	7	14	21	28	35	42	9	17	26	34	43	51
2.4	5	10	15	20	25	30	6	12	18	24	30	36	7	14	22	29	36	43	9	17	26	35	43	52
2.6	5	10	16	21	26	31	6	12	19	25	31	37	7	15	22	29	37	44	9	18	27	35	44	53
2.8	5	10	16	21	26	31	6	12	19	25	31	37	8	15	23	30	38	45	9	18	27	36	45	54
3	5	11	16	21	27	32	6	13	19	25	32	38	8	15	23	31	38	46	9	18	28	37	46	55

Chlorine Concentration (mg/L)	pH < = 8 Log Inactivations						pH = 8.5 Log Inactivations						pH = 9.0 Log Inactivations					
	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0	0.5	1.0	1.5	2.0	2.5	3.0
< = 0.4	8	17	25	33	42	50	10	20	30	39	49	59	12	23	35	47	58	70
0.6	9	17	26	34	43	51	10	20	31	41	51	61	12	24	37	49	61	73
0.8	9	18	27	35	44	53	11	21	32	42	53	63	13	25	38	50	63	75
1	9	18	27	36	45	54	11	22	33	43	54	65	13	26	39	52	65	78
1.2	9	18	28	37	46	55	11	22	34	45	56	67	13	27	40	53	67	80
1.4	10	19	29	38	48	57	12	23	35	46	58	69	14	27	41	55	68	82
1.6	10	19	29	39	48	58	12	23	35	47	58	70	14	28	42	56	70	84
1.8	10	20	30	40	50	60	12	24	36	48	60	72	14	29	43	57	72	86
2	10	20	31	41	51	61	12	25	37	49	62	74	15	29	44	59	73	88
2.2	10	21	31	41	52	62	13	25	38	50	63	75	15	30	45	60	75	90
2.4	11	21	32	42	53	63	13	26	39	51	64	77	15	31	46	61	77	92
2.6	11	22	33	43	54	65	13	26	39	52	65	78	16	31	47	63	78	94
2.8	11	22	33	44	55	66	13	27	40	53	67	80	16	32	48	64	80	96
3	11	22	34	45	56	67	14	27	41	54	68	81	16	32	49	65	81	97

*$CT_{99.9}$ = CT for 3 log inactivation.

Table C3.T17. CT Values for Inactivation of Viruses by Free Chlorine

Temperature (C)	**Log Inactivation 2.0 pH**		**Log Inactivation 3.0 pH**		**Log Inactivation 3.0 pH**	
	6-9	**10**	**6-9**	**10**	**6-9**	**10**
0.5	6	45	9	66	12	90
5	4	30	6	44	8	60
10	3	22	4	33	6	45
15	2	15	3	22	4	30
20	1	11	2	16	3	22
25	1	7	1	11	2	15

Table C3.T18. CT Values for Inactivation of Giardia Cysts by Chlorine Dioxide

Inactivation	**Temperature (C)**					
	<=1	**5**	**10**	**15**	**20**	**25**
0.5-log	10	4.3	4	3.2	2.5	2
1-log	21	8.7	7.7	6.3	5	3.7
1.5-log	32	13	12	10	7.5	5.5
2-log	42	17	15	13	10	7.3
2.5-log	52	22	19	16	13	9
3-log	63	26	23	19	15	11

Table C3.T19. CT Values for Inactivation of Viruses by Free Chlorine Dioxide pH 6-9

Removal	**Temperature (C)**					
	<=1	**5**	**10**	**15**	**20**	**25**
2-log	8.4	5.6	4.2	2.8	2.1	1.4
3-log	25.6	17.1	12.8	8.6	6.4	4.3
4-log	50.1	33.4	25.1	16.7	12.5	8.4

Table C3.T20. CT Values for Inactivation of Giardia Cysts by Ozone

Inactivation	Temperature (C)					
	<=1	**5**	**10**	**15**	**20**	**25**
0.5-log	0.48	0.32	0.23	0.16	0.12	0.08
1-log	0.97	0.63	0.48	0.32	0.24	0.16
1.5-log	1.5	0.95	0.72	0.48	0.36	0.24
2-log	1.9	1.3	0.95	0.63	0.48	0.32
2.5-log	2.4	1.6	1.2	0.79	0.60	0.40
3-log	2.9	1.9	1.43	0.95	0.72	0.48

Table C3.T21. CT Values for Inactivation of Viruses by Free Ozone

Inactivation	Temperature (C)					
	<=1	**5**	**10**	**15**	**20**	**25**
2-log	0.9	0.6	0.5	0.3	0.25	0.15
3-log	1.4	0.9	0.8	0.5	0.4	0.25
4-log	1.8	1.2	1.0	0.6	0.5	0.3

Table C3.T22. CT Values for Inactivation of Giardia Cysts by Chloramine pH 6-9

Inactivation	Temperature (C)					
	<=1	**5**	**10**	**15**	**20**	**25**
0.5-log	635	365	310	250	185	125
1-log	1,270	735	615	500	370	250
1.5-log	1,900	1,100	930	750	550	375
2-log	2,535	1,470	1,230	1,000	735	500
2.5-log	3,170	1,830	1,540	1,250	915	625
3-log	3,800	2,200	1,850	1,500	1,100	750

Table C3.T23. CT Values for Inactivation of Viruses by Chloramine

Inactivation	Temperature (C)					
	<=1	**5**	**10**	**15**	**20**	**25**
2-log	1,243	857	643	428	321	214
3-log	2,063	1,423	1,067	712	534	356
4-log	2,883	1,988	1,491	994	746	497

Table C3.T24. CT Values for Inactivation of Viruses by UV

Log Inactivation	
2.0	**3.0**
21	36

C4. CHAPTER 4

WASTEWATER

C4.1. SCOPE

This Chapter contains criteria to control and regulate discharges of wastewaters into surface waters. This includes, but is not limited to, storm water runoff associated with industrial activities, domestic and industrial wastewater discharges and pollutants from indirect dischargers.

C4.2. DEFINITIONS

C4.2.1. 7-day Average. The arithmetic mean of pollutant parameters values for samples collected in a period of seven consecutive days.

C4.2.2. 30-day Average. The arithmetic mean of pollutant parameters value for samples collected in a period of 30 consecutive days.

C4.2.3. Average Monthly Discharge Limitations. The highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

C4.2.4. Average Weekly Discharge Limitation. The highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

C4.2.5. Best Management Practices (BMPs). Practical practices and procedures that will minimize or eliminate the possibility of pollution being introduced into waters of the host nation.

C4.2.6. BOD_5. The five-day measure of the, dissolved oxygen used by microorganisms in the biochemical oxidation of organic matter. The pollutant parameter is biochemical oxygen demand (i.e., biodegradable organics in terms of oxygen demand).

C4.2.7. $CBOD_5$. The five-day measure of the pollutant parameter, carbonaceous

biochemical oxygen demand. This test can substitute for the BOD_5 testing, which suppresses the nitrification reaction/component in the BOD_5 test.

C4.2.8. Conventional Pollutants. Biochemical oxygen demand (BOD_5), total suspended solids (TSS), oil and grease, fecal coliforms and pH.

C4.2.9. Daily Discharge. The "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement (e.g., concentration) "daily discharge" is calculated as the average measurement of the pollutant over the day.

C4.2.10. Direct Discharge. Any "discharge of pollutants" other than an indirect discharge.

C4.2.11. Discharge of a Pollutant. Any addition of any pollutant or combination of pollutants to waters of host nation from any "point source."

C4.2.12. Domestic Wastewater Treatment System (DWTS). Any DoD or host-nation facility designed to treat wastewater before its discharge to waters of the host nation and in which the majority of such wastewater is made up of domestic sewage.

C4.2.13. Effluent Limitation. Any restriction imposed on quantities, discharge rates, and concentrations of pollutants that are ultimately discharged from point sources into waters of the host nation.

C4.2.14. Existing Source. A source that discharges pollutants that was in operation, or under construction, prior to October 1, 1994, unless it is subsequently substantially modified.

C4.2.15. Indirect Discharge. An introduction of pollutants in process wastewater to a domestic wastewater treatment system (DWTS).

C4.2.16. Industrial Activities Associated with Storm Water. Activities that during wet weather events may contribute pollutants to storm water runoff or drainage. (See Table C4.T3.)

C4.2.17. Industrial Wastewater Treatment System (IWTS). Any DoD facility

designed to treat process wastewater before its discharge to waters of the host nation other than a DWTS.

C4.2.18. Interference. Any addition of any pollutant or combination of pollutant discharges that inhibits or disrupts the DWTS, its treatment processes or operations, or its sludge handling processes, use or disposal.

C4.2.19. Maximum Daily Discharge Limitation. The highest allowable daily discharge based on volume as well as concentration.

C4.2.20. New Source. A source built or substantially modified on or after October 1, 1994, that directly or indirectly discharges pollutants to the wastewater system.

C4.2.21. Point Source. Any discernible, confined, and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, or rolling stock; but not including vessels, aircraft or any conveyance that merely collects natural surface flows of precipitation.

C4.2.22. Pollutant. Includes, but is not limited to, the following: dredged spoil; solid waste; incinerator residue; filter backwash; sewage; garbage; sewage sludge; munitions; chemical wastes; biological materials; radioactive materials; heat; wrecked or discarded equipment; rock; sand; cellar dirt; and industrial, municipal, and agricultural waste discharged into water.

C4.2.23. Process Wastewater. Any water which, during manufacturing or processing, comes into direct contact with, or results from the production or use of, any raw material, intermediate product, finished product, by-product, or waste product.

C4.2.24. Regulated Facilities. Those facilities for which criteria are established under this Chapter, such as DWTS, IWTS, or industrial discharges.

C4.2.25. Storm Water. Run-off and drainage from wet weather events such as rain, snow, ice, sleet or hail.

C4.2.26. Substantial Modification. Any modification to a facility, the cost of which exceeds $1,000,000, regardless of funding source.

C4.2.27. Total Suspended Solids (TSS). The pollutant parameter total filterable suspended solids.

C4.2.28. Total Toxic Organics (TTO). The summation of all quantifiable values greater than 0.01 mg/L for the toxic organics in Table C4.T1.

C4.2.29. Waters of the Host Nation. Surface waters including the territorial seas recognized under customary international law, including:

C4.2.29.1. All waters that are currently used, were used in the past, or may be susceptible to use in commerce.

C4.2.29.2. Waters that are or could be used for recreation or other purposes.

C4.2.29.3. Waters from which fish or shellfish are or could be taken and sold.

C4.2.29.4. Waters that are used or could be used for industrial purposes by industries.

C4.2.29.5. Waters including lakes, rivers, streams (including intermittent streams), sloughs, prairie potholes, or natural ponds.

C4.2.29.6. Tributaries of waters identified in paragraphs C4.2.29.1. through C4.2.29.5. of this definition.

NOTE: Domestic or industrial waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of this Chapter, are not waters of the host nation. This exclusion applies only to manmade bodies of water that were neither originally waters of the host nation nor resulted from impoundment of waters of the host nation.

C4.3. CRITERIA

C4.3.1. Effluent Limitations for Direct Dischargers of Conventional Pollutants

C4.3.1.1. All new sources of pollutants directly discharged to waters of host nations will comply with the following effluent limitations:

C4.3.1.1.1. BOD_5

C4.3.1.1.1.1. The 30-day average will not exceed 30 mg/L.

C4.3.1.1.1.2. The 7-day average will not exceed 45 mg/L.

C4.3.1.1.1.3. $CBOD_5$ may be substituted for BOD_5. In those cases the following limits will apply:

C4.3.1.1.1.3.1. The 30-day average will not exceed 25 mg/L.

C4.3.1.1.1.3.2. The 7-day average will not exceed 40 mg/L.

.

NOTE 1: Parameter $CBOD_5$ limit, if substituted for the parameter BOD_5, should be at least 5 mg/L less than each numerical limit for the 30-day and 7-day average for the BOD_5 limit. The $CBOD_5$ test procedure suppresses the nitrification component in the BOD_5 test procedure, thereby reducing the value or effects and lowering the oxygen demand.

C4.3.1.1.2. TSS

C4.3.1.1.2.1. The 30-day average will not exceed 30 mg/L.

C4.3.1.1.2.2. The 7-day average will not exceed 45 mg/L.

C4.3.1.1.2.3. pH. The effluent pH values will be maintained between 6.0 and 9.0.

C4.3.1.2. Existing sources of pollutants to waters of host nations will comply with the following effluent limitations:

C4.3.1.2.1. BOD_5

C4.3.1.2.1.1. The 30-day average will not exceed 45 mg/L.

C4.3.1.2.1.2. The 7-day average will not exceed 65 mg/L.

C4.3.1.2.2. TSS

C4.3.1.2.2.1. The 30-day average will not exceed 45 mg/L.

C4.3.1.2.2.2. The 7-day average will not exceed 65 mg/L.

C4.3.1.2.2.3. pH. The effluent pH values will be maintained between 6.0 and 9.0.

NOTE 2: If DWTS plant capacity is between 0.0 and 0.049 MGD, monthly sample must comply with level for 30-day average.

C4.3.1.3. Monitoring. Monitoring requirements apply to all regulated facilities. The monitoring frequency (including both sampling and analysis) given in Table C4.T2. includes all three parameters that are regulated (BOD_5, TSS and pH). Samples shall be collected at the point of discharge to the waters of the host nation.

C4.3.1.4. Recordkeeping Requirements. The following monitoring and recordkeeping requirements are BMPs and apply to all facilities. Retain records for 3 years.

C4.3.1.4.1. The effluent, concentration, or other measurement specified for each regulated parameter.

C4.3.1.4.2. The daily volume of effluent discharge from each point source.

C4.3.1.4.3. Test procedures for the analysis of pollutants.

C4.3.1.4.4. The date, exact place and time of sampling and/or measurements.

C4.3.1.4.5. The person who performed the sampling and/or measurements.

C4.3.1.4.6. The date of analysis.

C4.3.1.5. Complaint System. A system for investigating water pollution complaints from individuals or host-nation water pollution control authorities will be established, involving the Environmental Executive Agent, as appropriate.

C4.3.2. Effluent Limitations For Non-Categorical Industrial Indirect Dischargers

C4.3.2.1. Effluent Limits. The following effluent limits will apply to all discharges of pollutants to DWTSs and associated collection systems from process wastewater for which categorical standards have not been established (see following section for a list of categorical standards).

C4.3.2.1.1. Solid or Viscous Pollutants. The discharge of solid or viscous pollutants that would result in an obstruction to the domestic wastewater treatment plant flow is prohibited.

C4.3.2.1.2. Ignitability and Explosivity

C4.3.2.1.2.1. The discharge of wastewater with a closed cup flashpoint of less than 60°C (140°F) is prohibited.

C4.3.2.1.2.2. The discharge of wastes with any of the following characteristics is prohibited:

C4.3.2.1.2.2.1. A liquid solution that contains more than 24 percent alcohol by volume and has a flash point less than 60°C (140°F).

C4.3.2.1.2.2.2. A non-liquid that under standard temperature and pressure can cause a fire through friction.

C4.3.2.1.2.2.3. An ignitable compressed gas.

C4.3.2.1.2.2.4. An oxidizer, such as peroxide.

C4.3.2.1.3. Reactivity and Fume Toxicity. The discharge of any of the following wastes is prohibited:

C4.3.2.1.3.1. Wastes that are normally unstable and readily undergo violent changes without detonating;

C4.3.2.1.3.2. Wastes that react violently with water;

C4.3.2.1.3.3. Wastes that form explosive mixtures with water or form toxic gases or fumes when mixed with water;

C4.3.2.1.3.4. Cyanide or sulfide waste that can generate potentially harmful toxic fumes, gases, or vapors;

C4.3.2.1.3.5. Waste capable of detonation or explosive decomposition or reaction at standard temperature and pressure;

C4.3.2.1.3.6. Wastes that contain explosives regulated by Chapter 5; and

C4.3.2.1.3.7. Wastes that produce any toxic fumes, vapors, or gases with the potential to cause safety problems or harm to workers.

C4.3.2.1.4. Corrosivity. It is prohibited to discharge pollutants that have the potential to be structurally corrosive to the DWTS. In addition, no discharge of wastewater below a pH of 5.0 is allowed, unless the DWTS is specifically designed to handle this type of wastewater.

C4.3.2.1.5. Oil and Grease. The discharge of the following oils, which can pass through or cause interference to the DWTS, is prohibited: petroleum oil, non-biodegradable cutting oil, and products of mineral oil origin.

C4.3.2.1.6. Spills and Batch Discharges (slugs). Activities or installations that have a significant potential for spills or batch discharges will develop a slug prevention plan. Each plan must contain the following minimum requirements:

C4.3.2.1.6.1. Description of discharge practices, including non-routine batch discharges;

C4.3.2.1.6.2. Description of stored chemicals;

C4.3.2.1.6.3. Plan for immediately notifying the DWTS of slug discharges and discharges that would violate prohibitions under this section, including procedures for subsequent written notification within 5 days;

C4.3.2.1.6.4. Necessary practices to prevent accidental spills. This would include proper inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site runoff, and worker training;

C4.3.2.1.6.5. Proper procedures for building containment structures or equipment;

C4.3.2.1.6.6. Necessary measures to control toxic organic pollutants and solvents; and

C4.3.2.1.6.7. Proper procedures and equipment for emergency response, and any subsequent plans necessary to limit damage suffered by the treatment plant or the environment.

C4.3.2.1.7. Trucked and Hauled Waste. The discharge of trucked and hauled waste into the DWTS, except at locations specified by the DWTS operator, is prohibited.

C4.3.2.1.8. Heat in amounts that inhibit biological activity in the DWTS resulting in interference, but in no case in such quantities that the temperature of the process water at the DWTS exceeds 40°C (104°F).

C4.3.2.2. Complaint System. A system for investigating water pollution complaints from host-nation water pollution control authorities will be established involving the Environmental Executive Agent as appropriate.

C4.3.3. Effluent Limitations for Categorical Industrial Dischargers (Direct or Indirect)

C4.3.3.1. Any installations that have activities that fall into any of the industrial categories listed below must comply with the following effluent limitations (i.e., either direct- or indirect-discharge limitations at the source of the discharge). For most categories, the effluent limitations are the same for new and existing activities. Where differences in limitations exist, activities constructed or substantially modified on or after October 1, 1994 will meet the limitations for new activities.

C4.3.3.1.1. Electroplating. The following discharge standards apply to electroplating operations in which metal is electroplated on any basis material and to related metal finishing operations as set forth in the various subparts. These standards apply whether such operations are conducted in conjunction with electroplating, independently, or as part of some other operation. Electroplating subparts are identified as follows:

C4.3.3.1.1.1. Electroplating of Common Metals. Discharges of pollutants in process waters resulting from the process in which a material is electroplated with copper, nickel, chromium, zinc, tin, lead, cadmium, iron, aluminum, or any combination thereof.

C4.3.3.1.1.2. Electroplating of Precious Metals. Discharges of pollutants in process waters resulting from the process in which a material is plated with gold, silver, iridium, palladium, platinum, rhodium, ruthenium, or any combination thereof.

C4.3.3.1.1.3. Anodizing. Discharges of pollutants in process waters resulting from the anodizing of ferrous and nonferrous materials.

C4.3.3.1.1.4. Metal Coatings. Discharges of pollutants in process waters resulting from the chromating, phosphating, or immersion plating on ferrous and nonferrous materials.

C4.3.3.1.1.5. Chemical Etching and Milling. Discharges of pollutants in process waters resulting from the chemical milling or etching of ferrous and nonferrous materials.

C4.3.3.1.1.6. Electroless Plating. Discharges of pollutants in process waters resulting from the electroless plating of a metallic layer on a metallic or nonmetallic substrate.

C4.3.3.1.1.7. Printed Circuit Board Manufacturing. Discharges of pollutants in process waters resulting from the manufacture of printed circuit boards, including all manufacturing operations required or used to convert an insulating substrate to a finished printed circuit board.

C4.3.3.1.1.8. The following discharge standards apply to new and existing facilities in the above electroplating subparts which directly or indirectly discharge less than 38,000 liters per day (10,000 gallons per day):

Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)
Cyanide, amenable	5.0	2.7
Lead	0.6	0.4
Cadmium	1.2	0.7
Total Toxic Organics	4.57	--

C4.3.3.1.1.9. The following discharge standards apply to new and existing facilities in the above electroplating subparts that directly, or indirectly, discharge 38,000 liters per day (10,000 gallons per day) or more:

Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)
Cyanide, total	1.9	1.0
Copper	4.5	2.7
Nickel	4.1	2.6
Chrome	7.0	4.0
Zinc	4.2	2.6
Lead	0.6	0.4
Cadmium	1.2	0.7
Total Metals	0.5	6.8
Total Toxic Organics	2.13	--

C4.3.3.1.1.10. In addition to the above standards, new and existing facilities that electroplate precious metals and that directly or indirectly discharge 38,000 liters per day (10,000 gallons per day) or more must comply with the following standard:

Pollutant	Daily Maximum (mg/L)	4-day Average (mg/L)
Silver	1.2	0.7

C4.3.3.1.2. Monitoring. Monitoring of categorical industrial dischargers (including both sampling and analysis) will be accomplished quarterly and will include all parameters that are specified in the section of this Chapter dealing with industrial dischargers. Samples should be collected at the point of discharge prior to any mixing with the receiving water. Sampling for total toxic organics (TTO) may not be required if the commanding officer determines that no discharge of concentrated toxic organics into the wastewaters has occurred and the facility has implemented a TTO management plan. (See Table C4.T2., "Monitoring Requirements.")

C4.3.4. Storm Water Management

C4.3.4.1. Develop and implement storm water pollution prevention (P2) plans for activities listed in Table C4.T3. Update the SWPPP annually using in-house resources.

C4.3.4.2. Employee Training. Personnel who handle hazardous substances or perform activities that could contribute pollution to wet weather events should be trained in appropriate Best Management Practices. Such training should stress P2 principles and awareness of possible pollution sources including non-traditional sources such as sediment, nitrates, pesticides and fertilizers.

C4.3.5. Septic System. Discharge to a septic system of wastewater containing industrial pollutants in levels that will inhibit biological activity is prohibited. Known discharges of industrial pollutants to existing septic systems shall be eliminated and appropriate actions should be taken to eliminate contamination. Siting of such systems is addressed in Chapter 3, "Drinking Water."

C4.3.6. Sludge Disposal. All sludges produced during the treatment of wastewater will be disposed of under Chapter 6, "Hazardous Waste," or Chapter 7, "Solid Waste," as appropriate.

Table C4.T1. Components of Total Toxic Organics

Volatile Organics	
Acrolein (Propenyl)	Bromodichloromethane
Acrylonitrile	1,1,2,2-Tetrachloroethane
Methyl chloride (chloromethane)	1,2-Dichloropropane
Methyl bromide (bromomethane)	1,3-Dichloropropylene (1,3-Dichloropropene)
Vinyl Chloride (chloroethylene)	Trichloroethene
Chloroethane	Dibromochloromethane
Methylene Chloride (9 dichloromethane)	1,1,2-Trichloroethane
1,1-Dichloroethene	Benzene
1,1-Dichloroethane	2-Chloroethyl vinyl ether (mixed)
1,2-Dichloroethane	Bromoform (tribromomethane)
1,2-trans-Dichloroethene	Tetrachloroethene
Chloroform (trichloromethane)	Toluene
1,1,1-Trichloroethane	Chlorobenzene
Carbon Tetrachloride (tetrachloromethane)	Ethylbenzene
Base/Neutral Extractable Organics	
N-nitrosodimethylamine	Diethyl phthalate
bis (2-chloroethyl) ether	1,2-Diphenylhydrazine
1,3-Dichlorobenzene	N-nitrosodiphenylamine
1,4-Dichlorobenzene	4-Bromophenyl phenyl ether
1,2-Dichlorobenzene	Hexachlorobenzene
bis(2-chloroisopropyl)-ether	Phenanthrene
Hexachloroethane	Anthracene
N-nitrosodi-n-propylamine	Di-n-butyl phthalate
Nitrobenzene	Fluoranthene
Isophorone	Pyrene
bis (2-chloroethoxy) methane	Benzidine
1,2,4-trichlorobenzene	Butyl benzyl phthalate
Naphthalene	1,2-benzoanthracene (benzo (a) anthracene)
Hexachlorobutadiene	Chrysene
Hexachlorocyclopentadiene	3,3-Dichlorobenzidine
2-Chloronaphthalene	bis (2-ethylhexyl) phthalate
Acenaphthylene	Di-n-octyl phthalate
Dimethyl Phthalate	3,4-Benzofluoranthene (benzo (b) fluoranthene)
2,6-Dinitrotoluene	11,12-Benzofluoranthene (benzo (k) fluoranthene)
Acenaphthene	Benzo (a) pyrene (3,4-benzopyrene)
2,4-Dinitrotoluene	Indeno (1,2,3-cd) pyrene (2,3-o-phenylene pyrene)
Fluorene	1,2,5,6-Dibenzanthracene (dibenezo (a,h) anthracene)
4-Chlorophenyl phenyl ether	1,12-Benzoperylene (benzo (g,h,i) perylene)

Table C4.T1. Components of Total Toxic Organics--Continued

Acid Extractables Organics Volatile Organics	
2-Chlorophenol	2,4,6-Trichlorphenol
Phenol	2,4-Dinitrophenol
2-Nitrophenol	4-Nitrophenol
2,4-Dimethylphenol	p-Chloro-m-cresol
2,4-Dichlorophenol	Pentachlorophenol
4,6-Dinitro-o-cresol	
Pesticides/PCBs	
Alpha-Endosulfan	Endrin
Beta-Endosulfan	Endrin aldehyde
Endosulfan sulfate	Heptachlor
Alpha-BHC	Heptachlor Epoxide (BHC-hexachlorocyclohexane)
Beta-BHC	Toxaphene
Delta-BHC	PCB-1242 (Arochlor 1242)
Gamma-BHC	PCB-1254 (Arochlor 1254)
4,4-DDT	PCB-1221 (Arochlor 1221)
4,4-DDE (p,p-DDX)	PCB-1232 (Arochlor 1232)
(p,p-TDE)	PCB-1248 (Arochlor 1248)
Aldrin	PCB-1260 (Arochlor 1260)
Chlordane (technical mixture and metabolites)	PCB-1016 (Arochlor 1016)
Dieldrin	

Table C4.T2. Monitoring Requirements

Plant Capacity (MGD)	**Monitoring Frequency**
0.001 - 0.99	Monthly
1.0 - 4.99	Weekly
> 5.0	Daily

Table C4.T3. Best Management Practices

Activity	Best Management Practice
Aircraft Ground Support Equipment Maintenance	Perform maintenance/repair activities inside Use drip pans to capture drained fluids Cap hoses to prevent drips and spills
Aircraft/runway deicing	Perform anti-icing before the storm Put critical aircraft in hangars/shelters
Aircraft/vehicle fueling operations	Protect fueling areas from the rain Provide spill response equipment at fueling station
Aircraft/vehicle maintenance & repair	Perform maintenance/repair activities inside Use drip pans to capture drained fluids
Aircraft/vehicle washing	Capture wash water and send to wastewater treatment plant Treat wash water with oil water separator before discharge
Bulk fuel storage areas	Use dry camlock connectors to reduce fuel loss Capture spills with drip pans when breaking connections Curb fuel transfer areas, treat with oil water separator
Construction activities	Construct sediment dams/silt fences around construction sites
Corrosion control activities	Capture solvent/soaps used to prepare aircraft for painting Perform corrosion control activities inside
Hazardous material storage	Store hazardous materials inside or under cover Reduce use of hazardous materials
Outdoor material storage areas	Cover and curb salt, coal, urea piles Store product drums inside or under cover Reduce quantity of material stored outside
Outdoor painting/depainting operations	Capture sandblasting media for proper disposal Capture paint clean up materials (thinners, rinsates)
Pesticide operations	Capture rinse water when mixing chemicals Store spray equipment inside
Power production	Capture leaks and spills from power production equipment using drip pans, etc.
Vehicle storage yards	Check vehicles in storage for leaks and spills Use drip pans to capture leaking fluids

C5. CHAPTER 5

HAZARDOUS MATERIAL

C5.1. SCOPE

This Chapter contains criteria for the storage, handling, and disposition of hazardous materials. It does not cover solid or hazardous waste, underground storage tanks, petroleum storage, and related spill contingency and emergency response requirements. These matters are covered under other Chapters. This Guide does not cover munitions.

C5.2. DEFINITIONS

C5.2.1. Hazardous Chemical Warning Label. A label, tag, or marking on a container that provides the following information:

C5.2.1.1. Identification/name of hazardous chemicals;

C5.2.1.2. Appropriate hazard warnings; and

C5.2.1.3. The name and address of the manufacturer, importer or other responsible party; and that is prepared in accordance with DoD 6050.5-H (reference (h)).

C5.2.2. Hazardous Material. Any material that is capable of posing an unreasonable risk to health, safety, or environment if improperly handled, stored, issued, transported, labeled, or disposed because it displays a characteristic listed in Table C5.T1., "Typical Hazardous Materials Characteristics," or the material is listed in Table AP1.T4. Munitions are excluded.

C5.2.3. Hazardous Material Information System (HMIS). The computer-based information system developed to accumulate, maintain and disseminate important information on hazardous material used by DoD. The HMIS has been assigned Report Control Symbol DD-A&T(AR)1486 in accordance with DoD 8910-M (reference (f)).

C5.2.4. Hazardous Material Shipment. Any movement of hazardous material in a DoD land vehicle either from an installation to a final destination off the installation, or from a point of origin off the installation to a final destination on the installation, in excess of any of the following quantities:

C5.2.4.1. For hazardous material identified as a result of inclusion in Table AP1.T4. any quantity in excess of the reportable quantity listed in Table AP1.T4.;

C5.2.4.2. For other liquid or semi-liquid hazardous material, in excess of 410 liters (110 gallons);

C5.2.4.3. For other solid hazardous material, in excess of 225 Kg (500 pounds); or

C5.2.4.4. For combinations of liquid, semi-liquid and solid hazardous materials, in excess of 340 Kg (750 pounds).

C5.2.5. Material Safety Data Sheet (MSDS). A form used by manufacturers of chemical products to communicate to users the chemical, physical, and hazardous properties of their product.

C5.3. CRITERIA

C5.3.1. Storage and handling of hazardous materials will adhere to DoD Component policies, including Joint Service Publication on Storage and Handling of Hazardous Materials. DLAI 4145.11, TM 38-410, NAVSUP PUB 573, AFJMAN 23-209, and MCO 4450.12A (reference (i)) provide additional guidance on the storage and handling of hazardous materials. The International Maritime Dangerous Goods (IMDG) Code and appropriate DoD and Component instructions provide requirements for international maritime transport of hazardous materials originating from DoD installations. International air shipments of hazardous materials originating from DoD installations are subject to International Civil Air Organization Rules or DoD Component guidance, including AFJM 24-204, TM 38-250, NAVSUP 505, MCO P4030.19E, and DLAM 4145.3 (reference (j)).

C5.3.2. Hazardous material dispensing areas will be properly maintained. Drums/containers must not be leaking. Drip pans/absorbent materials will be placed under containers as necessary to collect drips or spills. Container contents will be clearly marked. Dispensing areas will be located away from catch basins and storm drains.

C5.3.3. Installations will ensure that for each hazardous material shipment:

C5.3.3.1. The shipment is accompanied throughout by shipping papers that clearly describe the quantity and identity of the material and that include an MSDS;

C5.3.3.2. All drivers are briefed on the hazardous material included in the shipment, including health risks of exposure and the physical hazards of the material including potential for fire, explosion and reactivity;

C5.3.3.3. Drivers will be trained on spill control and emergency notification procedures.

C5.3.3.4. For any hazardous material categorized on the basis of section AP1.1., the shipping papers and briefing for the driver include identification of the material as "Ignitable," "Corrosive," "Reactive," or "Toxic;"

C5.3.3.5. The vehicles are subjected to a walk-around inspection by supervisory personnel before and after the material is loaded; and

C5.3.3.6. Packages are labeled in accordance with subsection C5.3.7., below.

C5.3.4. Each installation will maintain a master listing of all storage locations for hazardous material and an inventory of all hazardous materials contained therein (see subsection C18.3.2., below).

C5.3.5. Material Safety Data Sheets. Each material safety data sheet shall be in English or the predominant language in the work place, and shall contain at least the following information:

C5.3.5.1. The identity used on the label

C5.3.5.1.1. If the hazardous chemical is a single substance, its' chemical and common name, and its' Chemical Abstract Service (CAS) Number.

C5.3.5.1.2. If the hazardous chemical is a mixture that has been tested as a whole to determine its' hazards, the chemical and common name(s) of the ingredients that contribute to these known hazards, and the common name(s) of the mixture itself; or

C5.3.5.1.3. If the hazardous chemical is a mixture that has not been tested as a whole:

C5.3.5.1.3.1. The chemical and common name(s) of all ingredients

which have been determined to be health hazards, and which comprise 1 percent or greater of the composition, except that chemicals identified as carcinogens shall be listed if the concentrations are 0.1 percent or greater;

C5.3.5.1.3.2. The chemical and common name(s) of all ingredients that have been determined to be health hazards, and that comprise less than 1 percent (0.1 percent for carcinogens) of the mixture, if there is evidence that the ingredient(s) could be released from the mixture in concentrations which would exceed an established OSHA permissible exposure limit, or could present a health hazard to employees; and

C5.3.5.1.3.3. The chemical and common name(s) of all ingredients that have been determined to present a physical hazard when present in the mixture.

C5.3.5.2. Physical and chemical characteristics of the hazardous chemical (such as vapor pressure, flash point);

C5.3.5.3. The physical hazards of the hazardous chemical, including the potential for fire, explosion, and reactivity;

C5.3.5.4. The health hazards of the hazardous chemical, including signs and symptoms of exposure, and any medical conditions that are generally recognized as being aggravated by exposure to the chemical;

C5.3.5.5. The primary route(s) of entry (inhalation, skin absorption, ingestion, etc.);

C5.3.5.6. The appropriate occupational exposure limit recommended by the chemical manufacturer, importer, or employer preparing the material safety data sheet, where available;

C5.3.5.7. Whether the hazardous chemical has been found to be a potential carcinogen;

C5.3.5.8. Any generally applicable precautions for safe handling and use that are known to the chemical manufacturer, importer or employer preparing the material safety data sheet, including appropriate hygienic practices, protective measures during repair and maintenance of contaminated equipment, and procedures for clean-up of spills and leaks;

C5.3.5.9. Any generally applicable control measures that are known to the

chemical manufacturer, importer or employer preparing the material safety data sheet, such as appropriate engineering controls, work practices, or personal protective equipment;

C5.3.5.10. Emergency and first aid procedures;

C5.3.5.11. The date of preparation of the material safety data sheet or the last change to it; and

C5.3.5.12. The name, address and telephone number of the chemical manufacturer, importer, employer or other responsible party preparing or distributing the material safety data sheet, who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.

C5.3.6. Each work center will maintain a file of Material Safety Data Sheets (MSDS) for each hazardous material procured, stored or used at the work center. MSDSs that are not contained in the HMIS and those MSDSs prepared for locally purchased items should be incorporated into HMIS. A file of MSDS information not contained in HMIS should be maintained on site.

C5.3.7. All hazardous materials on DoD installations will have a Hazardous Chemical Warning Label in accordance with DoD 6050.5-H (reference (h)) and have MSDS information either available or in HMIS in accordance with DoD Directive 6050.1 (reference (k)) and other Component instructions. These requirements apply throughout the life cycle of these materials.

C5.3.8. DoD installations will reduce the use of hazardous materials where practical through resource recovery, recycling, source reduction, acquisition, or other minimization strategies in accordance with Service guidance on improved hazardous material management processes and techniques.

C5.3.9. All excess hazardous material will be processed through the Defense Reutilization and Marketing Service (DRMS) in accordance with the procedures in DoD 4160.21-M (reference (l)). DRMS will only donate, transfer, or sell hazardous material to environmentally responsible parties. This subsection is not intended to prohibit the transfer of usable HM between DoD activities participating in a regional or local pharmacy or exchange program.

C5.3.10. All personnel who use, handle or store hazardous materials will be trained in accordance with reference (k), and other Component instructions.

C5.3.11. The installation must prevent the unauthorized entry of persons or livestock into the hazardous materials storage area.

C5.T1. Typical Hazardous Materials Characteristics

1. The item is a health or physical hazard. Health hazards include carcinogens, corrosive materials, irritants, sensitizers, toxic materials, and materials that damage the skin, eyes, or internal organs. Physical hazards include combustible liquids, compressed gasses, explosives, flammable materials, organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials and water-reactive materials.
2. The item and/or its disposal is regulated by the host nation because of its hazardous nature.
3. The item contains asbestos, mercury, or polychlorinated biphenyls.
4. The item has a flashpoint below 93° C (200° F) closed cup, or is subject to spontaneous heating or is subject to polymerization with release of large amounts of energy when handled, stored, and shipped without adequate control.
5. The item is a flammable solid or is an oxidizer or is a strong oxidizing or reducing agent with a standard reduction potential of greater than 1.0 volt or less than -1.0 volt.
6. In the course of normal operations, accidents, leaks, or spills, the item may produce dusts, gases, fumes, vapors, mists, or smokes with one or more of the above characteristics.
7. The item has special characteristics, which in the opinion of the manufacturer or the DoD Components, could cause harm to personnel if used or stored improperly.

C6. CHAPTER 6

HAZARDOUS WASTE

C6.1. SCOPE

This Chapter contains criteria for a comprehensive management program to ensure that hazardous waste is identified, stored, transported, treated, disposed and recycled in an environmentally sound manner.

C6.2. DEFINITIONS

C6.2.1. Acute Hazardous Waste. Those wastes listed in Table AP1.T4. with a U.S. EPA waste number with the "P" designator, or those hazardous wastes in Table AP1.T4. with Hazard Code (H).

C6.2.2. Disposal. The discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous waste into, or on any land or water so that the waste or constituent thereof may enter the environment. Proper disposal effectively mitigates hazards to human health and the environment.

C6.2.3. DoD Hazardous Waste Generator. In DoD, a generator is considered to be the installation, or activity on an installation, that produces a hazardous waste.

C6.2.4. Hazardous Constituent. A chemical compound that is listed by name in Table AP1.T4. or possesses the characteristics described in section AP1.1.

C6.2.5. Hazardous Waste. A discarded material that may be solid, semi-solid, liquid, or contained gas and either exhibits a characteristic of a hazardous waste defined in section AP1.1. or is listed as a hazardous waste in Tables AP1.T1. through AP1.T4. Excluded from this definition are domestic sewage sludge, household wastes and medical wastes.

C6.2.6. Hazardous Waste Accumulation Point (HWAP). A shop, site, or other work center where hazardous wastes are accumulated until removed to a Hazardous Waste Storage Area (HWSA) or shipped for treatment or disposal. A HWAP may be used to accumulate no more than 208 liters (55 gallons) of hazardous waste, or one liter (one quart) of acute hazardous waste, from each waste stream. The HWAP must be at or near the point of generation and under the control of the operator.

C6.2.7. Hazardous Waste Fuel. Hazardous wastes burned for energy recovery. Fuel produced from hazardous waste by processing, blending or other treatment is also hazardous waste fuel.

C6.2.8. Hazardous Waste Generation. Any act or process that produces hazardous waste (HW) as defined in this Guide.

C6.2.9. Hazardous Waste Profile Sheet (HWPS). A document that identifies and characterizes the waste by providing user's knowledge of the waste, and/or lab analysis, and details the physical, chemical, and other descriptive properties or processes that created the hazardous waste.

C6.2.10. Hazardous Waste Storage Area (HWSA). One or more locations on a DoD installation where HW is collected prior to shipment for treatment or disposal. A HWSA may store more than 55 gallons of a HW stream and more than one quart of an acute HW stream.

C6.2.11. Hazardous Waste Storage Area Manager. A person, or agency, on the installation assigned the operational responsibility for receiving, storing, inspecting, and general management of the installation's HWSA or HWSA program.

C6.2.12. Land Disposal. Placement in or on the land, including, but not limited to, land treatment, facilities, surface impoundments, underground injection wells, salt dome formations, salt bed formations, underground mines or caves.

C6.2.13. Treatment. Any method, technique, or process, excluding elementary neutralization, designed to change the physical, chemical, or biological characteristics or composition of any hazardous waste so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

C6.2.14. Unique Identification Number. A number assigned to generators of hazardous waste to identify the generator and used to assist in tracking the waste from point of generation to ultimate disposal. The number could be the Unit Identification Code (UIC) or the DoDAAC; executive agent should specify the method for determining the unique identification number in the final governing standards.

C6.2.15. Used Oil Burned for Energy Recovery. Used oil that is burned for energy recovery is termed "used oil fuel." Used oil fuel includes any fuel produced from used oil by processing, blending or other treatment. "Used oil," means any oil or

other waste POL product that has been refined from crude oil, or is synthetic oil, has been used, and as a result of such use, is contaminated by physical or chemical impurities. Although used oil may exhibit the characteristics of reactivity, toxicity, ignitability, or corrosivity, it is still considered used oil, unless it has been mixed with hazardous waste. Used oil mixed with hazardous waste is a hazardous waste and will be managed as such.

C6.2.16. Hazardous Waste Log. A listing of HW deposited and removed from a HWSA. Information such as the waste type, volume, location and storage removal dates should be recorded.

C6.2.17. Elementary Neutralization. A process of neutralizing a HW, which is hazardous only because of the corrosivity characteristic. It must be accomplished in a tank, transport vehicle, or container.

C6.3. CRITERIA

C6.3.1. DoD Hazardous Waste Generators

C6.3.1.1. Hazardous Waste Determination and Characterization. Generators will identify and characterize the wastes generated at their site using their knowledge of the materials and processes that generated the waste or through laboratory analysis of the waste. Generators will identify inherent hazardous characteristics associated with a waste in terms of physical properties (e.g., solid, liquid, contained gases), chemical properties (e.g., chemical constituents, technical or chemical name) and/or other descriptive properties (e.g., ignitable, corrosive, reactive, toxic). The properties defining the characteristics should be measurable by standardized, and available testing protocols.

C6.3.1.2. A Hazardous Waste Profile Sheet (HWPS) will be used to identify each hazardous waste stream. The HWPS must be updated by the generator, as necessary, to reflect any new waste streams or process modifications that change the character of the hazardous waste being handled at the storage area.

C6.3.1.3. Each generator will use a unique identification number for all recordkeeping, reports and manifests for hazardous waste.

C6.3.1.4. Pre-Transport Requirements

C6.3.1.4.1. Transportation

C6.3.1.4.1.1. When transporting hazardous waste via commercial transportation on host-nation public roads and highways, hazardous waste generators will prepare off-installation hazardous waste shipments in compliance with applicable host-nation transportation regulations. Requirements may include placarding, marking, containerization, and labeling. Hazardous waste designated for international transport will be prepared in accordance with applicable international regulations. In the absence of host-nation regulations, international standards will be used.

C6.3.1.4.1.2. When transporting hazardous waste via military vehicle on host-nation public roads and highways, generators will ensure compliance with Service regulations for the transport of hazardous materials and, if required by applicable international agreement (i.e., SOFA, basing, etc.), host-nation transportation regulations.

C6.3.1.4.2. Manifesting. All hazardous waste leaving the installation will be accompanied by a manifest to ensure a complete audit trail from point of origin to ultimate disposal. The manifest will include the information listed below. Host-nation forms will be used when applicable; otherwise, DD Form 1348-1A, Issue Release/Receipt Document, or DD Form 1348-2, Issue Release/Receipt Document with Address Label, may be used. This manifest should include:

C6.3.1.4.2.1. Generator's name, address, and telephone number;

C6.3.1.4.2.2. Generator's unique identification number;

C6.3.1.4.2.3. Transporter's name, address, and telephone number;

C6.3.1.4.2.4. Destination name, address, and telephone number;

C6.3.1.4.2.5. Description of waste;

C6.3.1.4.2.6. Total quantity of waste;

C6.3.1.4.2.7. Date of shipment; and

C6.3.1.4.2.8. Date of receipt.

C6.3.1.4.3. Generators will maintain an audit trail of hazardous waste from the point of generation to disposal. Generators using DRMS disposal services will obtain a signed copy of the manifest from the initial DRMS recipient of the waste, at which time DRMS assumes responsibility. A generator, as provided in a

host-tenant agreement, that uses the hazardous waste management and/or disposal program of a DoD Component that has a different unique identification number (see definition C6.2.14., above), will obtain a signed copy of the manifest from the receiving Component, at which time the receiving Component will assume responsibility for subsequent storage, transfer and disposal of the waste. Activities desiring to dispose of their waste outside of the DRMS system will develop their own manifest tracking system to provide an audit trail from point of generation to ultimate disposal.

C6.3.2. Hazardous Waste Accumulation Points (HWAP)

C6.3.2.1. A HWAP is defined in subsection C6.2.6.,, above. Each HWAP must be designed and operated to provide appropriate segregation for different waste streams, including those which are chemically incompatible. Each HWAP will have warning signs (National Fire Protection Association or appropriate international sign) appropriate for the waste being accumulated at that site.

C6.3.2.2. A hazardous waste accumulation point will comply with the storage limits in subsection C6.2.6., above. When these limits have been reached, the generator will make arrangements within 5-working days to move the hazardous waste to a HWSA or ship it off-site for treatment or disposal. Arrangements must include submission of all appropriate turn-in documents to initiate the removal (e.g., DD Form 1348-1A) to appropriate authorities responsible for removing the HW (e.g., DRMO).

C6.3.2.3. All criteria of subsection C6.3.4., "Use and Management of Containers," apply to HWAPs with the exception of subparagraph C6.3.4.1.5. "Weekly Inspections."

C6.3.2.4. The following provisions of subsection C6.3.5., "Recordkeeping Requirements," apply to HWAPs: paragraphs C6.3.5.1. "Turn-in Documents," C6.3.5.5. "Manifests," and C6.3.5.6. "Waste Characterization."

C6.3.2.5. Personnel Training. Personnel assigned HWAP duty must successfully complete appropriate hazardous waste training necessary to perform their assigned duties. At a minimum, this must include pertinent waste handling and emergency response procedures. Generic HW training requirements are described in subsection C6.3.9. of this Chapter.

C6.3.3. Hazardous Waste Storage Areas (HWSA)

C6.3.3.1. Location Standards. To the maximum extent possible, all HWSA

will be located to minimize the risk of release due to seismic activity, floods, or other natural events. For facilities located where they may face such risks, the installation spill prevention and control plan must address the risk.

C6.3.3.2. Design and Operation of HWSA. HWSAs must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of hazardous waste or hazardous waste constituents to air, soil, groundwater or surface water that could threaten human health or the environment. Hazardous waste should not be stored longer than 1 year in a HWSA.

C6.3.3.3. Waste Analysis and Verification

C6.3.3.3.1. Waste Analysis Plan. The HWSA manager, in conjunction with the installation(s) served, will develop a plan to determine how and when wastes are to be analyzed. The waste analysis plan will include procedures for characterization and verification testing of both on-site and off-site hazardous waste. The plan should include: parameters for testing and rationale for choosing them, frequency of analysis, test methods, and sampling methods.

C6.3.3.3.2. Maintenance of Waste Analysis File. The HWSA must have, and keep on file, a hazardous waste profile sheet (HWPS) for each waste stream that is stored at each HWSA.

C6.3.3.3.3. Waste Verification. Generating activities will provide identification of incoming waste on the HWPS to the HWSA manager. Prior to accepting the waste, the HWSA manager will:

C6.3.3.3.3.1. Inspect the waste to ensure it matches the description provided;

C6.3.3.3.3.2. Ensure that no waste is accepted for storage unless a HWPS is provided, or available and properly referenced;

C6.3.3.3.3.3. Request a new HWPS from the generator if there is reason to believe that the process generating the waste has changed;

C6.3.3.3.3.4. Analyze waste shipments in accordance with the waste analysis plan to determine whether it matches the waste description on the accompanying manifest and documents; and

C6.3.3.3.3.5. Reject shipments that do not match the accompanying waste descriptions unless the generator provides an accurate description.

C6.3.3.4. Security

C6.3.3.4.1. General. The installation must prevent the unknowing entry, and minimize the possibility for unauthorized entry, of persons or livestock onto the hazardous waste storage area grounds.

C6.3.3.4.2. Security System Design. An acceptable security system for a hazardous waste storage area consists of either:

C6.3.3.4.2.1. A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or other designated personnel) that continuously monitors and controls entry into the hazardous waste storage area; or

C6.3.3.4.2.2. An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff) that completely surrounds the hazardous waste storage area, combined with a means to control entrance at all times (e.g., an attendant, television monitors, locked gate, or controlled roadway access).

C6.3.3.4.3. Required Signs. A sign with the legend "Danger Unauthorized Personnel Keep Out," must be posted at each entrance to the hazardous waste storage area, and at other locations, in sufficient numbers to be seen from any approach to the hazardous waste storage area. The legend must be written in English and in any other language predominant in the area surrounding the installation, and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger Unauthorized Personnel Keep Out," may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the hazardous waste storage area, and entry to it can be dangerous.

C6.3.3.5. Required Aisle Space. Aisle space must allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency. Containers must not obstruct an exit.

C6.3.3.6. Access to Communications or Alarm System

C6.3.3.6.1. General. Whenever hazardous waste is being poured, mixed, or otherwise handled, all personnel involved in the operation must have

immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another person.

C6.3.3.6.2. If there is only one person on duty at the HWSA premises, that person must have immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio, capable of summoning external emergency assistance.

C6.3.3.7. Required Equipment. All HWSAs must be equipped with the following:

C6.3.3.7.1. An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to HWSA personnel.

C6.3.3.7.2. A device, such as an intrinsically safe telephone (immediately available at the scene of operations) or a hand-held two-way radio, capable of summoning emergency assistance from installation security, fire departments, or emergency response teams.

C6.3.3.7.3. Portable fire extinguishers, fire control equipment appropriate to the material in storage (including special extinguishing equipment as needed, such as that using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment.

C6.3.3.7.4. Water at adequate volume and pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems.

C6.3.3.7.5. Readily available personal protective equipment appropriate to the materials stored, eyewash and shower facilities.

C6.3.3.7.6. Testing and Maintenance of Equipment. All HWSA communications alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be maintained to ensure its proper operation in time of emergency.

C6.3.3.8. General Inspection Requirements

C6.3.3.8.1. General. The installation must inspect the HWSA for malfunctions and deterioration, operator errors, and discharges that may be causing, or may lead to, a release of hazardous waste constituents to the environment or threat to human health. The inspections must be conducted often enough to identify problems

in time to correct them before they harm human health or the environment.

C6.3.3.8.2. Types of Equipment Covered. Inspections must include all equipment and areas involved in storage and handling of hazardous waste, including all containers and container storage areas, tank systems and associated piping, and all monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards.

C6.3.3.8.3. Inspection Schedule. Inspections must be conducted according to a written schedule that is kept at the HWSA. The schedule must identify the types of problems (e.g., malfunctions or deterioration) that are to be looked for during the inspection (e.g., inoperative sump pump, leaking fitting, eroding dike, etc.).

C6.3.3.8.4. Frequency of Inspections. Minimum frequencies for inspecting containers and container storage areas are found in subparagraph C6.3.4.1.5., below. Minimum frequencies for inspecting tank systems are found in subparagraph C6.3.7.5.2., below. For equipment not covered by those sections, inspection frequency should be based on the rate of possible deterioration of the equipment and probability of an environmental or human health incident if the deterioration or malfunction or any operator error goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, must be inspected daily when in use.

C6.3.3.8.5. Remedy of Problems Revealed by Inspection. The installation must remedy any deterioration or malfunction of equipment or structures that the inspection reveals on a schedule, which ensures that the problem does not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, action must be taken immediately.

C6.3.3.8.6. Maintenance of Inspection Records. The installation must record inspections in an inspection log or summary, and keep these records for at least 3 years from the date of inspection. At a minimum, these records must include the date and time of inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions.

C6.3.3.9. Personnel Training. Personnel assigned HWSA duty must successfully complete an appropriate hazardous waste training program in accordance with the training requirements in subsection C6.3.9. of this Chapter.

C6.3.3.10. Storage Practices

C6.3.3.10.1. Compatible Storage. The storage of ignitable, reactive, or incompatible wastes must be handled so that it does not threaten human health or the environment. Dangers resulting from improper storage of incompatible wastes include generation of extreme heat, fire, explosion and generation of toxic gases.

C6.3.3.10.2. General Requirements For Ignitable, Reactive, or Incompatible Wastes. The HWSA manager must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat-producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the HWSA personnel must confine smoking and open flame to specially designated locations. "No smoking" signs, or appropriate icon, must be conspicuously placed wherever there is a hazard from ignitable or reactive waste. In areas where access by non-English speaking persons is expected, the "no smoking" legend must be written in English and in any other language predominant in the area. Water reactive waste cannot be stored in the same area as flammable and combustible liquid.

C6.3.3.11. Closure and Closure Plans

C6.3.3.11.1. Closure. At closure of a HWSA, hazardous waste and hazardous waste residues must be removed from the containment system including remaining containers, liners, and bases. Closure should be done in a manner that eliminates or minimizes the need for future maintenance or the potential for future releases of hazardous waste and according to the Closure Plan.

C6.3.3.11.2. Closure Plan. Closure plans will be developed before a new HWSA is opened. Each existing HWSA also will develop a closure plan. Concurrent with the decision to close the HWSA the plan will be implemented. The closure plan will include: estimates of the storage capacity of hazardous waste, steps to be taken to remove or decontaminate all waste residues, and estimate of the expected date for closure.

C6.3.4. Use and Management of Containers

C6.3.4.1. Container Handling and Storage. To protect human health and the environment, the following guidelines will apply when handling and storing hazardous waste containers:

C6.3.4.1.1. Containers holding hazardous waste will be in good condition, free from severe rusting, bulging or structural defects.

C6.3.4.1.2. Containers used to store hazardous waste, including overpack containers, must be compatible with the materials stored.

C6.3.4.1.3. Management of Containers

C6.3.4.1.3.1. A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

C6.3.4.1.3.2. A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

C6.3.4.1.3.3. Containers of flammable liquids must be grounded when transferring flammable liquids from one container to the other.

C6.3.4.1.4. Containers holding hazardous waste will be marked with a hazardous waste marking, and a label indicating the hazard class of the waste contained (i.e., flammable, corrosive, etc.).

C6.3.4.1.5. Areas where containers are stored must be inspected weekly for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors. Secondary containment systems will be inspected for defects and emptied of accumulated releases or retained storm water.

C6.3.4.2. Containment. Container storage areas must have a secondary containment system meeting the following:

C6.3.4.2.1. Must be sufficiently impervious to contain leaks, spills and accumulated precipitation until the collected material is detected and removed; and

C6.3.4.2.2. The secondary containment system must have sufficient capacity to contain 10 percent of the volume of stored containers or the volume of the largest container, whichever is greater.

C6.3.4.2.3. Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system as described in subparagraph C6.3.4.2.1., above, provided the storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or the

containers are elevated or are otherwise protected from contact with accumulated liquid.

C6.3.4.2.4. Rainwater captured in secondary containment areas should be inspected and/or tested prior to release. The inspection or testing must be reasonably capable of detecting contamination by the hazardous waste in the containers. Contaminated water shall be treated as hazardous waste until determined otherwise.

C6.3.4.3. Special Requirements for Ignitable or Reactive Waste. Areas that store containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) inside the installation's boundary.

C6.3.4.4. Special Requirements for Incompatible Wastes

C6.3.4.4.1. Incompatible wastes and materials must not be placed in the same container.

C6.3.4.4.2. Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material.

C6.3.4.4.3. A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

C6.3.5. Recordkeeping Requirements

C6.3.5.1. Turn-in documents, e.g., DD Form 1348-1A or manifests, must be maintained for 3 years.

C6.3.5.2. Hazardous Waste Log. A written log will be maintained at the HWSA to record all hazardous waste handled and should consist of the following:

C6.3.5.2.1. Name/address of generator;

C6.3.5.2.2. Description and hazard class of the hazardous waste;

C6.3.5.2.3. Number and types of containers;

C6.3.5.2.4. Quantity of hazardous waste;

C6.3.5.2.5. Date stored;

C6.3.5.2.6. Storage location; and

C6.3.5.2.7. Disposition data, to include: dates received, sealed and transported and transporter used.

C6.3.5.3. The Hazardous Waste Log will be available to emergency personnel in the event of a fire or spill. Logs will be maintained until closure of the installation.

C6.3.5.4. Inspection Logs. Records of inspections should be maintained for a period of 3 years.

C6.3.5.5. Manifests. Manifests of incoming and outgoing hazardous wastes will be retained for a period of 3 years.

C6.3.5.6. Waste Analysis/Characterization Records will be retained until 3 years after closure of the HWSA.

C6.3.5.7. The installation will maintain records, identified in paragraphs C6.3.5.1., C6.3.5.5., and C6.3.5.6., for HWAPs on the installation.

C6.3.6. Contingency Plan

C6.3.6.1. Each installation will have a contingency plan that describes actions to be taken to contain and clean up spills and releases of hazardous waste in accordance with the provisions of Chapter 18.

C6.3.6.2. Copies of Contingency Plan. A current copy of the installation contingency plan must be:

C6.3.6.2.1. Maintained at each HWSA and HWAP, (HWAPs need maintain only portions of the contingency plan which are pertinent to their facilities and operation.); and

C6.3.6.2.2. Submitted to all police departments, fire departments, hospitals, and emergency response teams identified in the plan, and upon which the plan relies to provide emergency services. Plans should be available in both English and the host-nation language.

C6.3.7. Tank Systems. The following criteria apply to all storage tanks containing hazardous wastes. See Chapter 19 for criteria dealing with underground storage tanks containing petroleum, oil and lubricants and hazardous substances.

C6.3.7.1. Application. The requirements of this part apply to HWSAs that use tank systems for storing or treating hazardous waste. Tank systems that are used to store or treat hazardous waste that contains no free liquids and are situated inside a building with an impermeable floor are exempted from the requirements in paragraph C6.3.7.4., "Containment and Detection of Releases." Tank systems, including sumps that serve as part of a secondary containment system to collect or contain releases of hazardous wastes, are exempted from the requirements in paragraph C6.3.7.4.

C6.3.7.2. Assessment of Existing Tank System's Integrity. For each existing tank system that does not have secondary containment meeting the requirements of paragraph C6.3.7.4., below, installations must determine annually whether the tank system is leaking or is fit for use. Installations must obtain, and keep on file at the HWSA, a written assessment of tank system integrity reviewed and certified by a competent authority.

C6.3.7.3. Design and Installation of New Tank Systems or Components. Managers of HWSAs installing new tank systems or components must obtain a written assessment, reviewed and certified by a competent authority attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be stored or treated, and corrosion protection to ensure that it will not collapse, rupture, or fail.

C6.3.7.4. Containment and Detection of Releases. In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section must be:

C6.3.7.4.1. Provided for all new tank systems or components, prior to their being put into service;

C6.3.7.4.2. Provided for those existing tank systems when the tank system annual leak test detects leakage;

C6.3.7.4.3. Provided for tank systems that store or treat hazardous wastes by January 1, 1999;

C6.3.7.4.4. Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, groundwater, or surface water at any time during the use of the tank system; and capable of detecting and collecting releases and accumulated liquid until the collected material is removed; and

C6.3.7.4.5. Constructed to include one or more of the following; a liner external to the tank, a vault, or double-walled tank.

C6.3.7.5. General Operating Requirements

C6.3.7.5.1. Hazardous wastes or treatment reagents must not be placed in a tank system if they could cause the tank, its ancillary equipment, or the containment system to rupture, leak, corrode, or otherwise fail.

C6.3.7.5.2. The installation must inspect and log at least once each operating day:

C6.3.7.5.2.1. The above-ground portions of the tank system, if any, to detect corrosion or releases of waste;

C6.3.7.5.2.2. Data gathered from monitoring and leak-detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design; and

C6.3.7.5.2.3. The construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system (e.g., dikes), to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).

C6.3.7.5.3. The installation must inspect cathodic protection systems to ensure that they are functioning properly. The proper operation of the cathodic protection system must be confirmed within 6 months after initial installation and annually thereafter. All sources of impressed current must be inspected and/or tested, as appropriate, or at least every other month. The installation manager must document the inspections in the operating record of the HWSA.

C6.3.7.6. Response to Leaks or Spills and Disposition of Leaking or

Unfit-For-Use Tank Systems. A tank system or secondary containment system from which there has been a leak or spill, or that is unfit for use, must be removed from service immediately and repaired or closed. Installations must satisfy the following requirements:

C6.3.7.6.1. Cessation of Use; Prevention of Flow or Addition of Wastes. The installation must immediately stop the flow of hazardous waste into the tank system or secondary containment system and inspect the system to determine the cause of the release.

C6.3.7.6.2. Containment of Visible Releases to the Environment. The installation must immediately conduct an inspection of the release and, based upon that inspection:

C6.3.7.6.2.1. Prevent further migration of the leak or spill to soils or surface water; and

C6.3.7.6.2.2. Remove and properly dispose of any contamination of the soil or surface water.

C6.3.7.6.2.3. Remove free product to the maximum extent possible.

C6.3.7.6.2.4. Continue monitoring and mitigating for any additional fire and safety hazards posed by vapors or free products in subsurface structures.

C6.3.7.6.3. Make required notifications and reports.

C6.3.7.7. Closure. At closure of a tank system, the installation must remove or decontaminate hazardous waste residues, contaminated containment system components (liners, etc.), contaminated soils to the extent practicable, and structures and equipment.

C6.3.8. Standards for the Management of Used Oil and Lead-Acid Batteries

C6.3.8.1. Used Oil Burned for Energy Recovery. Used oil fuel may be burned only in the following devices:

C6.3.8.1.1. Industrial furnaces.

C6.3.8.1.2. Boilers that are identified as follows:

C6.3.8.1.2.1. Industrial boilers located on the site of a facility

engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes;

C6.3.8.1.2.2. Utility boilers used to produce electric power, steam or heated or cooled air or other gases or fluids;

C6.3.8.1.2.3. Used oil-fired space heaters provided that:

C6.3.8.1.2.3.1. The heater burns only used oil that the installation generates;

C6.3.8.1.2.3.2. The heater is designed to have a maximum capacity of not more than 0.5 million BTU per hour; and

C6.3.8.1.2.3.3. The combustion gases from the heater are properly vented to the ambient air.

C6.3.8.2. Prohibitions on Dust Suppression or Road Treatment. Used oil, hazardous waste, or used oil contaminated with any hazardous waste will not be used for dust suppression or road treatment.

C6.3.8.3. Lead-acid Batteries That Are To Be Recycled Will Be Managed as Hazardous Material. Lead-acid batteries that are not recycled will be managed as hazardous waste.

C6.3.9. Hazardous Waste Training

C6.3.9.1. Application. Personnel and their supervisors that are assigned duties involving actual or potential exposure to hazardous waste must successfully complete an appropriate training program prior to assuming those duties. Personnel assigned to such duty after the effective date of this Guide must work under direct supervision until they have completed appropriate training. Additional guidance is contained in DoD Instruction 6050.5, "DoD Hazard Communication Program" (reference (m)).

C6.3.9.2. Refresher Training. All personnel performing HW duties must successfully complete annual refresher hazardous waste training.

C6.3.9.3. Training Contents and Requirements. The training program must:

C6.3.9.3.1. Include sufficient information to enable personnel to

perform their assigned duties and fully comply with pertinent HW requirements.

C6.3.9.3.2. Be conducted by qualified trainers who have completed an instructor training program in the subject, have comparable academic credentials, or experience.

C6.3.9.3.3. Be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems.

C6.3.9.3.4. Address the following areas in particular for personnel whose duties include hazardous waste handling and management:

C6.3.9.3.4.1. Emergency procedures (response to fire/explosion/ spills; use of communications/alarm systems; body and equipment clean-up);

C6.3.9.3.4.2. Drum/container handling/storage; safe use of HW equipment; proper sampling procedures;

C6.3.9.3.4.3. Employee Protection. Personal Protective Equipment (PPE), safety and health hazards, hazard communication, worker exposure; and

C6.3.9.3.4.4. Recordkeeping. Recordkeeping, security, inspections, contingency plans, storage requirements, transportation requirements.

C6.3.9.4. Documentation of Training. Installations must document all hazardous waste training for each individual assigned duties involving actual or potential exposure to hazardous waste. Updated training records on personnel assigned duties involving actual or potential exposure to hazardous waste must be kept by the HWSA manager or the responsible installation office and retained for at least 3 years after termination of duty of these personnel.

C6.3.10. Hazardous Waste Disposal

C6.3.10.1. All DoD hazardous waste should normally be disposed of through the Defense Reutilization and Marketing Service (DRMS). A decision not to use the DRMS for hazardous waste disposal may be made in accordance with DoD Directive 4001.1 (reference (n)) for best accomplishment of the installation mission, but should be concurred in by the Component chain of command to ensure that installation contracts and disposal criteria are at least as protective as criteria used by DRMS.

C6.3.10.2. DoD Components must ensure that wastes generated by DoD operations and considered hazardous under either U.S. law or host-nation law are not disposed of in the host nation unless the disposal is conducted in accordance with the final governing standards and the following:

C6.3.10.2.1. When hazardous wastes cannot be disposed of in accordance with the final governing standards within the host nation, it will be either retrograded to the U.S. or, if permissible under international agreements, transferred to another country outside the U.S. where it can be disposed of in an environmentally sound manner and in compliance with the final governing standards applicable to the country of disposal, if any exist. Transhipment of hazardous wastes to another country other than the U.S. for disposal must be approved by, at a minimum, the Deputy Under Secretary of Defense for Environmental Security (DUSD(ES)).

C6.3.10.2.2. The determination of whether particular DoD-generated hazardous waste may be disposed of in a host nation will be made by the DoD executive agent, in coordination with the Unified Combatant Commander, the Director of Defense Logistics Agency (DLA), or other relevant DoD Components, and the Chief of the U.S. Diplomatic Mission.

C6.3.10.3. Disposal Procedures

C6.3.10.3.1. The determination of whether hazardous wastes may be disposed of in a host nation must include consideration of whether the means of treatment and/or containment technologies employed in the host-nation program, as enacted and enforced, effectively mitigate the hazards of such waste to human health and the environment and must consider whether the host-nation program includes:

C6.3.10.3.1.1. An effective system for tracking the movement of hazardous waste to its ultimate destination.

C6.3.10.3.1.2. An effective system for granting authorization or permission to those engaged in the collection, transportation, storage, treatment, and disposal of HW.

C6.3.10.3.1.3. Appropriate standards and limitations on the methods that may be used to treat and dispose of HW.

C6.3.10.3.1.4. Standards designed to minimize the possibility of fire, explosion, or any unplanned release or migration of HW or its' constituents to air, soil, surface, or groundwater.

C6.3.10.3.2. The executive agent must also be satisfied, either through reliance on the host-nation regulatory system and/or provisions in the disposal contracts, that:

C6.3.10.3.2.1. Persons and facilities in the waste management process have demonstrated the appropriate level of training and reliability; and

C6.3.10.3.2.2. Effective inspections, monitoring, and recordkeeping will take place.

C6.3.10.4. Host-nation facilities that either store, treat, or dispose of DoD-generated waste must be evaluated and approved by the host nation as being in compliance with their regulatory requirements. This evaluation and approval may consist of having a valid permit or host-nation equivalent for the hazardous waste that will be handled.

C6.3.10.5. Hazardous waste will be recycled or reused to the maximum extent practical. Safe and environmentally acceptable methods will be used to identify, store, prevent leakage, and dispose of hazardous waste, to minimize risks to health and the environment.

C6.3.10.6. Land Disposal Requirements. Hazardous wastes will only be land disposed when there is a reasonable degree of certainty that there will be no migration of hazardous constituents from the disposal site for as long as the wastes remain hazardous. Hazardous waste may be land disposed only in facilities meeting the following criteria:

C6.3.10.6.1. The land disposal facility has a liner and a leachate collection system. The liner will be of natural or man-made materials and restrict the downward or lateral escape of hazardous waste, hazardous constituents, or leachate. The permeability of such liners will be no greater than 10^{-7} cm/sec.

C6.3.10.6.2. The land disposal facility has a groundwater monitoring program capable of determining the facility's impact on the quality of water in the aquifers underlying the facility.

C6.3.10.6.3. The requirements of subparagraph C6.3.10.6.1. or subparagraph C6.3.10.6.2., above, may be waived for a particular land disposal facility by the executive agent if a written determination is made by a qualified geologist or geotechnical engineer that there is a low potential for migration of hazardous waste, hazardous constituents, or leachate from the facility to water supply wells, irrigation wells, or surface water. This determination will be based on an analysis of local precipitation, geologic conditions, physical properties, depth to groundwater, and proximity of water supply wells or surface water, as well as use of alternative design and operating practices. Methods for preventing migration will be at least as effective as liners and leachate collection systems required in subparagraph C6.3.10.6.1., above.

C6.3.10.7. Incinerator Standards. This paragraph applies to incinerators that incinerate hazardous waste as well as boilers and industrial furnaces that burn hazardous waste for any recycling purposes.

C6.3.10.7.1. Incinerators used to dispose of hazardous waste must be licensed or permitted by a component host-nation authority or approved by the executive agent. This license, permit, or approval must comply with the criteria listed in subparagraph C6.3.10.7.2., below.

C6.3.10.7.2. A license, permit, or executive agent approval for incineration of hazardous waste must require the incinerator to be designed to include appropriate equipment as well as to be operated according to management practices (including proper combustion temperature, waste feed rate, combustion gas velocity, and other relevant criteria) so as to effectively destroy hazardous constituents and control harmful emissions. A permitting, licensing, or approval scheme that would require an incinerator to achieve the standards set forth in either subparagraphs C6.3.10.7.2.1. or C6.3.10.7.2.2. below, is acceptable.

C6.3.10.7.2.1. The incinerator achieves a destruction and removal efficiency of 99.99 percent for the organic hazardous constituents that represent the greatest degree of difficulty of incineration in each waste or mixture of waste. The incinerator must minimize carbon monoxide in stack exhaust gas, minimize emission or particulate matter and emit no more than 1.8 Kg (4 pounds) of hydrogen chloride per hour; or

C6.3.10.7.2.2. The incinerator has demonstrated, as a condition for obtaining a license, permit, or executive agent approval, the ability to effectively destroy the organic hazardous constituents that represent the greatest degree of difficulty of incineration in each waste or mixture of waste to be burned. For

example, this standard may be met by requiring the incinerator to conduct a trial burn, submit a waste feed analysis and detailed engineering description of the facility, and provide any other information that may be required to enable the competent host-nation authority or the executive agent to conclude that the incinerator will effectively destroy the principal organic hazardous constituents of each waste to be burned.

C6.3.10.8. Treatment Technologies. The following treatment technologies may be used to reduce the volume or hazardous characteristics of wastes. Wastes that are categorized as hazardous on the basis of section AP1.1. and which, after treatment as described herein no longer exhibit any hazardous characteristic, may be disposed of as solid waste. Treatment residues of wastes categorized as hazardous under any other section of Appendix 1 will continue to be managed as hazardous wastes under the criteria of this Guide, including those for disposal. The treatment technologies listed below are provided as baseline treatment/disposal technologies for use in determining suitability of host-nation disposal alternatives. These technologies should not be implemented without consultation with the EEA, or the Combatant Commander, if there is no EEA.

C6.3.10.8.1. Organics

C6.3.10.8.1.1. Incineration in accordance with the requirements of subparagraph C6.3.10.7.1., above.

C6.3.10.8.1.2. Fuel substitution where the units are operated such that destruction of hazardous constituents are at least as efficient, and hazardous emissions are no greater than those produced by incineration.

C6.3.10.8.1.3. Biodegradation. Wastes are degraded by microbial action. Such units will be operated under aerobic or anaerobic conditions so that the concentrations of a representative compound or indicator parameter (e.g., total organic carbon) has been substantially reduced in concentration. The level to which biodegradation must occur and the process time vary depending on the hazardous waste being biodegraded.

C6.3.10.8.1.4. Recovery. Wastes are treated to recover organic compounds. This will be done using, but not limited to, one or more of the following technologies: distillation; thin film evaporation; steam stripping; carbon adsorption; critical fluid extraction; liquid extraction; precipitation/crystallization or phase separation techniques, such as decantation, filtration and centrifugation when used in conjunction with one of the above techniques.

C6.3.10.8.1.5. Chemical Degradation. The wastes are chemically degraded in such a manner so as to destroy hazardous constituents and control harmful emissions.

C6.3.10.8.2. Heavy Metals

C6.3.10.8.2.1. Stabilization or Fixation. Wastes are treated in such a way that soluble heavy metals are fixed by oxidation/reduction, or by some other means that renders the metals immobile in a landfill environment.

C6.3.10.8.2.2. Recovery. Wastes are treated to recover the metal fraction by thermal processing, precipitation, exchange, carbon absorption, or other techniques that yield non-hazardous levels of heavy metals in the residuals.

C6.3.10.8.3. Reactives. Any treatment that changes the chemical or physical composition of a material such that it no longer exhibits the characteristic for reactivity defined in Appendix 1.

C6.3.10.8.4. Corrosives. Corrosive wastes as defined in subsection AP1.1.3., below, will be neutralized to a pH value between 6.0 and 9.0. Other acceptable treatments include recovery, incineration, chemical or electrolytic oxidation, chemical reduction, or stabilization.

C6.3.10.8.5. Batteries. Mercury, nickel-cadmium, lithium, and lead-acid batteries will be processed in accordance with subparagraphs C6.3.10.8.2.1. or C6.3.10.8.2.2., above, to stabilize, fix or recover heavy metals, as appropriate, and in accordance with subparagraph C6.3.10.8.4., above, to neutralize any corrosives before disposal.

C6.3.10.9. DoD generators of HW shall not treat HW at the point of generation except for elementary neutralization. This shall not preclude installations from treating HW in accord with subsections C6.3.10.7. and C6.3.10.8., above.

C7. CHAPTER 7

SOLID WASTE

C7.1. SCOPE

This Chapter contains criteria to ensure that solid wastes are identified, classified, collected, transported, stored, treated and disposed of safely and in a manner protective of human health and the environment. These criteria apply to residential and commercial solid waste generated at the installation level. These criteria are part of integrated waste management. Policies concerning the recycling portion of integrated waste management are found in DoD Instruction 4715.4, "Pollution Prevention," (reference (e)) and service solid waste management manuals. The criteria in this Chapter deal with general solid waste. Criteria for specific types of solid waste that require special precautions are located in Chapter 6, "Hazardous Waste," Chapter 8, "Medical Waste," Chapter 14, "PCBs," and Chapter 11, "Pesticides."

C7.2. DEFINITIONS

C7.2.1. Bulky Waste. Large items of solid waste such as household appliances, furniture, large auto parts, trees, branches, stumps, and other oversize wastes whose large size precludes or complicates their handling by normal solid wastes collection, processing or disposal methods.

C7.2.2. Carry-out Collection. Collection of solid waste from a storage area proximate to the dwelling unit(s) or establishment where generated.

C7.2.3. Collection. The act of consolidating solid wastes (or materials that have been separated for the purpose of recycling) from various locations.

C7.2.4. Collection Frequency. The number of times collection is provided in a given period of time.

C7.2.5. Commercial Solid Waste. All types of solid wastes generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential and industrial wastes.

C7.2.6. Compactor Collection Vehicle. A vehicle with an enclosed body containing mechanical devices that conveys solid waste into the main compartment of the body and compresses it into a smaller volume of greater density.

C7.2.7. Construction and Demolition Waste. The waste building materials, packaging and rubble resulting from construction, remodeling, repair and demolition operations on pavements, houses, commercial buildings and other structures.

C7.2.8. Curb Collection. Collection of solid waste placed adjacent to a street.

C7.2.9. Cover Material. Material that is used to cover compacted solid wastes in a land disposal site.

C7.2.10. Daily Cover. Soil that is spread and compacted or synthetic material that is placed on the top and side slopes of compacted solid waste at least at the end of each operating day in order to control vectors, fire, moisture, and erosion and to assure an aesthetic appearance. Mature compost or other natural material may be substituted for soil if soil is not reasonably available in the vicinity of the landfill and the substituted material will control vectors, fire, moisture, and erosion and will assure an aesthetic appearance.

C7.2.11. Final Cover. A layer of soil, mature compost, other natural material (or synthetic material with an equivalent minimum permeability) that is applied to the landfill after completion of a cell or trench, including a layer of material that will sustain native vegetation, if any.

C7.2.12. Food Waste. The organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods, commonly called garbage.

C7.2.13. Generation. The act or process of producing solid waste.

C7.2.14. Hazardous Wastes. Refer to Chapter 6, "Hazardous Waste."

C7.2.15. Industrial Solid Waste. Solid waste generated by industrial processes and manufacturing.

C7.2.16. Institutional Solid Waste. Solid waste generated by educational, healthcare, correctional, and other institutional facilities.

C7.2.17. Land Application Unit. An area where wastes are applied onto or incorporated into the soil surface (excluding manure spreading operations) for agricultural purposes or for treatment or disposal.

C7.2.18. Lower Explosive Limit. The lowest percent by volume of a mixture of explosive gases in air that will propagate a flame at 25 degrees Celsius and atmospheric pressure.

C7.2.19. Municipal Solid Waste. Normally, residential and commercial solid waste generated within a community, not including yard waste.

C7.2.20. Municipal Solid Waste Landfill Unit (MSWLF). A discrete area of land or an excavation, on or off the installation, that receives household waste, and that is not a land application unit, surface impoundment, injection well, or waste pile. A MSWLF unit also may receive other types of wastes, such as commercial solid waste and industrial waste.

C7.2.21. Open Burning. Burning of solid wastes in the open, such as in an open dump.

C7.2.22. Open Dump. A land disposal site at which solid wastes are disposed of in a manner that does not protect the environment, is susceptible to open burning, and is exposed to the elements, vectors and scavengers.

C7.2.23. Residential Solid Waste. The wastes generated by the normal activities of households, including, but not limited to, food wastes, rubbish, ashes, and bulky wastes.

C7.2.24. Rubbish. A general term for solid waste, excluding food wastes and ashes, taken from residences, commercial establishments and institutions.

C7.2.25. Sanitary Landfill. A land disposal site employing an engineered method of disposing of solid wastes on land in a manner that minimizes environmental hazards by spreading the solid wastes in thin layers, compacting the solid wastes to the smallest practical volume, and applying and compacting cover material at the end of each operating day.

C7.2.26. Satellite Vehicle. A small collection vehicle that transfers its load into a larger vehicle operating in conjunction with it.

C7.2.27. Scavenging. The uncontrolled and unauthorized removal of materials at any point in the solid waste management system.

C7.2.28. Service Solid Waste Management Manual. Navy NAVFAC MO-213, Air Force AFR 91-8, Army TM 5-634 (reference (o)), or their successor documents.

C7.2.29. Sludge. The accumulated semi-liquid suspension of settled solids deposited from wastewaters or other fluids in tanks or basins. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows, or other common water pollutants.

C7.2.30. Solid Wastes. Garbage, refuse, sludge and other discarded materials, including solid, semi-solid, liquid, and contained gaseous materials resulting from industrial and commercial operations and from community activities. It does not include solids or dissolved material in domestic sewage or other significant pollutants in water resources, such as silt, dissolved or suspended solids in industrial wastewater effluent, dissolved materials in irrigation return flows or other common water pollutants.

C7.2.31. Solid Waste Storage Container. A receptacle used for the temporary storage of solid waste while awaiting collection.

C7.2.32. Stationary Compactor. A powered machine that is designed to compact solid waste or recyclable materials, and that remains stationary when in operation.

C7.2.33. Storage. The interim containment of solid waste after generation and prior to collection for ultimate recovery or disposal.

C7.2.34. Street Wastes. Material picked up by manual or mechanical sweepings of alleys, streets, and sidewalks; wastes from public waste receptacles; and material removed from catch basins.

C7.2.35. Transfer Station. A site at which solid wastes are concentrated for transport to a processing facility or land disposal site. A transfer station may be fixed or mobile.

C7.2.36. Vector. A carrier that is capable of transmitting a pathogen from one organism to another.

C7.2.37. Yard Waste. Grass and shrubbery clippings, tree limbs, leaves, and similar organic materials commonly generated in residential yard maintenance (also known as green waste).

C7.3. CRITERIA

C7.3.1. DoD solid wastes will be treated, stored, and disposed of in facilities that have been evaluated against subsections C7.3.12., C7.3.14., and C7.3.15. of this Chapter. These evaluated facilities will be used to the maximum extent practical.

C7.3.2. Installations will cooperate with host-nation officials, to the extent possible, in the solid waste management planning process.

C7.3.3. Installations will develop and implement a solid waste management strategy to reduce solid waste disposal. This strategy could include recycling, composting and waste minimization efforts.

C7.3.4. All solid wastes or materials that have been separated for the purpose of recycling will be stored in such a manner that they do not constitute a fire, health or safety hazard or provide food or harborage for vectors, and will be contained or bundled so as not to result in spillage.

C7.3.5. Storage of bulky wastes will include, but will not be limited to, removing all doors from large household appliances and covering the items to reduce both the problems of an attractive nuisance, and the accumulation of solid waste and water in and around the bulky items. Bulky wastes will be screened for the presence of ozone-depleting substances as defined in Chapter 2 or hazardous constituents as defined in Chapter 6. Readily detachable or removable hazardous waste will be segregated and disposed of in accordance with Chapters 6, 14, and 15.

C7.3.6. In the design of all buildings or other facilities that are constructed, modified, or leased after the effective date of these guidelines, there will be provisions for storage in accordance with these guidelines that will accommodate the volume of solid waste anticipated. Storage areas will be easily cleaned and maintained, and will allow for safe, efficient collection.

C7.3.7. Storage containers should be leakproof, waterproof, and vermin-proof, including sides, seams and bottoms and be durable enough to withstand anticipated usage and environmental conditions without rusting, cracking or deforming in a

manner that would impair serviceability. Storage containers should have functional lids.

C7.3.8. Containers should be stored on a firm, level, well-drained surface which is large enough to accommodate all of the containers and that is maintained in a clean, spillage-free condition.

C7.3.9. Recycling programs will be instituted on DoD installations in accordance with the policies in reference (e).

C7.3.10. Installations will not initiate new or expand existing waste landfill units without approval of the Combatant Commander with responsibility for the area where the landfill would be located, and only after justification that unique circumstances mandate a new unit.

C7.3.11. New DoD MSWLF units will be designed and operated in a manner that incorporates the following broad factors:

C7.3.11.1. Location restrictions in regard to airport safety (i.e., bird hazards), floodplains, wetlands, aquifers, seismic zones, and unstable areas;

C7.3.11.2. Procedures for excluding hazardous waste;

C7.3.11.3. Cover material criteria (e.g., daily cover), disease vector control, explosive gas control, air quality criteria (e.g., no open burning), access requirements, liquids restrictions and record keeping requirements; and

C7.3.11.4. Inspection program.

C7.3.11.5. Liner and leachate collection system designed consistent with location to prevent groundwater contamination that would adversely affect human health.

C7.3.11.6. A groundwater monitoring system unless the installation operating the landfill, after consultation with the Environmental Executive Agent, determines that there is no reasonable potential for migration of hazardous constituents from the MSWLF to the uppermost aquifer during the active life of the facility and the post-closure care period.

C7.3.12. Installations operating MSWLF units will:

C7.3.12.1. Use standard sanitary landfill techniques of spreading and

compacting solid wastes and placing daily cover over disposed solid waste at the end of each operating day.

C7.3.12.2. Establish criteria for unacceptable wastes based on site-specific factors such as hydrology, chemical and biological characteristics of the waste, available alternative disposal methods, environmental and health effects, and the safety of personnel.

C7.3.12.3. Implement a program to detect and prevent the disposal of hazardous wastes, infectious wastes, polychlorinated biphenyl (PCB) wastes, and wastes determined unsuitable for the specific MSWLF.

C7.3.12.4. Investigate options for composting of MSW as an alternative to landfilling or treatment prior to landfilling.

C7.3.12.5. Prohibit open burning, except for infrequent burning of agricultural wastes, silvicultural wastes, land-clearing debris, diseased trees, or debris from emergency clean-up operations.

C7.3.12.6. Develop procedures for dealing with yard waste and construction debris that keeps it out of MSWLF units to the maximum extent possible (e.g., composting, recycling).

C7.3.12.7. Operate in a manner to protect the health and safety of personnel associated with the operation.

C7.3.12.8. Maintain conditions that are unfavorable for the harboring, feeding and breeding of disease vectors.

C7.3.12.9. Ensure that methane gas generated by the MSWLF unit does not exceed 25 percent of the lower explosive limit for methane in structures on or near the MSWLF.

C7.3.12.10. Operate in an aesthetically acceptable manner.

C7.3.12.11. Operate in a manner to protect aquifers.

C7.3.12.12. Control public access to landfill facilities.

C7.3.12.13. Prohibit the disposal of bulk or non-containerized liquids, if possible.

C7.3.12.14. Maintain records on the preceding criteria.

C7.3.13. During closure and post-closure operations, installations will:

C7.3.13.1. Install a final cover system that is designed to minimize infiltration and erosion.

C7.3.13.2. Ensure that the infiltration layer is comprised of a minimum of 46 cm (18 inches) of earthen material, geotextiles, or combination thereof, that have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than .00005 cm/sec, whichever is less.

C7.3.13.3. Ensure that the final layer consists of a minimum of 21 cm (8 inches) of earth material that is capable of sustaining native plant growth.

C7.3.13.4. If possible, revegetate the final cap with native plants that are compatible with the landfill design, including the liner.

C7.3.13.5. Prepare a written closure plan that includes, at a minimum, a description of the monitoring and maintenance activities required to ensure the integrity of the final cover, a description of the planned uses of the site during the post-closure period, plans for continuing (during the post-closure period) leachate collection, ground-water monitoring, and methane monitoring, and a survey plot showing the exact site location. The plan will be kept as part of the installation's permanent records. Post-closure period will be a minimum of five (5) years.

C7.3.14. Open burning will not be the regular method of solid waste disposal. Where burning is the method, incinerators meeting air quality requirements in Chapter 2 will be used.

C7.3.15. A composting facility that is located on a DoD installation and that processes annually more than 5000 tons of sludge from a domestic wastewater treatment plant (see Chapter 4), will comply with the following criteria:

C7.3.15.1. Operators must maintain a record of the characteristics of the waste composted, sewage sludge and other materials, such as nutrient or bulking agents being composted including the source and volume or weight of the material.

C7.3.15.2. Access to the facility must be controlled. All access points must be secured when the facility is not in operation.

C7.3.15.3. By-products, including residuals and materials that can be recycled, must be stored to prevent vector intrusion and aesthetic degradation. Materials that are not composted must be removed periodically.

C7.3.15.4. Run-off water that has come in contact with composted waste, materials stored for composting, or residual waste must be diverted to a leachate collection and treatment system.

C7.3.15.5. The temperature and retention time for the material being composted must be monitored and recorded.

C7.3.15.6. Periodic analysis of the compost must be completed for the following parameters: percentage of total solids, volatile solids as a percentage of total solids, pH, ammonia, nitrate nitrogen, total phosphorous, cadmium, chromium, copper, lead, nickel, zinc, mercury and polychlorinated biphenyls.

C7.3.15.7. Compost must be produced by a process to further reduce pathogens. Two such acceptable methods are:

C7.3.15.7.1. Windrowing, which consists of an unconfined composting process involving periodic aeration and mixing such that aerobic conditions are maintained during the composting process; and

C7.3.15.7.2. The enclosed vessel method, which involves mechanical mixing of compost under controlled environmental conditions. The retention time in the vessel must be at least 72 hours with the temperature maintained at 55 degrees Celsius. A stabilization period of at least 7 days must follow the decomposition period.

C7.3.16. Classification and Use of Compost from DoD Composting Facilities. Compost produced at a composting facility that is located on a DoD installation and that processes annually more than 5000 tons of sludge from a domestic wastewater treatment plant (see Chapter 4), must be classified as "Class A" or "Class B" based on the criteria below and, depending on this classification, shall be subject to the restrictions on certain uses.

C7.3.16.1. Class A compost must be stored until the compost is matured, i.e., 60 percent decomposition has been achieved. Class A compost may contain contaminant levels no greater than the levels indicated below. The compost must be stabilized and contain no greater amounts of inert material than indicated. Allowable average contaminant concentrations in milligrams per kilogram on a dry weight basis are:

PCB	1
Cadmium	10
Chromium	1,000
Copper	500
Lead	500
Mercury	5
Nickel	100
Zinc	1,000

C7.3.16.2. Class B compost consists of any compost generated that fails to meet Class A standards.

C7.3.16.3. Compost distribution and end use.

C7.3.16.3.1. Class A compost may be distributed for unrestricted use, including agricultural applications.

C7.3.16.3.2. Class B compost may not be distributed for agricultural applications.

C8. CHAPTER 8

MEDICAL WASTE MANAGEMENT

C8.1. SCOPE

This Chapter contains criteria for the management of medical waste at medical, dental, research and development and, veterinary facilities generated in the diagnosis, treatment or immunization of human beings or animals or in the production or testing of biologicals subject to certain exclusions. This also includes mixtures of medical waste and hazardous waste. It does not apply to what would otherwise be household waste.

C8.2.. DEFINITIONS

C8.2.1. Infectious Agent. Any organism (such as a virus or a bacterium) that is capable of being communicated by invasion and multiplication in body tissues and capable of causing disease or adverse health impacts in humans.

C8.2.2. Infectious Hazardous Waste. Mixtures of infectious medical waste and hazardous waste to include solid waste such as fluids from a parasitology laboratory.

C8.2.3. Infectious Medical Waste. Solid waste produced by medical and dental treatment facilities that is specially managed because it has the potential for causing disease in man and may pose a risk to both individuals or community health if not managed properly, and that includes the following classes:

C8.2.3.1. Microbiology waste, including cultures and stocks of etiologic agents which, due to their species, type, virulence, or concentration, are known to cause disease in humans.

C8.2.3.2. Pathology waste, including human tissues and organs, amputated limbs or other body parts, fetuses, placentas, and similar tissues from surgery, delivery or autopsy procedures. Animal carcasses, body parts, blood and bedding are also included.

C8.2.3.3. Human blood and blood products (including serum, plasma, and other blood components), items contaminated with liquid or semi-liquid blood or blood products and items saturated or dripping with blood or blood products, and items caked

with blood or blood products, that are capable of releasing these materials during handling.

C8.2.3.4. Potentially infectious materials including human body fluids such as semen, vaginal secretions, cerebrospinal fluid, pericardial fluid, pleural fluid, peritoneal fluid, amniotic fluid, saliva in dental procedures, any body fluid that is visibly contaminated with blood, and all body fluids in situations where it is difficult or impossible to differentiate between body fluids.

C8.2.3.5. Sharps, including hypodermic needles, syringes, biopsy needles and other types of needles used to obtain tissue or fluid specimens, needles used to deliver intravenous solutions, scalpel blades, pasteur pipettes, specimen slides, cover slips, glass petri plates, and broken glass potentially contaminated with infectious waste.

C8.2.3.6. Infectious waste from isolation rooms, but only including those items that were contaminated or likely to be contaminated with infectious agents or pathogens to include excretion exudates and discarded materials contaminated with blood.

C8.2.4. Noninfectious Medical Waste. Solid waste created that does not require special management because it has been determined to be incapable of causing disease in man or that has been treated to render it noninfectious.

C8.2.5. Solid Waste. Any solid waste as defined in Chapter 7, "Solid Waste Management."

C8.2.6. Treatment. Any method, technique or process designed to change the physical, chemical, or biological character or composition of any infectious hazardous or infectious waste so as to render such waste non-hazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume. Treatment methods for infectious waste must eliminate infectious agents so that they no longer pose a hazard to persons who may be exposed.

C8.3. CRITERIA

C8.3.1. Infectious medical waste will be separated, if practical, from other solid waste at the point of origin.

C8.3.2. Mixtures of infectious medical wastes and hazardous wastes will be

handled as infectious hazardous waste under DoD 4160.21-M (reference (l)) and are the responsibility of the generating DoD Component. Priority will be given to the hazard that presents the greatest risk. Defense Reutilization and Marketing Offices (DRMOs) have no responsibility for this type of property until it is rendered noninfectious as determined by the appropriate DoD medical authority.

C8.3.3. Solid waste that is classified as a hazardous waste in accordance with Appendix 1 will be managed in accordance with the criteria in Chapter 6.

C8.3.4. Mixtures of other solid waste and infectious medical waste will be handled as infectious medical waste.

C8.3.5. Radioactive medical waste will be managed in accordance with Service directives.

C8.3.6. Infectious medical waste will be segregated, transported and stored in bags or receptacles a minimum of 3 mils thick having such durability, puncture resistance and burst strength as to prevent rupture or leaks during ordinary use.

C8.3.7. All bags or receptacles used to segregate, transport or store infectious medical waste will be clearly marked with the universal biohazard symbol and the word "BIOHAZARD" and will include marking that identifies the generator, date of generation and the contents.

C8.3.8. Sharps will only be discarded into rigid receptacles. Needles shall not be clipped, cut, bent or recapped before disposal.

C8.3.9. Infectious medical waste will be transported and stored to minimize human exposure, and will not be placed in chutes or dumbwaiters.

C8.3.10. Infectious medical waste will not be compacted unless converted to noninfectious medical waste by treatment as described in subsection C8.3.17., below. Containers holding sharps will not be compacted.

C8.3.11. All anatomical pathology waste (i.e., large body parts) must be placed in containers lined with plastic bags that comply with subsection C8.3.6., above, and may only be disposed of by burial after being treated for disposal by incineration or cremation.

C8.3.12. Blood, blood products and other liquid infectious wastes will be handled as follows:

C8.3.12.1. Bulk blood or blood products may only be decanted into clinical sinks and the emptied containers will continue to be managed as infectious medical waste.

C8.3.12.2. Suction canister waste from operating rooms will either be decanted into a clinical sink or will be sealed into leak-proof containers and incinerated.

C8.3.13. All personnel handling infectious medical waste will wear appropriate protective apparel or equipment such as gloves, coveralls, mask, and goggles sufficient to prevent the risk of exposure to infectious agents or pathogens.

C8.3.14. If infectious medical waste cannot be treated on-site, it will be managed during storage as follows:

C8.3.14.1. Infectious medical waste will be maintained in a nonputrescent state, using refrigeration as necessary.

C8.3.14.2. Infectious medical waste with multiple hazards (i.e., infectious hazardous waste, or infectious radioactive waste) will be segregated from the general infectious waste stream when additional or alternative treatment is required.

C8.3.15. Storage sites must be:

C8.3.15.1. Specifically designated;

C8.3.15.2. Constructed to prevent entry of insects, rodents and other pests;

C8.3.15.3. Designed to prevent access by unauthorized personnel; and

C8.3.15.4. Marked on the outside with the universal biohazard symbol and the word "BIOHAZARD" in both English and the language of the host nation.

C8.3.16. Bags and receptacles containing infectious medical waste must be placed into rigid or semi-rigid, leak-proof containers before being transported off-site.

C8.3.17. Infectious medical waste must be treated in accordance with Table C8.T1. and the following before disposal:

C8.3.17.1. Sterilizers must maintain the temperature at 121°C (250°F) for at least 30 minutes at 15 psi.

C8.3.17.2. The effectiveness of sterilizers must be checked at least weekly using Bacillus stearo thermophilus spore strips or an equivalent biological performance test.

C8.3.17.3. Incinerators used to treat medical waste must be designed and operated to maintain a minimum temperature and retention time sufficient to destroy all infectious agents and pathogens, and must meet applicable criteria in Chapter 2 for air emissions.

C8.3.17.4. Ash or residue from the incineration of infectious medical waste must be assessed for classification as hazardous waste in accordance with the criteria in Chapter 6. Ash that is determined to be hazardous waste must be managed in accordance with Chapter 6. All other residue will be disposed of in a landfill that complies with the criteria of Chapter 7.

C8.3.17.5. Chemical disinfection must be conducted using procedures and compounds approved by appropriate DoD medical authority for use on any pathogen or infectious agent suspected to be present in the waste.

C8.3.18. Installations will develop contingency plans for treatment or disposal of infectious medical waste should the primary means become inoperable.

C8.3.19. Spills of infectious medical waste will be cleaned up as soon as possible in accordance with the following:

C8.3.19.1. Response personnel must comply with subsection C8.3.13., above.

C8.3.19.2. Blood, body fluid and other infectious fluid spills must be removed with an absorbent material that must then be managed as infectious medical waste.

C8.3.19.3. Surfaces contacted by infectious medical waste must be washed with soap and water and chemically decontaminated in accordance with paragraph C8.3.17.5., above.

C8.3.20. Installations will keep records, for at least 3 years after the date of disposal, of the following information concerning infectious medical waste:

C8.3.20.1. Type of waste;

C8.3.20.2. Amount of waste (volume or weight);

C8.3.20.3. Treatment, if any, including date of treatment; and

C8.3.20.4. Disposition, including date of disposition, and if the waste is transferred to host nation facilities, receipts acknowledging paragraphs C8.3.20.1. - C8.3.20.3. for each transfer.

Table C8.T1. Treatment and Disposal Methods for Infectious Medical Waste

Type of Medical Waste	Method of Treatment	Method of Disposal
Microbiological	[1]Steam sterilization Chemical disinfection Incineration	[2]Municipal solid waste landfill (MSWLF) MSWLF MSWLF
Pathological	[3]Incineration [3]Cremation [4]Chemical Sterilization [4]Steam sterilization	MSWLF Burial [5]Domestic wastewater treatment plant (DWTP) DWTP
Bulk blood & suction canister waste	[6]Steam sterilization [6]Incineration	DWTP MSWLF
Sharps in sharps containers	Steam sterilization Incineration	MSWLF MSWLF

Notes

1. Preferred method for cultures and stocks because they can be treated at point of generation
2. See Chapter 7 for criteria for solid waste landfills.
3. Anatomical pathology waste (i.e., large body parts) must be treated either by incineration or cremation prior to disposal.
4. This only applies to placentas, small organs and small body parts that may be steam sterilized or chemically sterilized, ground, and discharged to a domestic wastewater treatment plant.
5. See Chapter 4 for criteria for domestic wastewater treatment plants.
6. Bulk blood or suction canister waste known to be infectious must be treated by incineration or steam sterilization before disposal.

C9. CHAPTER 9

PETROLEUM, OIL AND LUBRICANTS

C9.1. SCOPE

This Chapter contains criteria to control and abate pollution resulting from the storage, transport and distribution of petroleum products. Criteria for Underground Storage Tanks (USTs) containing POL products are addressed in Chapter 19.

C9.2. DEFINITIONS

C9.2.1. Bulk Storage Tanks. Refers to field-constructed tanks, usually having a capacity greater than 190,000 liters (50,000 gallons), and constructed above or below ground.

C9.2.2. Pipeline Facility. Includes new and existing pipes, pipeline rights of way, auxiliary equipment (e.g., valves, manifolds, etc.), and buildings or other facilities used in the transportation of POL.

C9.2.3. POL. Refined petroleum, oils and lubricants.

C9.2.4. Pol Facility. An installation with any individual above ground tank of 2,500 liters (660 gallons) or greater; aggregate above-ground storage of 5,000 liters (1,320 gallons) or greater; UST storage of greater than 159,000 liters (42,000 gallons); or a pipeline facility as identified in paragraph C9.2.6., below.

C9.2.5. Storage Tank. A fixed container designed to store POL.

C9.2.6. Underground Storage Tank (UST). Any tank including underground piping connected thereto, larger than 416 liters (110 gallons), that is used to contain POL products or hazardous materials and the volume of which, including the volume of connected pipes, is 10 percent or more beneath the surface of the ground, but does not include:

C9.2.6.1. Tanks containing heating oil used for consumption on the premises where it is stored;

C9.2.6.2. Septic tanks;

C9.2.6.3. Stormwater or wastewater collection systems;

C9.2.6.4. Flow-through process tanks;

C9.2.6.5. Surface impoundments, pits, ponds or lagoons;

C9.2.6.6. Field-constructed tanks; or

C9.2.6.7. Hydrant fueling systems.

C9.2.6.8. UST containing "de minimus" concentrations of regulated substances.

C9.2.6.9. Emergency spill or overflow containment UST systems that are expeditiously emptied after use.

C9.2.6.10. Storage tanks located in an accessible underground area (such as a basement or vault) if the storage tank is situated upon or above the surface of the floor.

C9.3. CRITERIA

C9.3.1. Spill Plans. Each installation will have a contingency plan to manage spills and releases at all POL facilities. Criteria for these plans are found in Chapter 18 of this Guide. These plans must be written specifically for each POL facility, certified by a competent technical authority, and updated at least every 5 years, or when there are significant changes to operations.

C9.3.2. General Tank Provisions. All POL above-ground bulk storage tanks must meet the following requirements:

C9.3.2.1. All above-ground bulk POL storage tanks must be provided with a secondary means of containment (dike and basin) capable of holding the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation and expansion of product.

C9.3.2.2. Maximum permeability for containment areas will be 10-7 cm/sec.

C9.3.2.3. Drainage of stormwaters from containment areas will be controlled by a valve that is locked closed when not in active use.

C9.3.2.4. Before draining stormwaters from containment areas they will be inspected for petroleum sheen. If a petroleum sheen is present it must be collected with adsorbent material prior to drainage, or treated using an oil-water separator. Disposal of adsorbent material exhibiting the hazardous characteristics in Appendix 1 will be in accordance with Chapter 6 of this Guide.

C9.3.3. Additional Tank Wastes Provisions. POL tank cleaning wastes frequently have hazardous characteristics (as defined in section AP1.1.) and must be handled and disposed of according to the requirements of Chapter 6 of this Guide. These wastes and handling procedures include:

C9.3.3.1. Tank cleaning wastes (sludge and washwaters) will be disposed of in accordance with the criteria of Chapter 6 of this Guide, unless testing confirms they do not have hazardous characteristics as defined in section AP1.1.

C9.3.3.2. Tank bottom waters, which are periodically drained from bulk storage tanks, will be collected and disposed of in accordance with Chapter 6 of this Guide, unless testing confirms they do not have hazardous characteristics.

C9.3.4. General POL Pipeline Provisions for Testing and Maintenance. All pipeline facilities carrying POL must be tested and maintained in accordance with recognized U.S. Industry standards. This includes these requirements:

C9.3.4.1. Each pipeline operator handling POL will prepare and follow a procedural manual for operations, maintenance and emergencies.

C9.3.4.2. Each new pipeline facility and each facility in which pipe has been replaced or relocated must be tested in accordance with recognized U.S. Industry standards, without leakage before being placed in-service.

C9.3.5. General POL Pipeline Construction. All pipeline facilities with a construction start date after October 1, 1994, will be designed and constructed to meet recognized U.S. Industry standards.

C9.3.6. POL Spills and Leaks. To control accidental POL releases, the installation must follow the guidance in the spill plan required under subsection C18.3.3. in Chapter 18.

C10. CHAPTER 10

NOISE--RESERVED

C10.1. NOISE - RESERVED

C11. CHAPTER 11

PESTICIDES

C11.1. SCOPE

This Chapter contains criteria regulating the use, storage and handling of pesticides, herbicides, and defoliants, but does not address the use of these materials by individuals acting in an unofficial capacity in a residence or garden. For the purposes of this Guide, pesticides generically refers to pesticides, herbicides and defoilants. The disposal of pesticides is covered in Chapters 6 and 7.

C11.2. DEFINITIONS

C11.2.1. Certified Pesticide Applicators. Personnel who apply pesticides or supervise the use of pesticides, and who have been formally certified in accordance with the Department of Defense Manual, DoD Pest Management Training and Certification (DoD 4150.7-M) (reference (p)) (which accepts host-nation certification in appropriate circumstances).

C11.2.2. Integrated Pest Management (IPM). A planned program, incorporating continuous monitoring, education, record-keeping, and communication to prevent pests and disease vectors from causing unacceptable damage to operations, people, property, materiel, or the environment. IPM uses targeted, sustainable (effective, economical, environmentally sound) methods including education, habitat modification, biological control, genetic control, cultural control, mechanical control, physical control, regulatory control, and where necessary, the judicious use of least-hazardous pesticides.

C11.2.3. Pests. Arthropods, birds, rodents, nematodes, fungi, bacteria, viruses, algae, snails, marine borers, snakes, weeds, undesirable vegetation, and other organisms (except for microorganisms that cause human or animal disease) that adversely affect the well-being of humans or animals, attack real property, supplies, equipment or vegetation, or are otherwise undesirable.

C11.2.4. Pest Management Consultant. Professional DoD pest management personnel located at Component headquarters, field operating agencies, major commands, facilities engineering field divisions or activities, or area support activities who provide technical and management guidance for the conduct of installation pest management operations. Some pest management consultants may be designated by their Component as certifying officials.

C11.2.5. Pesticide. Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests.

C11.2.6. Pesticide Waste. Materials subject to pesticide disposal restrictions including:

C11.2.6.1. Any pesticide that has been identified by the pest management consultant as canceled under U.S. or host-nation authority;

C11.2.6.2. Any pesticide that does not meet specifications, is contaminated, has been improperly mixed, or otherwise unusable, whether concentrated or diluted;

C11.2.6.3. Any material used to clean up a pesticide spill; or

C11.2.6.4. Any containers, equipment, or material contaminated with pesticides. Empty pesticide containers that have been triple-rinsed are not considered hazardous waste, and can be disposed of as normal solid waste.

C11.2.7. Registered Pesticide. A pesticide that has been registered and approved for sale or use within the United States or the host nation.

C11.3. CRITERIA

C11.3.1. All pesticide applications, excluding arthropod skin and clothing repellents, will be recorded using DD Form 1532-1, "Pest Management Maintenance Report," or a computer-generated equivalent. These records will be archived for permanent retention in accordance with specific Service procedures. The Pest Management Maintenance Report has been assigned Report Control Symbol DD-A&T(A&AR)1080 in accordance with DoD 8910-M (reference (f)).

C11.3.2. Installations will implement and maintain a current pest management plan that includes measures for all installation activities and satellite sites that perform pest control. This written plan will include IPM procedures for preventing pest

problems in order to minimize the use of pesticides. The plan must be reviewed and approved in writing by the appropriate pest management consultant.

C11.3.3. All pesticide applications will be made by certified pesticide applicators, with the following exceptions:

C11.3.3.1. New DoD employees who are not certified may apply pesticides during an apprenticeship period not to exceed 2 years and only under the supervision of a certified pesticide applicator;

C11.3.3.2. Arthropod skin and clothing repellents; and

C11.3.3.3. Pesticides applied as part of an installation's self-help program.

C11.3.4. All pesticide applicators will be included in a medical surveillance program to monitor the health and safety of persons occupationally exposed to pesticides.

C11.3.5. All pesticide applicators will be provided with personal protective equipment appropriate for the work they perform and the types of pesticides to which they may be exposed.

C11.3.6. Installations will only use registered pesticides approved in writing by the appropriate pest management consultant. This may be documented as part of the approval of the pest management plan.

C11.3.7. Pesticides will be included in the installation spill contingency plan (see Chapter 18).

C11.3.8. Pest management facilities, including mixing and storage areas, will comply with Military Handbook 1028/8A (reference (q)).

C11.3.9. Labels will bear the appropriate use instructions and precautionary message based on the toxicity category of the pesticide ("danger," "warning," or "caution"). If foreign nationals will be using the pesticides, the precautionary messages and use instructions will be in English and in the prevalent local languages.

C11.3.10. Material Safety Data Sheets (MSDSs) and labels for all pesticides will be available at the storage and holding facility.

C11.3.11. Pesticide storage areas will contain a readily visible current inventory of all items in storage, including items awaiting disposal, and should be regularly inspected and secured to prevent unauthorized access.

C11.3.12. Unless otherwise restricted or canceled, pesticides in excess of installation needs will be redistributed within the supply system or disposed of in accordance with procedures outlined below.

C11.3.13. The generator of pesticide wastes will determine if waste is considered hazardous or not in accordance with Chapter 6 of this Guide.

C11.3.13.1. Pesticide waste determined to be hazardous waste will be disposed of in accordance with the criteria for hazardous waste disposal in Chapter 6.

C11.3.13.2. Pesticide waste that is determined not to be a hazardous waste will be disposed of in accordance with the label instructions, through DRMO, as a solid waste. Pesticide containers shall be crushed or the top and bottom portions shall be removed to prevent reuse.

C12. CHAPTER 12

HISTORIC AND CULTURAL RESOURCES

C12.1. SCOPE

This Chapter contains criteria for required plans and programs needed to ensure proper protection and management of cultural resources, such as properties on the World Heritage List or on the host country's list equivalent to the U.S. National Register of Historic Places.

C12.2. DEFINITIONS

C12.2.1. Adverse Effect. Changes that diminish the quality or significant value of historic or cultural resources.

C12.2.2. Archeological Resource. Any material remains of prehistoric or historic human life or activities. Such resources include, but are not limited to: pottery, basketry, bottles, weapons, weapon projectiles, tools, structures or portions of structures, pit houses, rock paintings, rock carvings, intaglios, graves, human skeletal materials, or any portion of any of the foregoing items.

C12.2.3. Cultural Mitigation. Specific steps designed to lessen the adverse effects of a DoD action on a historical or cultural resource, including:

C12.2.3.1. Limiting the magnitude of the action;

C12.2.3.2. Relocating the action in whole or in part;

C12.2.3.3. Repairing, rehabilitating, or restoring the affected resources, effected property; and

C12.2.3.4. Recovering and recording data from cultural properties that may be destroyed or substantially altered.

C12.2.4. Historic and Cultural Resources Program. Identification, evaluation, documentation, curation, acquisition, protection, rehabilitation, restoration, management, stabilization, maintenance, recording, and reconstruction of historic and cultural resources and any combination of the foregoing.

C12.2.5. Historic or Cultural Resource. Physical remains of any prehistoric or historic district, site, building, structure, or object significant in world, national or local history, architecture, archeology, engineering, or culture. The term includes artifacts, archeological resources, records, and material remains that are related to such a district, site, building, structure, or object. The term also includes any property listed on the World Heritage List or the host nation's equivalent of the National Register of Historic Places.

C12.2.6. Inventory. To determine the location of historic and cultural resources that may have world, national or local significance.

C12.2.7. Material Remains. Physical evidence of human habitation, occupation, use, or activity, including the site, loci, or context in which such evidence is situated including:

C12.2.7.1. Surface or subsurface structures;

C12.2.7.2. Surface or subsurface artifact concentrations or scatters;

C12.2.7.3. Whole or fragmentary tools, implements, containers, weapons, clothing, and ornaments;

C12.2.7.4. By-products, waste products, or debris resulting from manufacture or use;

C12.2.7.5. Organic waste;

C12.2.7.6. Human remains;

C12.2.7.7. Rock carvings, rock paintings, and intaglios;

C12.2.7.8. Rock shelters and caves;

C12.2.7.9. All portions of shipwrecks; or

C12.2.7.10. Any portion or piece of any of the foregoing.

C12.2.8. Preservation. The act or process of applying measures to sustain the existing form, integrity, and material of a building or structure, and the existing form and vegetative cover of a site. It may include initial stabilization work where necessary, as well as ongoing maintenance of the historic building materials.

C12.2.9. Protection. The act or process of applying measures designed to affect the physical condition of a property by safeguarding it from deterioration, loss, attack or alteration, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally temporary and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent.

C12.3. CRITERIA

C12.3.1. Installation commanders shall take into account the effect of any action on any property listed on the World Heritage List or on the applicable country's equivalent of the National Register of Historic Places for purposes of avoiding or mitigating any adverse effects.

C12.3.2. Installations shall have access to the World Heritage List and the host nation's equivalent of the National Register of Historic Places.

C12.3.3. Installation commanders shall ensure that personnel performing historic or cultural resource functions have the requisite expertise in world, national and local history and culture. This may be in-house, contract, or through consultation with another agency. Government personnel directing such functions must have training in historic or cultural resource management.

C12.3.4. Installations shall, after coordination with the host-nation installation commander or similar appropriate host-nation authorities, and if financially and otherwise practical:

C12.3.4.1. Inventory historic and cultural resources in areas under DoD control. An inventory shall be developed from a records search and visual survey.

C12.3.4.2. Develop a plan for the protection and preservation of historic and cultural resources identified on the installation inventory and for mitigation of any adverse effects.

C12.3.4.3. Establish measures sufficient to protect known historic or cultural resources until appropriate mitigation or preservation can be completed.

C12.3.4.4. Establish measures sufficient to protect known archeological resources until appropriate mitigation or preservation can be completed.

C12.3.5. Installation commanders shall establish measures to prevent DoD personnel from disturbing or removing historic or cultural resources without permission of the host nation.

C12.3.6. Installation commanders shall ensure that planning for major actions includes consideration of possible effects on historic or cultural resources.

C12.3.7. If potential historic or cultural resources not previously inventoried are discovered in the course of a DoD action, the newly discovered items will be preserved and protected pending a decision on final disposition by the installation commander. The decision on final disposition will be made by the installation commander after coordination with the host-nation installation commander or similar appropriate host-nation authorities.

C13. CHAPTER 13

NATURAL RESOURCES AND ENDANGERED SPECIES

C13.1. SCOPE

This Chapter establishes criteria for required plans and programs needed to ensure proper protection, enhancement, and management of natural resources and any species (flora or fauna) declared endangered or threatened by either the United States or host-nation governments.

C13.2. DEFINITIONS

C13.2.1. Adverse Effect. Changes that diminish the quality or significant value of natural resources. For biological resources, adverse effects include significant decreases in overall population diversity, abundance and fitness.

C13.2.2. Conservation. Planned management, use and protection; continued benefit for present and future generations; and prevention of exploitation, destruction and/or neglect of natural resources.

C13.2.3. Host-Nation Protected Species. Any species of flora or fauna listed or designated by the host nation, because the species continued existence is, or is likely to be, threatened and is therefore subject to special protection from destruction or adverse modification of associated habitat.

C13.2.4. Management Plan. A document describing natural resources, their quantity, condition, and actions to ensure their conservation and good stewardship.

C13.2.5. Natural Resource. All living and inanimate materials supplied by nature that are of aesthetic, ecological, educational, historical, recreational, scientific or other value.

C13.2.6. Natural Resources Management. Action taken to protect, manipulate, alter, or natural resources in harmony to meet present and future human needs.

C13.2.7. Significant Land or Water Areas. Land or water area that is normally 500 or more acres outside the cantonment area; areas of smaller size are included if they have natural resources that are especially vulnerable to disturbance.

C13.2.8. Threatened and Endangered Species. Any species of fauna or flora, listed in Table C13.T1. or C13.T2., respectively.

C13.3. CRITERIA

C13.3.1. Installations that have land and water areas shall take reasonable steps to protect and enhance known endangered or threatened species and host-nation protected species and their habitat.

C13.3.2. Installation shall will maintain, or have access to, Table C13.T1., Table C13.T2., and a current list of host-nation protected species.

C13.3.3. Installations with significant land or water areas shall, after coordination with the host-nation installation commander or similar appropriate host-nation authorities, develop natural resources management plans.

C13.3.4. Installations having natural resources management plans shall, after coordination with the host-nation installation commander or similar appropriate host-nation authorities, and if financially and otherwise practical, and in such a way that there is no net loss of mission capability:

C13.3.4.1. Initiate surveys for endangered or threatened species and host-nation protected species identification, or support host nation-initiated surveys.

C13.3.4.2. Implement natural resources management plans.

C13.3.5. The host-nation installation commander, or if there is no host nation-installation commander the U.S. Ambassador, will be notified of the discovery of any endangered or threatened species and host-nation protected species not previously known to be present on the installation.

C13.3.6. Installations shall maintain grounds to meet designated mission use and ensure harmony with the natural landscape and/or the adjacent host nation-facilities where practical.

C13.3.7. Installations shall ensure that personnel performing natural resource functions have the requisite expertise in the management of their discipline (i.e., endangered or threatened species, host-nation protected species, wetlands, soil stabilization). This may be in-house, contract, or through consultation with another agency. Government personnel directing such functions must have training in natural resources management.

C13.3.8. Installations shall place emphasis on the maintenance and protection of habitats favorable to the reproduction and survival of indigenous plants, fish and wildlife.

C13.3.9. Land and vegetative management activities will be consistent with current conservation and land use principles (e.g., ecosystem protection, biodiversity conservation and mission-integrated land use).

C13.3.10. Installations shall utilize protective vegetative cover or other standard soil erosion/sediment control practices to control dust, stabilize sites and avoid silting of streams.

Table C13.T1. Endangered and Threatened Animals

Common Name	Scientific Name	OCONUS T&E Listed
Mammals		
Bandicoot, barred	Perameles bougainville	Australia
Bandicoot, desert	Perameles eremiana	Australia
Bandicoot, lesser rabbit	Macrotis leucura	Australia
Bandicoot, pig-footed	Chaeropus ecaudatus	Australia
Bandicoot, rabbit	Macrotis lagotis	Australia
Banteng	Bos javanicus (=banteng)	Southeast Asia
Bat, Bulmer's fruit (flying fox)	Aproteles bulmerae	Papua New Guinea
Bat, bumblebee	Craseonycteris thonglongyai	Thailand
Bat, lesser (=Sanborn's) long-nosed	Leptonycteris curasoae (=sanborni) yerbabuenae	Central America
Bat, Mexican long-nosed	Leptonycteris nivalis	Central America
Bear, brown	Ursus arctos arctos	Italy
Cat, Iriomote	Felis (Mayailurus) iriomotensis	Japan (Iriomote Island, Ryukyu Islands)
Cat, leopard	Felis bengalensis bengalensis	Southeast Asia
Cat, marbled	Felis marmorata	Southeast Asia
Cat, Temminck's (=golden cat)	Felis temmincki	Southeast Asia
Chamois, Apennine	Rupicapra rupicapra ornata	Italy
Cheetah	Acinonyx jubatus	Africa to India
Chimpanzee	Pan troglodytes	Wherever found in the wild or in captivity
Deer, Eld's brow-antlered	Cervus eldi	Southeast Asia
Deer, Formosan sika	Cervus nippon taiouanus	Taiwan
Deer, hog	Axis (=Cervus) porcinus annamiticus	Thailand
Deer, musk	Moschus spp.	India
Deer, Ryukyu sika	Cervus nippon keramae	Japan (Ryukyu Islands)
Dhole (=Asiatic wild dog)	Cuon alpinus	Korea, Southeast Asia
Dibbler	Antechinus apicalis	Australia
Dugong	Dugong dugon	East Africa to southern Japan
Elephant, African	Loxodonta africana	Africa
Elephant, Asian	Elephas maximus	South-central and southeastern Asia
Gazelle, Arabian	Gazella gazella	Arabian Peninsula, Sinai
Gazelle, sand	Gazella subgutturosa marica	Arabian Peninsula
Gazelle, Saudi Arabian	Gazella dorcas saudiya	Arabian Peninsula

Table C13.T1. Endangered and Threatened Animals--Continued

Common Name	Scientific Name	OCONUS T&E Listed
Gazelle, slender-horned (=Rhim)	Gazella leptoceros	Egypt
Gibbons	Hylobates spp. (including Nomascus)	Southeast Asia
Goral	Nemorhaedus goral	East Asia
Hutia, Cabrera's	Capromys angelcabrerai	Cuba
Hutia, dwarf	Capromys nana	Cuba
Hutia, large-eared	Capromys auritus	Cuba
Hutia, little earth	Capromys sanfelipensis	Cuba
Ibex, Pyrenean	Capra pyrenaica pyrenaica	Spain
Jaguarundi	Felis yagouaroundi panamensis	Panama
Kangaroo, Tasmanian forester	Macropus giganteus tasmaniensis	Australia (Tasmania)
Kouprey	Bos sauveli	Thailand
Leopard, clouded	Neofelis nebulosa	Southeastern Asia, Taiwan
Leopard	Panthera pardus	Africa, Asia
Lion, Asiatic	Panthera leo persica	Turkey
Lynx, Spanish	Felis (=Lynx) pardina	Spain
Macaque, Formosan rock	Macaca cyclopis	Taiwan
Macaque, Japanese	Macaca fuscata	Japan (Shikoku, Kyushu and Honshu Islands)
Manatee, West Indian (=Florida)	Trichechus manatus	Caribbean Sea, South America
Margay	Felis wiedii	Central Mexico southward and South America
Marsupial, eastern jerboa	Antechinomys laniger	Australia
Marsupial-mouse, large desert	Sminthopsis psammophila	Australia
Marsupial-mouse, long-tailed	Sminthopsis longicaudata	Australia
Marten, Formosan yellow-throated	Martes flavigula chrysospila	Taiwan
Monkey, howler	Alouatta palliata (=villosa)	Mexico to South America
Monkey, red-backed squirrel	Saimiri oerstedii	Panama
Monkey, spider	Ateles geoffroyl panamensis	Panama
Mouse, Australian native	Notomys aquilo	Australia
Mouse, Australian native	Zyzomys (=Notomys) pedunculatus	Australia
Mouse, Field's	Pseudomys fieldi	Australia
Mouse, Gould's	Pseudomys gouldii	Australia
Mouse, New Holland	Pseudomys novaehollandiae	Australia
Mouse, Shark Bay	Pseudomys praeconis	Australia

Table C13.T1. Endangered and Threatened Animals--Continued

Common Name	Scientific Name	OCONUS T&E Listed
Mouse, Shortridge's	Pseudomys shortridgei	Australia
Mouse, Smoky	Pseudomys fumeus	Australia
Mouse, western	Pseudomys occidentalis	Australia
Native-cat, eastern	Dasyurus viverrinus	Australia
Numbat	Myrmecobius fasciatus	Australia
Ocelot	Felis pardalis	Central and South America
Oryx, Arabian	Oryx leucoryx	Arabian Peninsula
Otter, giant	Pteronura brasiliensis	South America
Otter, long-tailed	Lutra longicaudis (incl. platensis)	South America
Pangolin (=scaly anteater)	Manis temmincki	Africa
Planigale, little	Planigale ingrami subtilissima	Australia
Planigale, southern	Planigale tenuirostris	Australia
Possum, mountain pygmy	Burramys parvus	Australia
Possum, scaly-tailed	Wyulda squamicaudata	Australia
Puma, Costa Rican	Felis concolor costaricensis	Panama
Quokka	Setonix brachyurus	Australia
Rabbit, Ryukyu	Pentalagus furnessi	Japan (Ryukyu Islands)
Rat, false water	Xeromys myoides	Australia
Rat, stick-nest	Leporillus conditor	Australia
Rat-kangaroo, brush-tailed	Bettongia penicillata	Australia
Rat-kangaroo, Gaimard's	Bettongia gaimardi	Australia
Rat-kangaroo, Lesuer's	Bettongia lesueur	Australia
Rat-kangaroo, plain	Caloprymnus campestris	Australia
Rat-kangaroo, Queensland	Bettongia tropica	Australia
Rhinoceros, Javan	Rhinoceros sondaicus	Thailand
Sea-lion, Steller (=northern)	Eumetopias jubatus	Canada
Seledang (=Gaur)	Bos gaurus	Bangladesh, Southeast Asia, India
Solenodon, Cuban	Solenodon (Atopogale) cubanus	Cuba
Tapir, Asian	Tapirus indicus	Thailand
Tiger	Panthera tigris	Temperate and tropical Asia
Tiger, Tasmanian (=Thylacine)	Thylacinus cynocephalus	Australia
Urial	Ovis musimon (=orientalis) ophion	Cyprus
Vicuna	Vicugna vicugna	South America (Andes)
Wallaby, banded hare	Lagostrophus fasciatus	Australia
Wallaby, brindled nail-tailed	Onychogalea fraenata	Australia
Wallaby, crescent nail-tailed	Onychogalea lunata	Australia
Wallaby, Parma	Macropus parma	Australia
Wallaby, western hare	Lagorchestes hirsutus	Australia

Table C13.T1. Endangered and Threatened Animals--Continued

Common Name	Scientific Name	OCONUS T&E Listed
Wallaby, yellow-footed rock	Petrogale xanthopus	Australia
Wombat, hairy-nosed (=Barnard's and Queensland hairy-nosed	Lasiorhinus krefftii (formerly L. barnardi and L. gillespiei)	Australia
Birds		
Albatross, short-tailed	Diomedea albatrus	North Pacific Ocean-- Japan
Bristlebird, western rufous	Dasyornis broadbenti littoralis	Australia
Bristlebird, western	Dasyornis brachypterus longirostris	Australia
Bullfinch, Sao Miguel (finch)	Pyrrhula pyrrhula murina	Eastern Atlantic Ocean--Azores
Caracara, Audubon's crested	Polyborus plancus audubonii	Panama, Cuba
Crane, Cuba sandhill	Grus canadensis nesiotes	West Indies--Cuba
Crane, hooded	Grus monacha	Japan
Crane, Japanese	Grus japonensis	Japan, Korea
Curlew, Eskimo	Numenius borealis	Northern Canada to Argentina
Duck, white-winged wood	Cairina scutulata	Thailand
Eagle, Greenland white-tailed	Haliaeetus albicilla groenlandicus	Greenland and adjacent Atlantic islands
Eagle, Spanish imperial	Aquila heliaca adalberti	Spain
Egret, Chinese	Egretta eulophotes	Korea
Falcon, American peregrine	Falco peregrinus anatum	Canada to South America
Falcon, Eurasian peregrine	Falco peregrinus peregrinus	Europe, Eurasia south to Africa and Mideast
Goose, Aleutian Canada	Branta canadensis leucopareia	Japan
Grasswren, Eyrean (flycatcher)	Amytornis goyderi	Australia
Greenshank, Nordmann's	Tringa guttifer	Japan
Honeyeater, helmeted	Meliphaga cassidix	Australia
Hornbill, helmeted	Rhinoplax vigil	Thailand
Ibis, Japanese crested	Nipponia nippon	Japan, Korea
Ibis, northern bald	Geronticus eremita	Southern Europe
Kite, Cuba hook-billed	Chondrohierax uncinatus wilsonii	West Indies--Cuba
Ostrich, Arabian	Struthio camelus syriacus	Saudi Arabia
Parakeet, golden-shouldered (=hooded)	Psephotus chrysopterygius	Australia
Parakeet, Norfolk Island	Cyanoramphus novaezelandiae cookii	Australia (Norfolk Island)
Parakeet, orange-bellied	Neophema chrysogaster	Australia
Parakeet, paradise (=beautiful)	Psephotus pulcherrimus	Australia
Parakeet, scarlet-chested (=splendid)	Neophema splendida	Australia

Table C13.T1. Endangered and Threatened Animals--Continued

Common Name	Scientific Name	OCONUS T&E Listed
Parakeet, turquoise	Neophema pulchella	Australia
Parrot, Australian	Geopsittacus occidentalis	Australia
Parrot, Bahaman or Cuban	Amazona leucocephala	West Indies--Cuba
Parrot, ground	Pezoporus wallicus	Australia
Pelican, brown	Pelecanus occidentalis	Central and South America
Pheasant, Mikado	Syrmaticus mikado	Taiwan
Pheasant, Swinhoe's	Lophura swinhoii	Taiwan
Pigeon, Azores wood	Columba palumbus azorica	East Atlantic Ocean Azores
Plover, piping	Charadrius melodus	Canada
Quetzel, resplendent	Pharomachrus mocinno	Mexico to Panama
Rail, Lord Howe wood	Tricholimnas sylvestris	Australia (Lord Howe Entire Island)
Robin, scarlet-breasted (flycatcher)	Petroica multicolor multicolor	Australia (Norfolk Island)
Scrub-bird, noisy	Atrichornis clamosus	Australia
Siskin, red	Carduelis (=Spinus) cucullata	South America
Stork, oriental white	Ciconia ciconia boyciana	Japan, Korea
Tern, roseate	Sterna dougallii dougallii	Western Hemisphere
Wanderer, plain (collared-hemipode)	Pedionomous torquatus	Australia
Warbler (wood), Bachman's	Vermivora bachmanii	Cuba
Warbler (wood), golden-cheeked	Dendroica chrysoparia	Honduras
Warbler (wood), Kirtland's	Dendroica kirtlandii	Canada
Whipbird, western	Psophodes nigrogularis	Australia
Woodpecker, ivory-billed	Campephilus principalis	Cuba
Woodpecker, Tristam's	Dryocopus javensis richardsi	Korea
Reptiles		
Crocodile, American	Crocodylus acutus	Central and South America
Crocodile, Cuban	Crocodylus rhombifer	Cuba
Crocodile, Nile	Crocodylus niloticus	Africa
Crocodile, saltwater (=estuarine)	Crocodylus porosus	Southeast Asia, Australia
Crocodile, Siamese	Crocodylus siamensis	Southeast Asia
Iguana, Cuban ground	Cyclura nubila nubila	Cuba
Lizard, Hierro giant	Gallotia simonyi simonyi	Spain (Canary Islands)
Lizard, Ibiza wall	Podarcis pityusensis	Spain (Balearic Islands)
Monitor, Bengal	Varanus bengalensis	Thailand
Turtle, green sea	Chelonia mydas (incl. agassizi)	Wherever found
Turtle, olive (=Pacific) ridley sea	Lepidochelys olivacea	Wherever found
Turtle, short-necked or western swamp	Pseudemydura umbrina	Australia

Table C13.T1. Endangered and Threatened Animals--Continued

Common Name	Scientific Name	OCONUS T&E Listed
Amphibians		
Frog, Panamanian golden	Atelopus varius zeteki	Panama
Salamander, Japanese giant	Andrias davidianus japonicus	Japan
Fishes		
Ala Balik (trout)	Salmo platycephalus	Turkey
Ayumodoki (loach)	Hymenophysa (=Botia) curta	Japan
Bonytongue, Asian	Scleropages formosus	Thailand
Catfish [no common name]	Pangasius sanitwongsei	Thailand
Catfish, giant	Pangasianodon gigas	Thailand
Cicek (minnow)	Acanthorutilus handlirschi	Turkey
Nekogigi (catfish)	Coreobagrus ichikawai	Japan
Tango, Miyako (Tokyo bitterling)	Tanakia tanago	Japan

Table C13.T2. Threatened and Endangered Plants

Common Name	Scientific Name	Historic Range
Flowering Plants		
Key tree-cactus	Pilosocereus (=Cereus) robinii	Cuba
Conifers and Cycads		
Pinabete or Guatemalan fir	Abies guatemalensis	Honduras

C14. CHAPTER 14

POLYCHLORINATED BIPHENYLS

C14.1. SCOPE

This Chapter contains criteria to control and abate threats to human health and the environment from the handling, use, storage and disposal of polychlorinated biphenyls (PCBs). These criteria include specific requirements for most uses of PCBs, including, but not limited to, transformers, capacitors, heat transfer systems, hydraulic systems, electromagnets, switches and voltage regulators, circuit breakers, reclosers and cables.

C14.2. DEFINITIONS

C14.2.1. Capacitor. A device for accumulating and holding a charge of electricity and consisting of conducting surfaces separated by a dielectric.

C14.2.2. Chemical-Waste Landfill. A landfill at which a high level of protection against risk of injury to human health or the environment from migration of deposited PCBs to land, water, or the atmosphere is provided by incorporating special methods for locating, engineering, and operating the landfill.

C14.2.3. In or Near Commercial Buildings. Within the interior of, on the roof of, attached to the exterior wall of, in the parking area serving, or within 30 meters of a non-industrial, non-substation building.

C14.2.4. Incinerator. An engineered device using controlled-flame combustion to thermally degrade PCBs and PCB items. Examples include rotary kilns, liquid-injection incinerators, cement kilns, and high-temperature boilers.

C14.2.5. Leak or Leaking. Any instance in which a PCB article, PCB container, or PCB equipment has any PCBs on any portion of its external surface.

C14.2.6. Mark. The descriptive name, instructions, cautions, or other information applied to PCBs and PCB items, or other objects subject to this Guide.

C14.2.7. Marked. PCB items and PCB storage areas and transport vehicles marked by applying a legible mark by painting, fixation of an adhesive label, or by any other method that meets these criteria.

C14.2.8. Non-PCB Transformers. Any transformer that contains less than 50 ppm PCB.

C14.2.9. PCB Article. Any manufactured article, other than a PCB container, that contains PCBs and whose surface(s) has been in direct contact with PCB. This includes capacitors, transformers, electric motors, pumps, and pipes.

C14.2.10. PCB Article Container. Any package, can, bottle, bag, barrel, drum, tank, or other device used to contain PCB articles or PCB equipment, and whose surface(s) has not been in direct contact with PCBs.

C14.2.11. PCB Container. Any package, can, bottle, bag, barrel, drum, tank, or other device that contains PCBs or PCB articles, and whose surface(s) has been in direct contact with PCBs.

C14.2.12. PCB-Contaminated Electrical Equipment. Any electrical equipment including, but not limited to, transformers, capacitors, circuit breakers, reclosers, voltage regulators, switches, electromagnets, and cable, that contain 50 ppm or greater PCB, but less than 500 ppm PCB.

C14.2.13. PCB Equipment. Any manufactured item, other than a PCB container or a PCB article container, which contains a PCB article or other PCB equipment, and includes microwave ovens, electronic equipment, and fluorescent light ballasts and fixtures.

C14.2.14. PCB Item. Any PCB article, PCB article container, PCB container, or PCB equipment that deliberately or unintentionally contains or has as a part of it any PCB, or PCBs at a concentration of 50 ppm or greater.

C14.2.15. PCB Transformer. Any transformer that contains 500 ppm PCB or greater.

C14.2.16. Restricted-Access Area. Areas where access by unauthorized personnel is controlled by fences, other man-made structures or naturally occurring barriers such as mountains, cliffs, or rough terrain.

C14.2.17. Substantial-Contact Area. An area that is subject to public access on a routine basis or that could result in substantial dermal contact by employees.

C14.2.18. PCB Large High-Voltage Capacitor. A capacitor that contains 1.36 kg (3 lbs) or more of dielectric fluid and that operates at 2,000 volts (alternating current (ac) or direct current (dc)) or above.

C14.2.19. PCB Large Low-Voltage Capacitor. A capacitor that contains 1.36 kg (3 lbs) or more of dielectric fluid and that operates below 2,000 volts (ac or dc).

C14.3. CRITERIA

C14.3.1. General

C14.3.1.1. The installation spill contingency plan will address PCB items, including, temporary storage items. Chapter 18, "Spill Prevention and Response Planning," provides criteria on how to prepare these plans.

C14.3.1.2. Spills of PCB liquids at concentrations of 50 ppm or greater will be responded to immediately upon discovery and cleaned up in accordance with the following:

C14.3.1.2.1. Surfaces that are located in substantial-contact areas will be cleaned to 10 micrograms per 100 square centimeters.

C14.3.1.2.2. Surfaces in all other contact areas will be cleaned to 100 micrograms per 100 square centimeters.

C14.3.1.2.3. Contaminated soil located in restricted-access areas will be removed until the soil tests no higher than 25 ppm PCBs and will be backfilled with clean soil containing less than 1 ppm PCBs. Restricted-access areas in which PCB spills have been cleaned up shall have annotated on installation real property records the level of PCBs remaining in the soil, including the extent, date and type of sampling and a reference to any reports documenting the site conditions.

C14.3.1.2.4. Contaminated soil located in unrestricted-access areas will be removed to a minimum depth of 10 inches or until the soil tests no higher than 10 ppm PCBs, whichever is deeper, and will be backfilled with clean soil containing less than 1 ppm PCBs.

C14.3.1.3. All PCB transformers, PCB large high-voltage capacitors, PCB containers, and certain PCB items containing PCBs at concentrations 50 ppm or greater (i.e., electric motors using PCB coolants, hydraulic systems using PCB hydraulic fluid, and heat-transfer systems using PCBs), as well as any PCB article containers used to store the preceding items, must be prominently marked in English and the host-nation language. The marking must identify the item as containing PCBs, warn against improper disposal and handling, and provide a phone number in case of spills or if questions arise about disposal. This marking criteria also applies to rooms, vaults, and storage areas containing PCB transformers or storing PCBs or PCB items for disposal. In addition, the following PCB items must be marked at the time of items' removal from use if not already marked: PCB large low-voltage capacitors and equipment containing a PCB transformer or PCB large high-voltage capacitor.

C14.3.1.4. Each installation having PCB items will maintain a written inventory that includes a current list by type of all marked PCB items in use and PCB items (whether or not marked) placed into storage for disposal or disposed of for that year. Inventory records should be maintained for a period of time at least 3 years after the last item on the list is disposed of.

C14.3.1.5. Disposal of PCB items will only be through the servicing DRMO in accordance with DoD 4160.21-M (reference (l)), or subsection C14.3.5., below.

C14.3.1.6. All periodic inspections as required in this Chapter will be documented at the installation. Records of inspections and maintenance history will be maintained for 3 years after disposal of the transformer.

C14.3.2. <u>PCB Transformers (500 ppm PCB or Greater)</u>

C14.3.2.1. PCB transformers that are in use or in storage for reuse will not be used in any application that poses a risk of contamination to food or feed.

C14.3.2.2. All PCB transformers, including those in storage for reuse, will be registered with the servicing fire department.

C14.3.2.3. PCB transformers in use in or near commercial buildings or located in sidewalk vaults will be equipped with electrical protection to minimize transformer failure that would result in the release of PCBs.

C14.3.2.4. PCB transformers removed and stored for reuse will only be returned to their original application and location and will not be used at another

location unless there is no practical alternative; and any such alternative use will not exceed 1 year.

C14.3.2.5. PCB transformers will be serviced as follows:

C14.3.2.5.1. Transformers classified as PCB-contaminated electrical equipment will only be serviced with dielectric fluid containing less than 500 ppm PCB;

C14.3.2.5.2. Any servicing of PCB transformers requiring removal of the transformer coil is prohibited;

C14.3.2.5.3. PCBs removed during servicing will be captured and either reused as dielectric fluid or disposed of in accordance with subsection C14.3.5. of this Chapter;

C14.3.2.5.4. PCB transformers may be serviced with dielectric fluid at any PCB concentration. However, the dielectric fluid from a PCB transformer will not be mixed with the dielectric fluid from PCB-contaminated electrical equipment;

C14.3.2.5.5. Regardless of PCB concentration, dielectric fluids containing less than 500 ppm PCB that are mixed with fluids that contain 500 ppm or greater PCB will not be used as dielectric fluid in any electrical equipment. The entire mixture must be considered to be greater than 500 ppm PCB; and

C14.3.2.5.6. Dielectric fluids containing 500 ppm or greater will not be used as dielectric fluid in any transformers classified as PCB-contaminated electrical equipment.

C14.3.2.6. All in-service PCB transformers (greater than 500 ppm) will be inspected at least every 3 months except that PCB transformers with impervious, undrained secondary-containment capacity of 100 percent of dielectric fluid or PCB transformers tested and found to contain less than 60,000 ppm PCBs will be inspected at least every 12 months.

C14.3.2.7. If any PCB transformer is involved in a fire such that it was subjected to heat and/or pressure sufficient to result in violent or nonviolent rupture, the installation will take measures to control water runoff, such as blocking floor drains. Runoff water will be tested and treated, if required.

C14.3.2.8. Repair or replace leaking PCB transformers within 48 hours or as

soon as possible. Leaking PCB transformers not repaired or replaced will be inspected daily. Leaking PCB fluid will be containerized.

C14.3.2.9. All transformers will be considered and treated as PCB transformers unless information to the contrary exists.

C14.3.3. Other PCB Items

C14.3.3.1. Electromagnets, switches, and voltage regulators that may contain PCBs at any concentration are serviced as follows:

C14.3.3.2. PCB-contaminated electrical equipment will only be serviced with dielectric fluid containing less than 500 ppm PCB;

C14.3.3.3. Servicing any electromagnet, switch, or voltage regulator with a PCB concentration of 500 ppm or greater, which requires the removal and rework of the internal components, is prohibited;

C14.3.3.4. PCBs removed during servicing will be captured and either reused as dielectric fluid or disposed of properly;

C14.3.3.5. PCBs from electromagnets, switches, and voltage regulators with a PCB concentration of 500 ppm or greater will not be mixed with or added to dielectric fluid from PCB-contaminated electrical equipment; and

C14.3.3.6. Dielectric fluids containing 500 ppm or greater will not be used as dielectric fluid in any electromagnet, switch, or voltage regulator classified as PCB-contaminated electrical equipment.

C14.3.3.7. Capacitors containing PCBs at any concentration must be managed as follows:

C14.3.3.7.1. Use and storage for reuse of PCB large high-voltage capacitors and PCB large low-voltage capacitors that pose an exposure risk to food or feed is prohibited;

C14.3.3.7.2. Use of PCB large high-voltage and PCB large low-voltage capacitors is prohibited unless the capacitor is used within a restricted-access electrical substation or in a contained and restricted-access indoor installation. The indoor installation will not have public access and will have an adequate roof, walls, and floor to contain any release of PCBs.

C14.3.3.8. Any PCB item removed from service will be marked with the date it is removed from service.

C14.3.4. Storage

C14.3.4.1. PCBs and PCB items at concentrations 50 ppm or greater that are to be stored before disposal will be stored in a facility that will assure the containment of PCBs, including:

C14.3.4.1.1. Roofs and walls of storage buildings that exclude rainfall;

C14.3.4.1.2. A containment berm, at least 6 inches high, sufficient to contain twice the internal volume of the largest PCB article or 25 percent of the total internal volume of all PCB articles or containers stored, whichever is greater;

C14.3.4.1.3. Drains, valves, floor drains, expansion joints, sewer lines or other openings constructed to prevent any release from the bermed area;

C14.3.4.1.4. Continuous, smooth and impervious flooring material; and

C14.3.4.1.5. To the maximum extent possible, a new PCB storage area will be located to minimize the risk of release due to seismic activity, floods, or other natural events. For facilities located where they may face such risks, the installation spill prevention and control plan will address the risk.

C14.3.4.2. The following items may be stored temporarily in an area, subject to weekly inspection, that does not comply with the above requirements for up to 30 days from the date of removal from service:

C14.3.4.2.1. Non-leaking PCB items, marked to indicate whether it is a PCB article or PCB equipment;

C14.3.4.2.2. Leaking PCB articles and PCB equipment placed in a non-leaking PCB container that contains sufficient absorbent material to absorb fluid contained on the PCB article or equipment;

C14.3.4.2.3. PCB containers in which non-liquid PCBs have been placed; or

C14.3.4.2.4. PCB containers in which PCBs at a concentration between 50-499 ppm have been placed and containers marked to indicate less than 500 ppm

PCB.

C14.3.4.3. Non-leaking and structurally undamaged large high-voltage PCB capacitors and PCB-contaminated electric equipment that have not been drained of free-flowing dielectric fluid may be stored on pallets, or raised platforms, next to a storage area meeting subsection C14.3.4. criteria if they are inspected weekly.

C14.3.4.4. All other PCB storage areas will be inspected at least monthly.

C14.3.4.5. Containers used for the storage of PCBs will be at least as secure as those required for their transport for disposal by the servicing DRMO.

C14.3.5. Disposal

C14.3.5.1. Installations that generate PCB waste of 50 ppm or greater PCB will maintain an audit trail for the wastes at least as stringent as that required under the criteria in Chapter 6. Installations will coordinate and obtain concurrence with the host nation for in-country PCB disposal as for hazardous waste disposal.

C14.3.5.2. PCB-contaminated dielectric fluid of concentrations of greater than 500 ppm will only be disposed of in an incinerator with 99.9 percent combustion efficiency.

C14.3.5.3. PCB-contaminated dielectric fluid of concentrations of 50 ppm or greater, but less than 500 ppm, will only be disposed of as follows:

C14.3.5.3.1. In an incinerator with 99.9 percent combustion efficiency; or

C14.3.5.3.2. In a high-efficiency boiler that is rated at a minimum of 50 MBtu/hr and that is fueled by natural gas, oil, or coal.

C14.3.5.4. Rags, soils and other debris contaminated with PCBs at concentrations of 50 ppm or greater will be disposed of:

C14.3.5.4.1. In an incinerator with 99.9 percent combustion efficiency; or

C14.3.5.4.2. In a chemical-waste landfill.

C14.3.5.5. PCB transformers will be disposed of:

C14.3.5.5.1. In an incinerator with 99.9 percent combustion efficiency; or

C14.3.5.5.2. In a chemical-waste landfill, provided the transformers, and all their inner workings, are first drained of all free-flowing liquids.

C14.3.5.6. PCB capacitors will be disposed of as follows:

C14.3.5.6.1. PCB capacitors will be disposed of in an incinerator with 99.9 percent combustion efficiency, except;

C14.3.5.6.2. Intact non-leaking small PCB capacitors may be disposed of in a solid-waste landfill unless large quantities (more than 100 pounds) are identified at the same time.

C14.3.5.7. PCB hydraulic machines containing PCBs may be disposed of as municipal solid waste if:

C14.3.5.7.1. The machine containing PCBs at concentrations of 50 ppm or greater is drained of all free-flowing liquid.

C14.3.5.7.2. The machine containing PCB liquid of 1,000 ppm or greater is flushed prior to disposal with a solvent containing less than 50 ppm PCB.

C14.3.5.8. PCB-contaminated electrical equipment, except capacitors, will be disposed of as municipal solid waste only after draining off all free-flowing liquid.

C14.3.5.9. PCB articles, other than those already described, will be disposed of:

C14.3.5.9.1. In an incinerator with 99.9 percent combustion efficiency; or

C14.3.5.9.2. In a chemical-waste landfill, provided the articles are first drained of all free-flowing liquids.

C14.3.5.10. PCB containers with concentrations of 500 ppm or greater may be disposed of:

C14.3.5.10.1. In an incinerator with 99.9 percent combustion efficiency; or

C14.3.5.10.2. In a chemical-waste landfill, provided the containers are first drained of all free-flowing liquids.

C14.3.5.11. Where PCB fluids, items or articles are disposed of in a high-temperature boiler, the following procedures will be followed:

C14.3.5.11.1. The boiler must be rated at a minimum of 50 million BTU hours;

C14.3.5.11.2. If the boiler uses natural gas or oil as the primary fuel, the carbon monoxide concentration in the stack must be 50 ppm or less and the excess oxygen is at least 3 percent when PCBs are being burned;

C14.3.5.11.3. If the boiler uses coal as the primary fuel, the carbon monoxide concentration in the stack is 100 ppm or less and the excess oxygen is at least 3 percent when PCBs are being burned;

C14.3.5.11.4. The mineral oil dielectric fluid does not comprise more than 10 percent, by volume, of the total fuel feed rate;

C14.3.5.11.5. The mineral oil dielectric fluid is not fed into the boiler unless the boiler is operating at its normal operating temperature and is not fed during start-up or shut-down operations;

C14.3.5.11.6. The performance of the boiler is continuously monitored for carbon monoxide and excess oxygen percentage in the stack gas while burning mineral oil dielectric fluid or, for boilers burning less than 112,500 liters (30,000 gallons) of mineral oil dielectric fluid per year, monitoring is performed at least every 60 minutes;

C14.3.5.11.7. The primary fuel feed rates, mineral oil dielectric fluid feed rates, and the total quantities of both primary fuel and mineral oil dielectric fluid fed to the boiler are measured and recorded at least every 15 minutes; and

C14.3.5.11.8. The flow of mineral oil dielectric fluid is stopped if the criteria respecting carbon monoxide or excess oxygen are exceeded.

C14.3.5.12. Where PCB fluids, items or articles are disposed of in an incinerator, the following procedures will be followed:

C14.3.5.12.1. Combustion criteria shall maintain the introduced liquids for a 2-second dwell time at 1,200°C, plus or minus 100°C (2,200°F +/- 212°F), and 3 percent excess oxygen in the stack gas or maintenance of the introduced liquids for a 1 - 1/2 second dwell time at 1,600°C, plus or minus 100°C (3,050°F +/- 212°F) and 2 percent excess oxygen in the stack gas;

C14.3.5.12.2. Combustion efficiency, measured by the ratio of the concentration of carbon dioxide to the total concentration of both carbon dioxide and carbon monoxide, will be maintained at least 99.9 percent;

C14.3.5.12.3. The rate and quantity of PCBs that are fed to the combustion system shall be measured and recorded at regular intervals not greater than 15 minutes;

C14.3.5.12.4. The temperatures of the incineration process shall be continuously measured and recorded;

C14.3.5.12.5. The flow of PCBs to the incinerator shall stop automatically if temperature criteria are not met;

C14.3.5.12.6. Monitoring is conducted sufficient to determine that an incinerator to be used for disposal the first time will operate within the criteria above; and

C14.3.5.12.7. Continuous monitoring is conducted during incineration of PCBs for oxygen and carbon monoxide and periodic monitoring for carbon dioxide.

C14.3.5.13. PCB containers used to contain only PCBs at a concentration less than 500 ppm may be disposed of as municipal solid waste only after draining off all free-flowing liquid.

C14.3.5.14. Retrogrades of PCB Items. DoD-generated PCB items manufactured in the U.S. will be returned to CONUS for delivery to a permitted disposal facility if host-country or third-country disposal is not possible, is prohibited or will not be managed in an environmentally sound manner. Ensure that all PCB items and equipment are marked in accordance with criteria in subsection C14.3.1.3., above.

C14.3.6. Elimination of PCB Products

C14.3.6.1. Installations shall minimize the use of PCBs and PCB items without degrading mission performance.

C14.3.6.2. Installations shall not purchase or otherwise take control of PCBs or PCB items for use.

C14.3.6.3. All procurement of transformers or any other equipment containing dielectric or hydraulic fluid shall be accompanied by a manufacturer's certification that the equipment contains no detectable PCBs (less than 2 ppm) at the time of shipment.

C14.3.6.4. Such newly procured transformers and equipment shall have permanent labels affixed stating they are PCB-free (no detectable PCBs).

C15. CHAPTER 15

ASBESTOS

C15.1. SCOPE

This Chapter contains criteria to control and abate threats to human health and the environment from asbestos, and describes management of asbestos during removal and disposal. Policy requirements for a comprehensive Occupational Health and Safety program are not covered in this Chapter. To protect personnel from asbestos exposure, refer to DoD Instruction 6055.1, "DoD Occupational Safety and Health Program," (reference (r)) and DoD Instruction 6055.5, "Industrial Hygiene and Occupational Health," (reference (s)) and concomitant Service instructions.

C15.2. DEFINITIONS

C15.2.1. Adequately Wet. Sufficiently mix or penetrate with liquid to prevent the release of particulates. If visible emissions are observed coming from ACM, then that material has not been adequately wetted. However, the absence of visible emissions is not sufficient evidence of being adequately wet.

C15.2.2. Asbestos. Generic term used to describe six distinctive varieties of fibrous mineral silicates, including chrysotile, amosite, crocidolite, tremolite asbestos, anthrophylite asbestos, actinolite asbestos, and any other of these materials that have been chemically treated and/or altered.

C15.2.3. Asbestos-Containing Material (ACM). Any material containing more than one percent asbestos by weight.

C15.2.4. Friable Asbestos. Any material containing more than one percent asbestos that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.

C15.3. CRITERIA

C15.3.1. Installations will appoint an asbestos program manager to serve as the single point of contact for all asbestos-related activities.

C15.3.2. Installations will prepare and implement an asbestos management plan. As a minimum, the plan will include the following:

C15.3.2.1. An ACM inventory, conducted by sample and analysis or visual determination;

C15.3.2.2. A notification and education program to tell workers, tenants, and building occupants where potentially friable ACM is located, and how and why to avoid disturbing the ACM; all persons affected should be properly informed;

C15.3.2.3. Regular ACM surveillance to note, assess, and document any changes in the ACM's condition;

C15.3.2.4. Work control/permit systems to control activities which might disturb ACM;

C15.3.2.5. Operations and maintenance (O&M) work practices to avoid or minimize fiber release during activities affecting ACM;

C15.3.2.6. Record keeping to document O&M activities related to asbestos identification management and abatement;

C15.3.2.7. Training for the asbestos program manager as well as custodial and maintenance staff;

C15.3.2.8. Procedures to assess and prioritize identified hazards for abatement; and

C15.3.2.9. Procedures to prevent the use of ACM in new construction.

C15.3.3. Prior to the demolition or renovation of a facility, the installation will make a determination whether or not the activity will remove or disturb ACM, and will record this determination on the project authorization document (e.g., work order).

C15.3.4. Prior to the demolition or renovation of a facility that involves removing or disturbing friable ACM, a written assessment of the action will be prepared and furnished to the installation commander. A copy of the assessment will also be kept on permanent file.

C15.3.5. Installations will remove friable ACM when it poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated.

C15.3.6. Before disturbing or demolishing a facility or part of a facility, installations will remove all friable ACM, and ACM with a high degree of probability of becoming friable once disturbed during demolition.

C15.3.7. When disposing of asbestos waste, installations will adequately wet all ACM waste, seal it in a leak proof container, and properly dispose of it in a municipal solid waste landfill as defined in Chapter 7. Containers will be labeled in English and the host-nation language: "DANGER - CONTAINS ASBESTOS FIBERS - AVOID CREATING DUST - CANCER AND LUNG DISEASE HAZARD." Permanent records documenting the disposal action and site will be maintained.

C15.3.8. DoD schools will comply with applicable requirements 15 U.S.C. 2643(l) (reference (t)) and implementing regulations in 40 CFR Part 763, Subpart E (reference (u)).

C16. CHAPTER 16

RADON--RESERVED

C16.1. RADON - RESERVED

C17. CHAPTER 17

LEAD-BASED PAINT

C17.1. SCOPE

This Chapter contains criteria to establish and implement a lead hazard management program to identify, control or eliminate lead-based paint hazards, through interim controls or abatement, in child-occupied facilities and military family housing, in a manner protective of human health and the environment. Policy requirements for a comprehensive Occupational Health and Safety program are not covered in this Chapter. To protect personnel from lead exposure, refer to DoD Instruction 6055.1, "DoD Occupational Safety and Health Program," (reference (r)) and DoD Instruction 6055.5, "Industrial Hygiene and Occupational Health" (reference (s)) and concomitant Service instructions.

C17.2. DEFINITIONS

C17.2.1. Abatement. Any set of measures designed to permanently eliminate lead-based paint or lead-based paint hazards. Abatement includes the removal of lead-based paint and lead-contaminated dust, the permanent enclosure or encapsulation of lead-based paint, the replacement of components or fixtures painted with lead-based paint, and the removal or covering of lead-contaminated soil. Abatement also includes all preparation, cleanup, disposal, and post-abatement clearance activities associated with such measures.

C17.2.2. Accessible Surface. An interior or exterior surface painted with lead-based paint that is accessible for a young child to mouth or chew.

C17.2.3. Bare Soil. Soil, including sand, not covered by grass, sod, or other live ground covers, or by wood chips, gravel, artificial turf, or similar covering.

C17.2.4. Child-Occupied Facility. A facility, or portion of a facility, visited regularly by the same child, 6 years of age or under, on at least two different days within any week, provided that each day's visit lasts at least 3 hours and the combined weekly visits last at least 6 hours, and the combined annual visits last at least 60 hours. Child-occupied facilities may include, but are not limited to, daycare centers, preschools, playgrounds, and kindergarten classrooms.

C17.2.5. Clearance. Visual evaluation and testing (collection and analysis of environmental samples) conducted after lead-based paint hazard reduction activities, interim controls, and standard treatments to determine that the work is complete and no lead-contaminated bare soil or lead-contaminated settled dust exists in a facility in which children under the age of 6 frequent.

C17.2.6. Deteriorated Paint. Any interior or exterior paint or other coating that is peeling, chipping, chalking, cracking or is otherwise damaged or separated from the substrate.

C17.2.7. Elevated Blood Lead Level. A confirmed concentration of lead in whole blood of 20 μg/dl (micrograms of lead per deciliter) for a single test, or of 15-19 μg/dl in two tests taken at least 3 months apart.

C17.2.8. Encapsulation. The application of any covering or coating that acts as a barrier between the lead-based paint and the environment. Encapsulation may be used as a method of abatement if it is designed to be permanent.

C17.2.9. Enclosure. The use of rigid, durable construction materials that are mechanically fastened to the substrate in order to act as a barrier between lead-based paint and the environment. Enclosure may be used as a method of abatement if it is designed to be permanent.

C17.2.10. Evaluation. A visual evaluation, risk assessment, risk-assessment screen, paint inspection, paint testing, or a combination of risk assessment and paint inspection to determine the presence of deteriorated paint, lead-based paint, or a lead-based paint hazard.

C17.2.11. Friction Surface. An interior or exterior surface that is subject to abrasion or friction, including but not limited to, window, floor, and stair surfaces.

C17.2.12. Hazard Reduction. Measures designed to reduce or eliminate human exposure to lead-based paint hazards through methods including interim controls or abatement or a combination of the two.

C17.2.13. Impact Surface. An interior or exterior surface that is subject to damage by repeated sudden force, such as certain parts of doorframes.

C17.2.14. Interim Controls. A set of measures designed to temporarily reduce human exposure or likely exposure to lead-based paint hazards. Interim controls

include, but are not limited to, repairs, occasional and ongoing maintenance, painting, temporary containment, specialized cleaning, clearance, ongoing activities, and the establishment and operation of management and resident education programs.

C17.2.15. Lead-Based Paint. Paint or other surface coatings that contain lead equal to or exceeding 1.0 milligram per square centimeter, or 0.5 percent by weight or 5,000 parts per million (ppm) by weight.

C17.2.16. Lead-Based Paint Hazard. Any condition that causes exposure to lead from lead-contaminated dust, lead-contaminated soil, or lead-contaminated paint that is deteriorated or present in accessible surfaces, friction surfaces, or impact surfaces, and that would result in adverse human health effects.

C17.2.17. Lead-Based Paint Inspection. A surface-by-surface investigation to determine the presence of lead-based paint and the provision of a report explaining the results of the investigation.

C17.2.18. Lead-Contaminated Dust. Surface dust that contains an area concentration of:

Surface Concentrations

Floors (m g/ft^2)	Interior Window Sills (m g/ft^2)	Window Troughs(m g/ft^2)
100	500	800

Notes:

1. "Floors" includes carpeted and uncarpeted floors.
2. For metric units, 1 µg/ft^2 = 0.01076 mg/sq.m.; thus 250 µg/ft^2 = 2.7 mg/sq.m., etc.

C17.2.19. Lead-Contaminated Soil. Bare soil containing lead at or exceeding a concentration of 400 ppm in high contact play areas, or 2000 ppm in areas where contact by children is less likely or frequent.

C17.2.20. Permanent. An expected design life of at least 20 years.

C17.2.21. Reevaluation. A visual evaluation of painted surfaces and limited dust and soil sampling conducted periodically following lead-based paint hazard reduction where lead-based paint is still present.

C17.2.22. Replacement. A strategy of abatement that entails removing building components that have surfaces coated with lead-based paint (such as windows, doors, and trim) and installing new components free of lead-based paint.

C17.2.23. Risk Assessment. An on-site investigation to determine the existence,

nature, severity, and location of lead-based paint hazards and the provision of a report explaining the results of the investigation and options for reducing lead-based paint hazards.

C17.2.24. Risk-Assessment Screen. A sampling protocol that is used in dwellings that are in relatively good condition and where the probability of finding lead-based hazards are low. The protocol involves inspecting such dwellings and collecting samples from representative locations on the floor, interior window sills, and window troughs to determine whether conducting a risk assessment is warranted.

C17.3. CRITERIA

C17.3.1. Installations will:

C17.3.1.1. Develop and implement a multi-disciplinary lead-based paint hazard management program to identify, evaluate, and reduce lead-based paint hazards in child-occupied facilities and military family housing.

C17.3.1.2. Manage identified lead-based paint hazards through interim controls or abatement.

C17.3.1.3. Identify lead-based paint hazards in child-occupied facilities and military family housing using any or all of the following methods:

C17.3.1.3.1. Lead-based paint risk assessment screen. If screen identifies dust-lead levels >50 $\mu g/ft^2$ for floors, 250 $\mu g/ft^2$ for interior window sills, or 400 $\mu g/ft^2$ for window troughs, perform lead-based paint risk assessment.

C17.3.1.3.2. Lead-based paint risk assessments.

C17.3.1.3.3. Routine facility inspection for fire and safety.

C17.3.1.3.4. Occupant, facility manager, and worker reports of deteriorated paint.

C17.3.1.3.5. Results of childhood blood lead screening or reports of children identified to have elevated blood lead levels.

C17.3.1.3.6. Lead-based paint reevaluations.

C17.3.1.3.7. Review of construction, painting, and maintenance histories.

C17.3.1.4. Ensure occupants and worker protection measures are taken during all maintenance, repair, and renovation activities that disturb areas known or assumed to have lead-based paint.

C17.3.1.5. Disclose to occupants of child-occupied facilities and military family housing the presence of any known lead-based paint or lead-based paint hazards and provide information on lead-base paint hazard reduction. In addition, inform occupants of military family housing, prior to conducting remodeling or renovation projects, of the hazards associated with these activities, and provide information on protecting family members from the hazards of lead-based paint.

C17.3.1.6. Ensure that all personnel involved in lead-based activities, including paint inspection, risk assessment, specification or design, supervision, and abatement, are properly trained.

C17.3.1.7. Dispose of lead-contaminated waste that meets the definition of a hazardous waste (subsection C6.2.5.) in accordance with Chapter 6.

C18. CHAPTER 18

SPILL PREVENTION AND RESPONSE PLANNING

C18.1. SCOPE

This Chapter contains criteria to plan for, prevent, control and report spills of POL and hazardous substances. It is DoD policy to prevent spills of these substances due to DoD activities and to provide for prompt, coordinated response to contain and clean up spills that might occur. Remediation beyond that required for the initial response is conducted pursuant to DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas" (reference (v)).

C18.2. DEFINITIONS

C18.2.1. Hazardous Substance. Any substance having the potential to do serious harm to human health or the environment if spilled or released in reportable quantity. A list of these substances and the corresponding reportable quantities is contained in Appendix 1. The term does not include:

C18.2.1.1. Petroleum, including crude POL or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous substance above.

C18.2.1.2. Natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

C18.2.2. Facility Incident Commander (FIC) (previously known as the Installation On-scene Coordinator). The official who coordinates and directs DoD control and cleanup efforts at the scene of a POL or hazardous substance spill due to DoD activities on or near the installation. This official is designated by the installation commander.

C18.2.3. Facility Response Team (previously known as the Installation Response Team) (FRT). A team performing emergency functions as defined and directed by the FIC.

C18.2.4. Oil. POL of any kind or in any form, including, but not limited to, petroleum, fuel POL, sludge, POL refuse and POL mixed with wastes other than dredged spoil.

C18.2.5. POL. Refined petroleum, oils, and lubricants.

C18.2.6. Significant spill. An uncontained release to the land or water in excess of any of the following quantities:

C18.2.6.1. For hazardous waste or hazardous substance identified as a result of inclusion in Table AP1.T4., any quantity in excess of the reportable quantity listed in Table AP1.T4.;

C18.2.6.2. For POL or liquid or semi-liquid hazardous material, hazardous waste or hazardous substance, in excess of 400 liters (110 gallons);

C18.2.6.3. For other solid hazardous material, in excess of 225 Kg (500 pounds); or

C18.2.6.4. For combinations of POL and liquid, semi-liquid and solid hazardous materials, hazardous waste or hazardous substance, in excess of 340 Kg (750 pounds).

C18.2.6.5. If a spill is contained inside an impervious berm, or on a nonporous surface, or inside a building and is not volatilized and is cleaned up, the spill is considered a contained release and is not considered a significant spill.

C18.2.7. Worst-Case Discharge. The largest foreseeable discharge from the facility, under adverse weather conditions, as determined using as a guide the worst-case discharge planning volume criteria at Appendix 2.

C18.3. CRITERIA

C18.3.1. Plan Requirement. All DoD installations will prepare, maintain and implement a Spill Prevention and Response Plan that provides for the prevention, control and reporting of all spills of POL and hazardous substances. The plan will provide measures to prevent, and to the maximum extent practicable, to remove a worst-case discharge from the facility. The plan will be updated at least every 5 years or when there are significant changes to operations. The plan should be kept in a location easily accessible to the FIC and FRT.

C18.3.2. Prevention Section. The prevention section of the plan will, as a minimum, contain the following:

C18.3.2.1. Name, title, responsibilities, duties and telephone number of the designated FIC and an alternate.

C18.3.2.2. General information on the installation including name, type or function, location and address, charts of drainage patterns, designated water protection areas, maps showing locations of facilities described in paragraph C18.3.2.3., below, critical water resources, land uses and possible migration pathways.

C18.3.2.3. An inventory of storage, handling and transfer sites that could possibly produce a significant spill. For each listing, using maps as appropriate include a prediction of the direction and rate of flow, and total quantity of POL or hazardous substance that might be spilled as a result of a major failure.

C18.3.2.4. An inventory of all POL and hazardous substances at storage, handling and transfer facilities described in paragraph C18.3.2.3., above.

C18.3.2.5. Arrangements for Emergency Services. The plan will describe arrangements with installation and/or local police departments, fire departments, hospitals, contractors and emergency response teams to coordinate emergency services.

C18.3.2.6. Means to Contact Emergency Services. The plan will include a telephone number or other means to contact the appropriate emergency service provider (e.g., base fire department) on a 24-hour basis.

C18.3.2.7. A detailed description of the facility's prevention, control and countermeasures, including structures and equipment for diversion and containment of spills, for each site listed in the inventory. Measures should permit, as far as practical, reclamation of spilled substances. Chapters governing hazardous materials, hazardous waste, POL, underground storage tanks, pesticides and PCBs provide specific criteria for containment structure requirements.

C18.3.2.8. A list of all emergency equipment (such as fire extinguishing systems, spill-control equipment, communications and alarm systems (internal and external) and decontamination equipment) at each site listed in the inventory where this equipment is required. This list will be kept up to date. In addition, the plan will include the location and a physical description of each item on the list, and a brief outline of its capabilities.

C18.3.2.9. An evacuation plan for each site listed in the inventory, where there is a possibility that evacuation would be necessary. This plan will describe

signal(s) to be used to begin evacuation, evacuation routes, alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires), and a designated meeting place.

C18.3.2.10. A description of deficiencies in spill prevention and control measures at each site listed in the inventory, to include corrective measures required, procedures to be followed to correct listed deficiencies and any interim control measures in place. Corrective actions must be implemented within 24 months of the date of plan preparation or revision.

C18.3.2.11. Written procedures for:

C18.3.2.11.1. Operations to preclude spills of POL and hazardous substances;

C18.3.2.11.2. Inspections; and

C18.3.2.11.3. Recordkeeping requirements.

C18.3.2.12. Site-specific procedures should be maintained at each site on the facility where significant spills could occur.

C18.3.3. Spill Control Section. The control section of the plan (that may be considered a contingency plan) will identify resources for cleaning up spills at installations and activities, and to provide assistance to other agencies when requested. As a minimum, this section will contain:

C18.3.3.1. Provisions specifying the responsibilities, duties, procedures and resources to be used to contain and clean up spills.

C18.3.3.2. A description of immediate response actions that should be taken when a spill is first discovered.

C18.3.3.3. The responsibilities, composition, and training requirements of the FRT.

C18.3.3.4. Procedures for FRT alert and response to include provisions for:

C18.3.3.4.1. Access to a reliable communications system for timely notification of a POL spill or hazardous substance spill.

C18.3.3.4.2. Public affairs involvement.

C18.3.3.5. A current roster of the persons, and alternates, who must receive notice of a POL or hazardous substance spill, including a DESC representative if applicable. The roster will include name, organization mailing address, and work and home telephone number. Without compromising security, the plan will include provisions for the notification of the emergency coordinator after normal working hours.

C18.3.3.6. The plan will provide for the notification of the FIC, installation commander and local authorities in the event of hazard to human health or environment.

C18.3.3.7. Assignment of responsibilities for making the necessary notifications including notification to the emergency services providers.

C18.3.3.8. Surveillance procedures for early detection of POL and hazardous substance spills.

C18.3.3.9. A prioritized list of various critical water and natural resources that will be protected in the event of a spill.

C18.3.3.10. Other resources addressed in prearranged agreements that are available to the installation to clean up or reclaim a large spill due to DoD activities, if such spill exceeds the response capability of the installation.

C18.3.3.11. Cleanup methods, including procedures and techniques used to identify, contain, disperse, reclaim and remove POL and hazardous substances used in bulk quantity on the installation.

C18.3.3.12. Procedures for the proper reuse and disposal of recovered substances, contaminated POL and absorbent materials, and procedures to be accomplished prior to resumption of operations.

C18.3.3.13. A description of general health, safety and fire-prevention precautions for spill-cleanup actions.

C18.3.3.14. A public affairs section that describes the procedures, responsibilities, and methods for releasing information in the event of a spill.

C18.3.4. Reporting Section. The reporting section of the plan will address the following:

C18.3.4.1. Recordkeeping when emergency procedures are invoked.

C18.3.4.2. Any significant spill will be reported to the FIC immediately. Immediate actions will be taken to eliminate the source and contain the spill.

C18.3.4.3. The FIC will immediately notify the appropriate In-Theater Component Commander and/or Defense Agency and the executive agent and submit a follow-up written report when:

C18.3.4.3.1. The spill occurs inside a DoD installation and cannot be contained within any required berm or secondary containment; or

C18.3.4.3.2. The spill exceeds 400 liters (110 gallons) of POL; or

C18.3.4.3.3. A water resource has been polluted; or

C18.3.4.3.4. The FIC has determined that the spill is significant.

C18.3.4.4. When a significant spill occurs inside a DoD installation and cannot be contained within the installation boundaries or threatens the local host-nation drinking water resource, the appropriate In-Theater Component Commander and/or Defense Agency, executive agent and host-nation authorities will be notified immediately.

C18.3.4.5. If a significant spill occurs outside of a DoD installation, the person in charge at the scene will immediately notify the authorities listed in C18.3.4.4., above, and additionally will notify the local fire departments and obtain necessary assistance.

C18.3.5. Installations will provide necessary training and spill response drills to ensure the effectiveness of personnel and equipment.

C18.3.6. After completion of the initial response, any remaining free product and/or obviously contaminated soil will be appropriately removed and managed. Further action will be governed by DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas" (reference (v)).

C19. CHAPTER 19

UNDERGROUND STORAGE TANKS

C19.1. SCOPE

This Chapter contains criteria to control and abate pollution resulting from POL products and hazardous materials stored in underground storage tanks (USTs). Standards for USTs containing hazardous wastes are covered in Chapter 6.

C19.2. DEFINITIONS

C19.2.1. POL. Refined petroleum, oils and lubricants.

C19.2.2. Hazardous Material. Any material defined as a hazardous material in Chapter 5. The term does not include:

C19.2.2.1. Petroleum, including crude POL or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous material above.

C19.2.2.2. Natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

C19.2.3. Tank-Tightness Testing. A test that must be capable of detecting a 0.38 liter (0.1 gallon) per hour leak from any portion of the tank that routinely contains product while accounting for the effects of thermal expansion or contraction of the product, vapor pockets, tank deformation, evaporation or condensation, and the location of the water table.

C19.2.4. Underground Storage Tank (UST). Any tank including underground piping connected thereto, larger than 416 liters (110 gallons), that is used to contain POL products or hazardous material and the volume of which, including the volume of connected pipes, is 10 percent or more beneath the surface of the ground, but does not include:

C19.2.4.1. Tanks containing heating oil used for consumption on the premises where it is stored;

C19.2.4.2. Septic tanks;

C19.2.4.3. Stormwater or wastewater collection systems;

C19.2.4.4. Flow-through process tanks;

C19.2.4.5. Surface impoundments, pits, ponds or lagoons;

C19.2.4.6. Field-constructed tanks; or

C19.2.4.7. Hydrant fueling systems.

C19.2.4.8. Storage tanks located in an accessible underground area (such as a basement or vault) if the storage tank is situated upon or above the surface of the floor.

C19.2.4.9. UST containing *de minimis* concentrations of regulated substances, except where paragraph C19.3.3.3. is applicable.

C19.2.4.10. Emergency spill or overflow containment UST systems that are expeditiously emptied after use.

C19.2.5. New UST. Any UST installed on or after October 1, 1994.

C19.2.6. Hazardous Material UST. A UST that contains a hazardous material (but not including hazardous waste as defined in Chapter 6) or any mixture of such hazardous materials, and petroleum, and which is not a petroleum UST.

C19.3. CRITERIA

C19.3.1. All installations will maintain a UST inventory.

C19.3.2. New POL USTs. All new petroleum UST systems will be properly installed, protected from corrosion, provided with spill/overfill prevention and will incorporate leak detection as described below:

C19.3.2.1. Corrosion Protection. New tanks and piping must be provided with corrosion protection unless constructed of fiberglass or other non-corrodible materials. The corrosion protection system must be certified by competent authority.

C19.3.2.2. Spill/Overflow Protection. New USTs will be provided with spill and over-fill prevention equipment, except where transfers are made in the amounts of 95 liters (25 gallons) or less. Where spill and over-fill protection are

required, a spill containment box must be installed around the fillpipe. Over-fill prevention will be provided by one of the following methods:

C19.3.2.2.1. Automatic shut-off device (set at 95 percent of tank capacity).

C19.3.2.2.2. High-level alarm (set at 90 percent of tank capacity).

C19.3.2.3. Leak Detection. Leak-detection systems must be capable of detecting a 0.38 liter (0.1 gallon) per hour leak rate or a release of 568 liters (150 gallons) (or one percent of tank volume, whichever is less) within 30 days with a probability of detection of 0.95 and a probability of false alarm of not more than 0.05.

C19.3.2.3.1. New USTs will use at least one of the following leak detection methods:

C19.3.2.3.1.1. Automatic tank gauging;

C19.3.2.3.1.2. Vapor monitoring;

C19.3.2.3.1.3. Groundwater monitoring; or

C19.3.2.3.1.4. Interstitial monitoring.

C19.3.2.3.2. All new pressurized UST piping must be equipped with automatic line leak detectors and utilize either an annual tightness test or monthly monitoring.

C19.3.2.3.3. Suction piping will either have a line tightness test conducted every 3 years or use monthly monitoring.

C19.3.3. Existing POL USTs. Existing POL USTs and piping will be properly closed if not needed or be upgraded or replaced to meet new UST system requirements as indicated in subsection C19.3.2. by October 1, 2004.

C19.3.3.1. Existing UST and piping not incorporating leak detection will be tightness tested annually in accordance with recognized U.S. Industry standards and inventoried monthly to determine system tightness.

C19.3.3.2. All existing leaking UST will be immediately removed from service. If the UST is still required, it will be repaired or replaced. If the UST is no longer required it will be removed from the ground. When a leaking UST is removed,

exposed free product and/or obviously contaminated soil in the immediate vicinity of the tank will be appropriately removed and managed. Additional action will be governed by DoD Instruction 4715.8, "Environmental Remediation for DoD Activities Overseas" (reference (v)). Under extenuating circumstances (e.g., where the UST is located under a building), the UST will be cleaned and filled with an inert substance, and left in place.

C19.3.3.3. When a UST has not been used for 1 year, all of the product and sludges must be removed. Subsequently, the tank must be either cleaned and filled with an inert substance, or removed. Tank wastes must be tested in accordance with subsection C9.3.3., above.

C19.3.4. New Hazardous Material USTs

C19.3.4.1. All new hazardous material USTs and piping must meet the same design and construction standards as required for new petroleum USTs and piping, and in addition, must be provided with secondary containment for both tank and piping. Secondary containment can be met by using double-walled tanks and piping, liners, or vaults.

C19.3.4.2. Leak Detection. The interstitial space (space between the primary and secondary containment) for tanks and piping must be monitored monthly for liquids or vapors.

C19.3.5. Existing Hazardous Material USTs

C19.3.5.1. Existing hazardous material tanks and piping will be upgraded or replaced to meet the new hazardous material tanks and piping requirements indicated in paragraph C19.3.4., above, by January 1, 1999.

C19.3.5.2. Existing tanks and piping not incorporating leak detection will be tightness tested annually and inventoried monthly.

AP1. APPENDIX 1

CHARACTERISTICS OF HAZARDOUS WASTES AND LISTS OF HAZARDOUS WASTES AND HAZARDOUS MATERIALS

AP1.1. CHARACTERISTICS OF HAZARDOUS WASTE

AP1.1.1. General

AP1.1.1.1. A solid waste is a discarded material that may be solid, semi-solid, liquid, or contained gas.

AP1.1.1.2. A solid waste becomes a hazardous waste when it exhibits a characteristic of a hazardous waste or is listed as a hazardous waste in this Appendix.

AP1.1.1.3. Each hazardous waste is identified by a USEPA Hazardous Waste Number (HW#). A characteristic waste is assigned every USEPA HW# that is applicable. The HW# must be used in complying with the notification, recordkeeping, and reporting requirements.

AP1.1.2. Characteristic of Ignitability

AP1.1.2.1. A solid waste exhibits the characteristic of ignitability if a representative sample of the waste has any of the following properties:

AP1.1.2.1.1. It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has a flash point less than 60°C (140°F), as determined by a Pensky-Martens Closed Cup Tester, using the test method specified in ASTM Standard D-93-79 or D-93-80 or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D-3278-78 or as determined by an equivalent test method.

AP1.1.2.1.2. It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

AP1.1.2.1.3. It is an ignitable compressed gas as determined by appropriate test methods or USEPA.

AP1.1.2.1.4. It is an oxidizer.

AP1.1.2.2. A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

AP1.1.3. Characteristic of Corrosivity

AP1.1.3.1. A solid waste exhibits the characteristic of corrosivity if a representative sample of the waste has either of the following properties:

AP1.1.3.1.1. It is aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter.

AP1.1.3.1.2. It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F) as determined by the test method specified in NACE (National Association of Corrosion Engineers) Standard TM-01-69 as standardized in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods."

AP1.1.3.2. A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

AP1.1.4. Characteristic of Reactivity

AP1.1.4.1. A solid waste exhibits the characteristic of reactivity if a representative sample of the waste has any of the following properties:

AP1.1.4.1.1. It is normally unstable and readily undergoes violent change without detonating.

AP1.1.4.1.2. It reacts violently with water.

AP1.1.4.1.3. It forms potentially explosive mixtures with water.

AP1.1.4.1.4. When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

AP1.1.4.1.5. It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

AP1.1.4.1.6. It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

AP1.1.4.1.7. It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

AP1.1.4.1.8. It is a forbidden explosive.

AP1.1.4.2. A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

AP1.1.5. Toxicity Characteristic

AP1.1.5.1. A solid waste exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, the extract from a representative sample of the waste contains any of the contaminants listed in Table AP1.T1. or AP1.1. of this Appendix, at the concentration equal to or greater than the respective value given in that Table. Where the waste contains less than 0.5 percent filterable solids, the waste itself is considered to be the extract for the purpose of this section.

AP1.1.5.2. A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table AP1.T1. or section AP1.2., which corresponds to the toxic contaminant causing it to be hazardous.

AP1.2. LISTS OF HAZARDOUS WASTES

AP1.2.1. General

AP1.2.1.1. A solid waste is a hazardous waste if it is listed in this section.

AP1.2.1.2. The basis for listing the classes or types of wastes listed employed one or more of the following Hazard Codes:

Ignitable Waste	(I)
Corrosive Waste	(C)
Reactive Waste	(R)
Toxicity Characteristic Waste	(E)
Acute Hazardous Waste	(H)
Toxic Waste	(T)

AP1.2.1.3. Each hazardous waste listed in section AP1.2. of this Appendix is assigned a USEPA Hazardous Waste Number, which precedes the name of the waste. This number must be used in complying with the notification, recordkeeping and reporting requirements of these alternate standards.

AP1.2.2. Hazardous Wastes from Non-Specific Sources. The solid wastes in Table AP1.T3. are listed hazardous wastes from non-specific sources. These hazardous wastes are designated with an "F."

AP1.2.3. The solid wastes listed in Table AP1.T4., annotated "K" as the first character of the USEPA HW Number column, are listed hazardous wastes from specific sources.

AP1.2.4. Discarded Commercial Chemical Products, Off-Specification Species, Container Residues, and Spill Residues Thereof

AP1.2.4.1. The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded when they are mixed with waste oil or used oil or other material and applied to the land for dust suppression or road treatment, when they are otherwise applied to the land in lieu of their original intended use or when they are contained in products that are applied to the land in lieu of their original intended use, or when, in lieu of their original intended use, they are produced for use as (or as a component of) a fuel, distributed for use as a fuel, or burned as a fuel.

AP1.2.4.1.1. Any commercial chemical product, or manufacturing chemical intermediate having the generic name listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number.

AP1.2.4.1.1.1. Any off-specification commercial chemical product or manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number.

AP1.2.4.1.1.2. Any residue remaining in a container or in an inner liner removed from a container that has held any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number, unless the container is empty. [Comment: Unless the residue is being beneficially used or reused, or legitimately recycled or reclaimed; or being accumulated, stored, transported

or treated prior to such use, re-use, recycling or reclamation, the residue to be intended for discard, and thus, a hazardous waste. An example of a legitimate re-use of the residue would be where the residue remains in the container and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.]

AP1.2.4.1.1.3. Any residue or contaminated soil, water or other debris resulting from the cleanup of a spill into or on any land or water of any commercial chemical product or manufacturing chemical intermediate having the generic name listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number, or any residue or contaminated soil, water or other debris resulting from the cleanup of a spill, into or on any land or water, of any off-specification chemical product and manufacturing chemical intermediate which, if it met specifications, would have the generic name listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number of this section. [Comment: The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in..." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use whicht consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number. Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in Table AP1.T4., annotated "P" or "U" as the first character in the USEPA waste number, such waste will be listed in paragraph AP1.2.2., above, or will be identified as a hazardous waste by the characteristics set forth in section AP1.1. of this Appendix.]

AP1.2.4.1.1.4. The commercial chemical products, manufacturing chemical intermediates or off-specification commercial chemical products or manufacturing chemical intermediates referred to in Table AP1.T4., annotated "P" as the first character in the USEPA waste number are hereby identified as acute hazardous wastes (H). [Comment: For the convenience of the regulated community the primary hazardous properties of these materials have been indicated by the letters T (Toxicity), and R (Reactivity). Absence of a letter indicates that the compound only is listed for acute toxicity.] These wastes and their corresponding USEPA Hazardous Waste Numbers are listed in Table AP1.T4., annotated "P" as the first character in the USEPA waste number.

AP1.2.4.1.1.5. The commercial chemical products, manufacturing chemical intermediates, or off-specification commercial chemical products referred to in Table AP1.T4., subparagraphs AP1.2.4.1.1.1. through AP1.2.4.1.1.3. of this section, are hereby identified as toxic wastes (T), unless otherwise designated. [Comment: For the convenience of the regulated community, the primary hazardous properties of these materials have been indicated by the letter T (Toxicity), R (Reactivity), I (Ignitability), and C (Corrosivity). Absence of a letter indicates that the compound is only listed for toxicity.]

Table AP1.T1. Maximum Concentration of Contaminants for the Toxicity Characteristic

USEPA HW No.[1]	Contaminant	CAS No. [2]	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D006	Cadmium	7440-43-2	1.0
D007	Chromium	7440-47-3	5.0
D016	2,4-D	94-75-7	10.0
D012	Endrin	72-20-8	0.02
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D015	Toxaphene	8001-35-2	0.5
D017	2,4,5-TP (Silvex)	93-72-1	1.0

Table AP1.T2. Maximum Concentration of Contaminants for Non-Wastewater

USEPA HW No.[1]	Contaminant	CAS No. [2]	Regulatory Level (mg/L)
D018	Benzene	71-43-2	0.5
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0
D023	o-Cresol	95-48-7	200.0
D024	m-Cresol	108-39-4	200.0
D025	p-Cresol	106-44-5	200.0
D026	Cresol		200.0
D027	1,4-Dichlorobenzene	106-46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	121-14-2	0.13
D031	Heptachlor (and its epoxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	0.13
DO33	Hexachlorobutadiene	87-68-3	0.5
DO34	Hexachloroethane	67-72-1	3.0
DO35	Methyl Ethyl Ketone	78-93-3	200.0
DO36	Nitrobenzene	98-95-3	2.0
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D040	Trichloroethylene	79-01-6	0.5
D041	2,4,5-Trichlorophenol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0
D043	Vinyl Chloride	75-01-4	0.2

Notes

1. U.S. EPA Hazardous Waste number.
2. Chemical Abstracts Service number.

Table AP1.T3. Listed Hazardous Wastes from Non-Specific Sources

USEPA HW No.[1]	Hazardous Waste	Hazard Code
F001	The following spent halogenated solvents used in degreasing: Tetrachloroethylene, trichloroethylene, methylene chloride, 1,1,1-trichloroethane, carbon tetrachloride, and chlorinated fluorocarbons; all spent solvent mixtures/blends used in degreasing containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F002	The following spend halogenated solvents: Tetrachloroethylene, methylene chloride, trichloroethylene, 1,1,1-trichloroethane, chlorobenzene, 1,1,2-trichloro-1,2,2-trifluoroethane, ortho-dichlorobenzene, trichlorofluoromethane, and 1,1,2-trichloroethane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F003	The following spent non-halogenated solvents: xylene, acetone, ethyl acetate, ethyl benzene, ethyl ether, methyl isobutyl ketone, n-butyl alcohol, cyclohexanone, and methanol; all spent solvent mixtures/blends containing, before use, only the above spent non-halogenated solvents; and all spent solvent mixtures/blends containing, before use, one or more of the above non-halogenated solvents, and, a total of ten percent or more (by volume) of one or more of those solvents listed in F001, F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I)[2]
F004	The following spent non-halogenated solvents: Cresols and cresylic acid, and nitrobenzene; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(T)
F005	The following spent non-halogenated solvents: Toluene, methyl ethyl ketone, carbon disulfide, isobutanol, pyridine, benzene, 2-ethoxyethanol, and 2-nitropropane; all spent solvent mixtures/blends containing, before use, a total of ten percent or more (by volume) of one or more of the above non-halogenated solvents or those solvents listed in F001, F002, or F004; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.	(I,T)
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	(T)
F007	Spent cyanide plating bath solutions from electroplating operations.	(R,T)
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	(R,T)
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	(R,T)
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	(R,T)
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	(R,T)
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	(T)

Table AP1.T3. Listed Hazardous Wastes from Non-Specific Sources--Continued

USEPA HW No.[1]	Hazardous Waste	Hazard Code
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusion conversion coating process.	(T)
F020	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives (This listing does not include wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol).	(H)
F021	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.	(H)
F022	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.	(H)
F023	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols (This listing does not include wastes from equipment used only for the production or use of Hexachlorophene from highly purified 2,4,5-trichlorophenol).	(H)
F024	Process wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in Sec 26131 or Sec 26132).	(T)
F025	Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.	(T)
F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzene under alkaline conditions.	(H)
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols (This listing does not include formulations containing Hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component).	(H)
F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Numbers F020, F021, F022, F023, F026, and F027.	(T)

Table AP1.T3. Listed Hazardous Wastes from Non-Specific Sources--Continued

USEPA HW No.[1]	Hazardous Waste	Hazard Code
F032	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with Sec 26135 of this chapter or potentially cross- contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
F034	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
F035	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
F037	Petroleum refinery primary oil/water/solids separation sludge-Any sludge generated from the gravitational separation of oil/water/ solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/ solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in Sec 26131(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing.	(T)
F038	Petroleum refinery secondary (emulsified) oil/water/solids separation sludge -- Any sludge and/or float generated from the physical and/or chemical separation of oil/water/ solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges and floats generated in aggressive biological treatment units as defined in Sec 26131(b)(2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing.	(T)

Table AP1.T3. Listed Hazardous Wastes from Non-Specific Sources--Continued

USEPA HW No.[1]	Hazardous Waste	Hazard Code
F039	Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under subpart D of this part (Leachate resulting from the disposal of one or more of the following EPA Hazardous Wastes and no other Hazardous Wastes retains its EPA Hazardous Waste Number(s): F020, F021, F022, F026, F027, and/or F028)	(T)

Notes

1. U.S. EPA Hazardous Waste number.
2. (I,T) should be used to specify mixtures containing ignitable and toxic constituents.

Table AP1.T4. List of Hazardous Waste/Substances/Materials (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Acenaphthene	83329			100
Acenaphthylene	208968			5,000
Acetaldehyde (I)	75070		U001	1,000
Acetaldehyde, chloro-	107200		P023	1,000
Acetaldehyde, trichloro-	75876		U034	5,000
Acetamide	60355			100
Acetamide, N-(aminothioxomethyl)-	591082		P002	1,000
Acetamide, N-(4-ethoxyphenyl)-	62442		U187	100
Acetamide, 2-fluoro-	640197		P057	100
Acetamide, N-9H-fluoren-2-yl-	53963		U005	1
Acetic acid	64197			5,000
Acetic acid (2,4-dichlorophenoxy)-salts and esters	94757		U240	100
Acetic acid, lead(2+) salt	301042		U144	10
Acetic acid, thallium(1+) salt	563688		U214	1000
Acetic acid, (2,4,5-trichlorophenoxy)	93765		U232	1,000
Acetic acid, ethyl ester (I)	141786		U112	5,000
Acetic acid, fluoro-, sodium salt	62748		P058	10
Acetic anhydride	108247			5,000
Acetone (I)	67641		U002	5,000
Acetone cyanohydrin	75865	1,000	P069	10
Acetone thiosemicarbazide	1752303	1,000/10,000		1
Acetonitrile (I,T)	75058		U003	5,000
Acetophenone	98862		U004	5,000
2-Acetylaminofluorene	53963		U005	1
Acetyl bromide	506967			5,000
Acetyl chloride (C,R,T)	75365		U006	5,000
1-Acetyl-2-thiourea	591082		P002	1
Acrolein	107028	500	P003	1
Acrylamide	79061	1,000/10,000	U007	5,000
Acrylic acid (I)	79107		U008	5,000
Acrylonitrile	107131	10,000	U009	100
Acrylyl chloride	814686	100		1
Adipic acid	124049			5,000
Adiponitrile	111693	1,000		1
Aldicarb	116063	100/10,000	P070	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Aldrin	309002	500/10,000	P004	1
Allyl alcohol	107186	1,000	P005	100
Allylamine	107119	500		1
Allyl chloride	107051			1,000
Aluminum phosphide (R,T)	20859738	500	P006	100
Aluminum sulfate	10043013			5,000
4-Aminobiphenyl	92671			1
5-(Aminomethyl)-3-isoxazolol	2763964		P007	1,000
Aminopterin	54626	500/10,000		1
4-Aminopyridine	504245		P008	1,000
Amiton	78535	500		1
Amiton oxalate	3734972	100/10,000		1
Amitrole	61825		U011	10
Ammonia	7664417	500		100
Ammonium acetate	631618			5,000
Ammonium benzoate	1863634			5,000
Ammonium bicarbonate	1066337			5,000
Ammonium bichromate	7789095			10
Ammonium bifluoride	1341497			100
Ammonium bisulfite	10192300			5,000
Ammonium carbamate	1111780			5,000
Ammonium carbonate	506876			5,000
Ammonium chloride	12125029			5,000
Ammonium chromate	7788989			10
Ammonium citrate, dibasic	3012655			5,000
Ammonium fluoborate	13826830			5,000
Ammonium fluoride	12125018			100
Ammonium hydroxide	1336216			1,000
Ammonium oxalate	6009707 5972736 14258492			5,000
Ammonium picrate (R)	131748		P009	10
Ammonium silicofluoride	16919190			1,000
Ammonium sulfamate	7773060			5,000
Ammonium sulfide	12135761			100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Ammonium sulfite	10196040			5,000
Ammonium tartrate	14307438 3164292			5,000
Ammonium thiocyanate	1762954			5,000
Ammonium vanadate	7803556		P119	1,000
Amphetamlne	300629	1,000		1
Amyl acetate	628637			5,000
Iso-Amyl acetate	123922			
Sec-Amyl acetate	626380			
Tert-Amyl acetate	625161			
Aniline (I,T)	62533	1,000	U012	5,000
Aniline, 2,4,6- trimethyl	88051	500		1
o-Anisidine	90040			100
Anthracene	120127			5,000
Antimony++	7440360			5,000
Antimony pentachloride	7647189			1,000
Antimony pentafluoride	7783702	500		1
Antimony potassium tartrate	28300745			100
Antimony tribromide	7789619			1,000
Antimony trichloride	10025919			1,000
Antimony trifluoride	7783564			1,000
Antimony trioxide	1309644			1,000
Antimycin A	1397940	1,000/10,000		1
ANTU (Thiourea 1-Naphthalenyl)	86884	500/10,000		100
Argentate(1-), bis(cyano-C)-, potassium	506616		P099	1
Aroclor 1016	12674112			1
Aroclor 1221	11104282			1
Aroclor 1232	11141165			1
Aroclor 1242	53469219			1
Aroclor 1248	12672296			1
Aroclor 1254	11097691			1
Aroclor 1260	11096825			1
Aroclors	1336363			1
Arsenic++	7440382			1
Arsenic acid H_3AsO_4	1327522 7778394		P010	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Arsenic disulfide	1303328			1
Arsenic oxide As_2O_3	1327533		P012	1
Arsenic oxide As_2O_5	1303282		P011	1
Arsenic pentoxide	1303282	100/10,000	P011	1
Arsenic trichloride	7784341			1
Arsenic trioxide	1327533		P012	1
Arsenic trisulfide	1303339			1
Arsenous oxide	1327533	100/10,000	P012	1
Arsenous trichloride	7784341	500		5,000
Arsine	7784421	100		1
Arsine, diethyl-	692422		P038	1
Arsinic acid, dimethyl-	75605		U136	1
Arsorous dichloride, phenyl-	696286		P036	1
Asbestos+++	1332214			1
Auramine	492808		U014	100
Azaserine	115026		U015	1
Aziridine	151564		P054	1
Azindine, 2-methyl-	75558		P067	1
Azirino[2',3',3,4]pyrrolo[1,2-a]indole-4, 7-dione,6-amino-8-[[aminocarbonylooxy) methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-,[1aS-(1a-alpha, 8-beta, 8a-alpha, 8b-alpha)]-	50077		U010	10
Azinphos-ethyl	2642719	100/10,000		100
Azinphos-methyl	86500	10/10,000		1
Barium cyanide	542621		P013	10
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56495		U157	10
Benz[c]acridine	225514		U016	100
Benzal chloride	98873	500	U017	5,000
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950585		U192	5,000
Benz[a]anthracene	56553		U018	10
1,2-Benzanthracene	56553		U018	10
Benz[a]anthracene, 7,12-dimethyl-	57976		U094	1
Benzenamine (I,T)	62533		U012	5,000
Benzenamine, 3-(Trifluoromethyl)	98168	500		1
Benzenamine, 4,4'-carbonimidoylbis (N,N-dimethyl-	492808		U014	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Benzenamine, 4-chloro-	106478		P024	1,000
Benzenamine, 4-chloro-2-methyl-, hydrochloride	3165933		U049	100
Benzenamine, N,N-dimethyl-4-(phenylazo-)	60117		U093	10
Benzenamine, 2-methyl-	95534		U328	100
Benzenamine, 4-methyl-	106490		U353	100
Benzenamine, 4,4'-methylenebis(2-chloro-	101144		U158	10
Benzenamine, 2-methyl-, hydrochloride	636215		U222	100
Benzenamine, 2-methyl-5-nitro-	99558		U181	100
Benzenamine, 4-nitro-	100016		P077	5,000
Benzene (I,T)	71432		U109	10
Benzene, 1-(Chloromethyl)-4-Nitro-	100141	500/10,000		1
Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156		U038	10
Benzene, 1-bromo-4-phenoxy-	101553		U030	100
Benzenearsonic Acid	98055	10/10,000		1
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	305033		U035	10
Benzene, choro-	108907		U037	100
Benzene, chloromethyl-	100447		P028	100
Benzenediamin, ar-methyl-	25376458 95807 496720 823405		U221	10
1,2-Benzenedicarboxylic acid, dioctyl ester	117840		U107	5,000
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]-ester	117817		U028	100
1,2-Benzenedicarboxylic acid, dibutyl ester	84742		U069	10
1,2-Benzenedicarboxylic acid, diethyl ester	84662		U088	1,000
1,2-Benzenedicarboxylic acid, dimethyl ester	131113		U102	5,000
Benzene, 1,2-dichloro-	95501		U070	100
Benzene, 1,3-dichloro-	541731		U071	100
Benzene, 1,4-dichloro-	106467		U072	100
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	72548		U060	1
Benzene, dichloromethyl-	98873		U017	5,000
Benzene, 1,3-diisocyanotomethyl- (R,T)	584849 91087 264716254		U223	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Benzene, dimethyl (I,T)	1330207		U239	100
m-Benzene, dimethyl	108383			1,000
o-Benzene, dimethyl	95476			1,000
p-Benzene, dimethyl	106423			100
1,3-Benzenediol	108463		U201	5,000
1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]- (R) -	51434		P042	1,000
Benzeneethanamine, alpha, alpha-dimethyl-	122098		P046	5,000
Benzene, hexachloro-	118741		U127	10
Benzene, hexahydro- (I)	110827		U056	1,000
Benzene, hydroxy-	108952		U188	1,000
Benzene, methyl-	108883		U220	1,000
Benzene, 2-methyl-1,3-dinitro-	606202		U106	100
Benzene, 1-methyl-2,4-dinitro-	121142		U105	10
Benzene, 1-methylethyl- (I)	98828		U055	5,000
Benzene, nitro-	98953		U169	1,000
Benzene, pentachloro-	608935		U183	10
Benzene, pentachloronitro-	82688		U185	100
Benzenesulfonic acid chloride (C,R)	98099		U020	100
Benzenesulfonyl chloride	98099		U020	100
Benzene, 1,2,4,5-tetrachloro-	95943		U207	5,000
Benzenethiol	108985		P014	100
Benzene, 1,1'-(2,2,2-tri-chloroethylidene)bis[4-chloro-	50293		U061	1
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	72435		U247	1
Benzene, (trichloromethyl)-	98077		U023	10
Benzene, 1,3,5-trinitro-	99354		U234	10
Benzidine	92875		U021	1
Benzimidazole, 4,5-Dichloro-2-(Trifluoromethyl)-	3615212	500/10,000		1
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81072		U202	100
Benzo[a]anthracene	56553		U018	10
Benzo[b]fluoranthene	205992			1
Benzo[k]fluoranthene	207089			5,000
Benzo[j,k]fluorene	206440		U120	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
1,3-Benzodioxole, 5-(1-propenyl)-	120581		U141	100
1,3-Benzodioxole, 5-(2-propenyl)-	94597		U203	100
1,3-Benzodioxole, 5-propyl-	94586		U090	10
Benzoic acid	65850			5,000
Benzonitrile	100470			5,000
Benzo[rst]pentaphene	189559		U064	10
Benzo[ghi]perylene	191242			5,000
2H-1-Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenyl-butyl)-, & salts, when present at concentrations greater than 0.3%	81812		P001	100
Benzo[a]pyrene	50328		U022	1
3,4-Benzopyrene	50328		U022	1
p-Benzoquinone	106514		U197	10
Benzotrichloride (C,R,T)	98077	500	U023	10
Benzoyl chloride	98884			1,000
1,2-Benzphenanthrene	218019		U050	100
Benzyl chloride	100447	500	P028	100
Benzyl cyanide	140294	500		1
Beryllium++	7440417		P015	10
Beryllium chloride	7787475			1
Beryllium fluoride	7787497			1
Beryllium nitrate	13597994 7787555			1
alpha-BHC	319846			10
beta-BHC	319857			1
delta-BHC	319868			1
gamma-BHC	58899		U129	1
Bicyclo [2,2,1]Heptane-2-carbonitrile, 5-chloro-6-(((Methylamino)Carbonyl) Oxy)Imino)-,(1s-(1-alpha, 2-beta, 4-alpha, 5-alpha, 6E))-	15271417	500/10,000		1
2,2'-Bioxirane	1464535		U085	10
Biphenyl	92524			100
(1,1'-Biphenyl)-4,4'diamine	92875		U021	1
(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-	91941		U073	1
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethoxy-	119904		U091	10
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethyl-	119937		U095	10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
Bis(chloromethyl) ketone	534076	10/10,000		1
Bis(2-chloroethyl)ether	111444		U025	10
Bis(2-chloroethoxy)methane	111911		U024	1,000
Bis(2-ethylhexyl)phthalate	117817		U028	100
Bitoscanate	4044659	500/10,000		1
Boron trichloride	10294345	500		1
Boron trifluoride	7637072	500		1
Boron trifluoride compound with methyl ether (1:1)	353424	1,000		1
Bromoacetone	598312		P017	1,000
Bromadiolone	28772567	100/10,000		1
Bromine	7726956	500		1
Bromoform	75252		U225	100
4-Bromophenyl phenyl ether	101553		U030	100
Brucine	357573		P018	100
1,3-Butadiene	106990			10
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683		U128	1
1-Butanamine, N-butyl-N-nitroso-	924163		U172	10
1-Butanol	71363		U031	5,000
2-Butanone	78933		U159	5,000
2-Butanone peroxide (R,T)	1338234		U160	10
2-Butanone, 3,3-dimethyl-1-(methylthio)-, O[(methylamno)carbonyl] oxime	39196184		P045	100
2-Butenal	123739 4170303		U053	100
2-Butene, 1,4-dichloro- (I,T)	764410		U074	1
2-Butenoic acid, 2-methyl-, 7[[2,3-dihydroxy-2-(1-meth-oxyethyl)-3-methyl-1-oxobutoxy] methyl]-2,3,5,7a-tetrahydro-1H-pyrrolizin-1-yl ester, [1S-[1-alpha(Z),7(2S*,3R*), 7a-alpha]]-	303344		U143	10
Butyl acetate	123864			5,000
iso-Butyl acetate	110190			
sec-Butyl acetate	105464			
tert-Butyl acetate	540885			
n-Butyl alcohol (I)	71363		U031	5,000
Butylamine	109739			1,000
iso-Butylamine	78819			

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
sec-Butylamine	513495			
tert-Butylamine	13952846 75649			
Butyl benzyl phthalate	85687			100
n-Butyl phthalate	84742		U069	10
Butyric acid	107926			5,000
iso-Butyric acid	79312			
Cacodylic acid	75605		U136	1
Cadmium++ (2+)	7440439			10
Cadmium acetate	543908			10
Cadmium bromide	7789426			10
Cadmium chloride	10108642			10
Cadmium oxide	1306190	100/10,000		1
Cadmium stearate	2223930	1,000/10,000		1
Calcium arsenate	7778441	500/10,000		1
Calcium arsenite	52740166			1
Calcium carbide	75207			10
Calcium chromate	13765190		U032	10
Calcium cyanamide	156627			1,000
Calcium cyanide Ca(CN)2	592018		P021	10
Calcium dodecylbenzenesulfonate	26264062			1,000
Calcium hypochlorite	7778543			10
Camphechlor	8001352	500/10,000		1
Camphene, octachloro-	8001352		P123	1
Cantharidin	56257	100/10,000		1
Carbachol chloride	51832	500/10,000		1
Caprolactum	105602			5,000
Captan	133062			10
Carbamic acid, ethyl ester	51796		U238	100
Carbamic acid, methylnitroso-, ethyl ester	615532		U178	1
Carbamic acid, Methyl-, 0-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methyllene)Amino)-	26419738	100/10,000		1
Carbamic chloride, dimethyl-	79447		U097	1
Carbamodithioic acid, 1,2-ethaneiylbis, salts & esters	111546		U114	5,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	2303164		U062	100
Carbaryl	63252			100
Carbofuran	1563662	10/10,000		10
Carbon disulfide	75150	10,000	P022	100
Carbon oxyfluoride (R,T)	353504		U033	1,000
Carbon tetrachloride	56235		U211	10
Carbonic acid, dithallium(1+) salt	6533739		U215	100
Carbonic dichloride	75445		P095	10
Carbonic difluoride	353504		U033	1,000
Carbonochloridic acid, methyl ester	79221		U156	1,000
Carbonyl Sulfide	463581			100
Carbophenothion	786196	500		1
Catechol	120809			100
Chloral	75876		U034	5,000
Chlorambem	133904			100
Chlorambucil	305033		U035	10
Chlordane	57749	1,000	U036	1
Chlordane, alpha & gamma isomers	57749		U036	1
Chlordane, technical	57749		U036	1
Chlorfenvinfos	470906	500		1
Chlorinated champhene (Campheclor)	8001352			1
Chlorine	7782505	100		10
Chlormephos	24934916	500		1
Chlormequat chloride	999815	100/10,000		1
Chlornaphazine	494031		U026	100
Choroacetaldehyde	107200		P023	1,000
Chloroacetophenone	532274			100
Chloroacetic acid	79118	100/10,000		100
p-Chloroaniline	106478		P024	1,000
Chlorobenzene	108907		U037	100
Chlorobenzilate	510156		U038	10
p-Chloro-m-cresol (4)	59507		U039	5,000
1-Chloro-2,3-epoxypropane	106898		U041	100
Chlorodibromomethane	124481			100
Chloroethane	75003			100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
Chloroethanol	107073	500		1
Chloroethyl chlorofomate	627112	1,000		1
2-Chloroethyl vinyl ether	110758		U042	1,000
Chloroform	67663	10,000	U044	10
Chloromethane	74873		U045	100
Chloromethyl ether	542881	100	P016	1
Chloromethyl methyl ether	107302	100	U046	1
beta-Chloronaphthalene	91587		U047	5,000
2-Chloronaphthalene	91587		U047	5,000
Chlorophacinone	3691358	100/10,000		1
o-Chlorophenol (2)	95578		U048	100
4-Chlorophenyl phenyl ether	7005723			5,000
1-(o-Chlorophenyl)thiourea	5344821		P026	100
Chloroprene	126998			100
3-Chloropropionitrile	542767		P027	1,000
Chlorosulfonic acid	7790945			1,000
4-Chloro-o-toluidine, hydrochloride	3165933		U049	100
Chlorpyrifos	2921882			1
Chloroxuron	1982474	500/10,000		1
Chlorthiophos	21923239	500		1
Chromic acetate	1066304			1,000
Chromic acid	11115745 7738945			10
Chromic acid H_2CrO_4, calcium salt	13765190		U032	10
Chromic chloride (Chromium chloride)	10025737	1/10,000		1
Chromic sulfate	10101538			1,000
Chromium++	7440473			5,000
Chromous chloride	10049055			1,000
Chrysene	218019		U050	100
Cobalt, ((2,2'-(1,2-ethanediylbis (Nitrilo-methylidyne))Bis(6-fluoro-phenolato))(2-)-N,N',O,O')-,	62207765	100/10,000		1
Cobaltous bromide	7789437			1,000
Cobalt carbonyl	10210681	10/10,000		1
Cobaltous formate	544183			1,000
Cobaltous sulfamate	14017415			1,000
Coke Oven Emissions	NA			1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Colchicine	64868	10/10,000		1
Copper++	7440508			5,000
Copper cyanide	544923		P029	10
Coumaphos	56724	100/10,000		10
Coumatetralyl	5836293	500/10,000		1
Creosote	8001589		U051	1
Cresol(s) (Phenol, Methyl)	1319773		U052	100
m-Cresol	108394	1,000/10,000		100
o-Cresol	95487			100
p-Cresol	106445			100
Cresylic acid	1319773		U052	100
m-Cresylic acid	108394			100
o-Cresylic acid	95487			100
p-Cresylic acid	106445			100
Crimidine	535897	100/10,000		1
Crotonaldehyde	123739 4170303	1,000 1,000	U053	100 100
Cumene (I)	98828		U055	5,000
Cupric acetate	142712			100
Cupric acetoarsenite	12002038			1
Cupric chloride	7447394			10
Cupric nitrate	3251238			100
Cupric oxalate	5893663			100
Cupric sulfate	7758987			10
Cupric sultate, ammoniated	10380297			100
Cupric tartrate	815827			100
Cyanides (soluble salts and complexes) not otherwise specified	57125		P030	10
Cyanogen	460195		P031	100
Cyanogen bromide	506683	500/10,000	U246	1,000
Cyanogen chloride	506774		P033	10
Cyanogen iodide (Iodine cyanide)	506785	1,000/10,000		1
Cyanophos	2636262	1,000		1
Cyanuric fluoride	675149	100		1
2,5-Cyclohexadiene-1,4-dione	106514		U197	10
Cyclohexane (I)	110827		U056	1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Cyclohexane, 1,2,3,4,5,6-hexachloro, (1-alpha, 2-alpha, 3-beta, 4-alpha, 5-alpha, 6-beta)-	58899		U129	1
Cyclohexanone (I)	108941		U057	5,000
2-Cyclohexanone	131895		P034	100
Cycloheximide	66819	100/10,000		1
Cyclohexylamine	108918	10,000		1
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474		U130	10
Cyclophosphamide	50180		U058	10
2,4-D Acid	94757		U240	100
2,4-D Ester	94111 94791 94804 1320189 1928387 1928616 1929733 2971382 25168267 53467111			100
2,4-D, salts & esters (2,4-Dichlorophenoxyacetic Acid)	94757		U240	100
Daunomycin	20830813		U059	10
Decarborane(14)	17702419	500/10,000		1
Demeton	8065483	500		1
Demeton-S-Methyl	919868	500		1
DDD, 4,4'DDD	72548		U060	1
DDE, 4,4'DDE	72559			1
DDT, 4,4'DDT	50293		U061	1
DEHP (Diethylhexyl phthalate)	117817		U028	100
Diallate	2303164		U062	100
Dialifor	10311849	100/10,000		1
Diazinon	333415			1
Diazomethane	334883			100
Dibenz[a,h]anthracene	53703		U063	1
1,2:5,6-Dibenzanthracene	53703		U063	1
Dibenzo[a,h]anthracene	53703		U063	1
Dibenzofuran	132649			100
Dibenz[a,i]pyrene	189559		U064	10
1,2-Dibromo-3-chloropropane	96128		U066	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Dibromoethane	106934		U067	1
Diborane	19287457	100		1
Dibutyl phthalate	84742		U069	10
Di-n-butyl phthalate	84742		U069	10
Dicamba	1918009			1,000
Dichlobenil	1194656			100
Dichlone	117806			1
Dichlorobenzene	25321226			100
m-Dichlorobenzene (1,3)	541731		U071	100
o-Dichlorobenzene (1,2)	95501		U070	100
p-Dichlorobenzene (1,4)	106467		U072	100
3,3'-Dichlorobenzidine	91941		U073	1
Dichlorobromomethane	75274			5,000
1,4-Dichloro-2-butene (I,T)	764410		U074	1
Dichlorodifluoromethane	75718		U075	5,000
1,1-Dichloroethane	75343		U076	1,000
1,2-Dichloroethane	107062		U077	100
1,1-Dichloroethylene	75354		U078	100
1,2-Dichloroethylene	156605		U079	1,000
Dichloroethyl ether	11444	10,000	U025	10
Dichloroisopropyl ether	108601		U027	1,000
Dichloromethoxy ethane	111911		U024	1,000
Dichloromethyl ether	542881		P016	1
Dichloromethylphenylsilane	149746	1,000		1
2,4-Dichlorophenol	120832		U081	100
2,6-Dichlorophenol	87650		U082	100
Dichlorophenylarsine	696286		P036	1
Dichloropropane	26638197			1,000
1,1-Dichloropropane	78999			
1,3-Dichloropropane	142289			
1,2-Dichloropropane	78875		U083	1,000
Dichloropropane--Dichloropropene (mixture)	8003198			100
Dichloropropene	26952238			100
2,3-Dichloropropene	78886			
1,3-Dichloropropene	542756		U084	100
2,2-Dichloropropionic acid	75990			5,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Dichlorvos	62737	1,000		10
Dicofol	115322			10
Dicrotophos	141662	100		1
Dieldrin	60571		P037	1
1,2:3,4-Diepoxybutane (I,T)	1464535	500	U085	10
Diethanolamine	111422			100
Diethyl chlorophospate	814493	500		1
Diethylamine	109897			1,000
Diethylarsine	692422		P038	1
Diethylcarbmazine citrate	1642542	100/10,000		1
1,4-Diethylenedioxide	123911		U108	100
Diethylhexyl phthalate	117817		U028	100
N,N-Diethylaniline	91667			1,000
N,N'-Diethylhydrazine	1615801		U086	10
O,O-Diethyl S-methyl dithiophosphate	3288582		U087	5,000
Diethyl-p-nitrophenyl phosphate	311455		P041	100
Diethyl phthalate	84662		U088	1,000
O,O-Diethyl O-pyrazinyl phosphorothioate	297972		P040	100
Diethylstilbestrol	56531		U089	1
Diethyl sulfate	64675			10
Digitoxin	71636	100/10,000		1
Diglycidyl ether	2238075	1,000		1
Digoxin	20830755	10/10,000		1
Dihydrosafrole	94586		U090	10
Diisopropyfluorophosphate	55914		P043	100
Diisopropylfluorophosphate, 1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-10-hexachloro-1,4,4a,5,8,8a-hexahydro-, (1-alpha, 4-alpha, 4a-beta, 5-alpha, 8-alpha, 8a-beta)-	309002		P004	1
1,4,5,8-Dimethanonaphthalene, 1,2,3,4,10,10-hexachloro-1,4,4a,5,8,8a-hexahydro, (1-alpha, 4-alpha, 4a-beta, 5a-beta, 8-beta, 8a-beta)-	465736		P060	1
2,7:3,6-Dimethanonaphth[2,3 b]oxirene,3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octahydro-,(1a-alpha, 2-beta, 2a-alpha, 3-beta, 6-beta, 6a-alpha, 7beta, 7aalpha)-	60571		P037	1
2,7:3,6 Dimethanonaphth[2,3-b]oxirene, 3,4,5,6,9,9-hexachloro-1a,2,2a,3,6,6a,7,7a-octa-hydro-, (1a-alpha, 2-beta, 2a-beta, 3-alpha, 6-alpha, 6a-beta, 7-beta, 7a-alpha)-	72208		P051	1
Dimethoate	60515		P044	10
3,3'-Dimethoxybenzidine	119904		U091	10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Dimefox	115264	500		1
Dimethoate	60515	500/10,000		10
Dimethyl Phosphorochloridothioate	2524030	500		1
Dimethyl sulfate	77781	500		100
Dimethylamine (I)	124403		U092	1,000
p-Dimethylaminoazobenzene	60117		U093	10
7,12-Dimethylbenz[a]anthracene	57976		U094	1
3,3'-Dimethylbenzidine	119937		U095	10
alpha,alpha-Dimethylbenzylhydroperoxide(R)	80159		U096	10
Dimethylcarbamoyl chloride	79447		U097	1
Dimethylformamide	68122			100
Dimethyldichlorosilane	75785	500		1
1,1-Dimethylhydrazine	57147	1,000	U098	10
1,2-Dimethylhydrazine	540738		U099	1
alpha, alpha-Dimethylphenethylamine	122098		P046	5,000
Dimethyl-p-phenylenediamine	99989	10/10,000		1
2,4-Dimethylphenol	105679		U101	100
Dimethyl phthalate	131113		U102	5,000
Dimethyl sulfate	77781		U103	100
Dimetilan	644644	500/10,000		1
Dinitrobenzene (mixed)	25154545			100
m-Dinitrobenzene	99650			
o-Dinitrobenzene	528290			
p-Dinitrobenzene	100254			
4,6-Dinitro-o-cresol and salts	534521	10/10,000	P047	10
Dinitrophenol	25550587			10
2,5-Dinitrophenol	329715			
2,6-Dinitrophenol	573568			
2,4-Dinitrophenol	51285		P048	10
Dinitrotoluene	25321146			10
3,4-Dinitrotoluene	610399			
2,4-Dinitrotoluene	121142		U105	10
2,6-Dinitrotoluene	606202		U106	100
Dinoseb	88857	100/10,000	P020	1,000
Dinoterb	1420071	500/10,000		1
Di-n-octyl phthalate	117840		U107	5,000
1,4-Dioxane	123911		U108	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Dioxathion	78342	500		1
Diphacinone	82666	10/10,000		1
1,2-Diphenylhydrazine	122667		U109	10
Diphosphoramide, octamethyl-	152169	100	P085	100
Diphosphoric acid, tetraethyl ester	107493		P111	10
Dipropylamine	142847		U110	5,000
Di-n-propylnitrosamine	621647		U111	10
Diquat	85007 2764729			1,000
Disulfoton	298044	500	P039	1
Dithiazanine iodide	514738	500/10,000		1
Dithiobiuret	541537	100/10,000	P049	100
Diuron	330541			100
Dodecylbenzenesulfonic acid	27176870			1,000
Emetine, Dihydrochloride	316427	1/10,000		1
Endosulfan	115297	10/10,000	P050	1
alpha-Endosulfan	959988			1
beta-Endosulfan	33213659			1
Endosulfant sulfate	1031078			1
Endothall	145733		P088	1,000
Endothion	2778043	500/10,000		1
Endrin	72208	500/10,000	P051	1
Endrin aldehyde	7421934			1
Endrin & metabolites	72208		P051	1
Epichlorohydrin	106898	1,000	U041	100
Epinephrine	51434		P042	1,000
EPN	2104645	100/10,000		1
1,2-Epoxybutane	106887			100
Ergocalciferol	50146	1,000/10,000		1
Ergotamine tartrate	379793	500/10,000		1
Ethanal	75070		U001	1,000
Ethanamine, N-ethyl-N-nitroso-	55185		U174	1
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	91805		U155	5,000
Ethane, 1,2-dibromo-	106934		U067	1
Ethane, 1,1-dichloro-	75343		U076	1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Ethane, 1,2-dichloro-	107062		U077	100
Ethanedinitrile	460195		P031	100
Ethane, hexachloro-	67721		U131	100
Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	111911		U024	1,000
Ethane, 1,1'-oxybis-	60297		U117	100
Ethane, 1,1'-oxybis(2-chloro-	111444		U025	10
Ethane, pentachloro-	76017		U184	10
Ethanesulfonyl chloride, 2-chloro	1622328	500		1
Ethane, 1,1,1,2-tetrachloro-	630206		U208	100
Ethane, 1,1,2,2-tetrachloro-	79345		U209	100
Ethanethioamide	62555		U218	10
Ethane, 1,1,1-trichloro-	71556		U226	1,000
Ethane, 1,1,2-trichloro-	79005		U227	100
Ethanimidothioic acid, N-[[(methylamino) carbonyl]oxy]-, methyl ester	16752775		P066	100
Ethanol, 1,2-Dichloro-, acetate	10140871	1,000		1
Ethanol, 2-ethoxy-	110805		U359	1,000
Ethanol, 2,2'-(nitrosoimino)bis-	1116547		U173	1
Ethanone, 1-phenyl-	98862		U004	5,000
Ethene, chloro-	75014		U043	1
Ethene, 2-chloroethoxy-	110758		U042	1,000
Ethene, 1,1-dichloro-	75354		U078	100
Ethene, 1,2-dichloro- (E)	156605		U079	1,000
Ethene, tetrachloro-	127184		U210	100
Ethene, trichloro-	79016		U228	100
Ethion	563122	1,000		10
Ethoprophos	13194484	1,000		1
Ethyl acetate (I)	141786		U112	5,000
Ethyl acrylate (I)	140885		U113	1,000
Ethylbenzene	100414			1,000
Ethylbis(2-Chloroethyl)amine	538078	500		1
Ethyl carbamate (urethane)	51796		U238	100
Ethyl chloride	75003			100
Ethyl cyanide	107120		P101	10
Ethylenebisdithiocarbamic acid, salts & esters	111546		U114	5,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Ethylenediamine	107153			5,000
Ethylenediamine-tetraacetic acid (EDTA)	60004			5,000
Ethylene dibromide	106934		U067	1
Ethylene dichloride	107062		U077	100
Ethylene fluorohydrin	371620	10		1
Ethylene glycol	107211			5,000
Ethylene glycol monoethyl ether	110805		U359	1,000
Ethylene oxide (I,T)	75218	1,000	U115	10
Ethylenediamine	107153	10,000		5,000
Ethylenethiourea	96457		U116	10
Ethyleneimine	151564	500	P054	1
Ethyl ether (I)	60297		U117	100
Ethylthiocyanate	542905	10,000		1
Ethylidene dichloride	75343		U076	1,000
Ethyl methacrylate	97632		U118	1,000
Ethyl methanesulfonate	62500		U119	1
Famphur	52857		P097	1,000
Fenamlphos	22224926	10/10,000		1
Fenltrothion	122145	500		1
Fensulfothion	115902	500		1
Ferric ammonium citrate	1185575			1,000
Ferric ammonium oxalate	2944674 55488874			1,000
Ferric chloride	7705080			1,000
Ferric fluoride	7783508			100
Ferric nitrate	10421484			1,000
Ferric sulfate	10028225			1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Ferrous ammonium sulfate	10045893			1,000
Ferrous chloride	7758943			100
Ferrous sulfate	7720787 7782630			1,000
Fluenetil	4301502	100/10,000		1
Fluoranthene	206440		U120	100
Fluorene	86737			5,000
Fluorine	7782414	500	P056	10
Fluoroacetamide	640197	100/10,000	P057	100
Fluoracetic acid	144490	10/10,000		1
Fluoroacetic acid, sodium salt	62786		P058	10
Fluoroacetyl chloride	359068	10		1
Fluorouracil	51218	500/10,000		1
Fonofos	944229	500		1
Formaldehyde	50000	500	U122	100
Formaldehyde cyanohydrin	107164	1,000		1
Formetanate hydrochloride	23422539	500/10,000		1
Formothion	2540821	100		1
Formparanate	17702577	100/10,000		1
Formic acid (C,T)	64186		U123	5,000
Fosthletan	21548323	500		1
Fubendazole	3878191	100/10,000		1
Fulminic acid, mercury(2-) salt (R,T)	628864		P065	10
Fumaric acid	110178			5,000
Furan (I)	110009	500	U124	100
Furan, tetrahydro- (I)	109999		U213	1,000
2-Furancarboxaldehyde (I)	98011		U125	5,000
2,5-Furandione	108316		U147	5,000
Furfural (I)	98011		U125	5,000
Furfuran (I)	110009		U124	100
Gallium trichloride	13450903	500/10,000		1
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	18883664		U206	1
D-Glucose, 2-deoxy-2-[[(methylnitrosoamino)-carbonyl]amino]-	18883664		U206	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Glycidylaldehyde	765344		U126	10
Guanidine, N-methyl-N'-nitro-N-nitroso-	70257		U163	10
Guthion	86500			1
Heptachlor	76448		P059	1
Heptachlor epoxide	1024573			1
Hexachlorobenzene	118741		U127	10
Hexachlorobutadiene	87683		U128	1
Hexachlorocyclohexane (gamma isomer)	58899		U129	1
Hexachlorocyclopentadiene	77474	100	U130	10
Hexachloroethane	67721		U131	100
Hexachlorophene	70304		U132	100
Hexachloropropene	1888717		U243	1,000
Hexaethyl tetraphosphate	757584		P062	100
Hexamethylene-1, 6-diisocyanate	822060			100
Hexamethylphosphoramide	680319			1
Hexamethylenediamine, N,N'-Dibutyl	4835114	500		1
Hexane	110543			5,000
Hexone (Methyl isobutyl ketone)	108101		U161	5,000
Hydrazine (R,T)	302012	1,000	U133	1
Hydrazine, 1,2-diethyl-	1615801		U086	10
Hydrazine, 1,1-dimethyl-	57147		U098	10
Hydrazine, 1,2-dimethyl-	540738		U099	1
Hydrazine, 1,2-diphenyl-	122667		U109	10
Hydrazine, methyl-	60344		P068	10
Hydrazinecarbothioamide	79196		P116	100
Hydrochloric acid	7647010			5,000
Hydrocyanic acid	74908	100	P063	10
Hydrofluoric acid	7664393		U134	100
Hydrogen chloride (gas only)	7647010	500		5,000
Hydrogen cyanide	74908		P063	10
Hydrogen fluoride	7664393	100	U134	100
Hydrogen peroxide (Conc >52%)	7722841	1,000		1
Hydrogen phosphide	7803512		P096	100
Hydrogen selenide	7783075	10		1
Hydrogen sulfide	7783064	500	U135	100
Hydroperoxide, 1-methyl-1-phenylethyl-	80159		U096	10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Hydroquinone	123319	500/10,000		100
2-Imidazolidinethione	96457		U116	10
Indeno(1,2,3-cd)pyrene	193395		U137	100
Iodomethane	74884		U138	100
Iron, Pentacarbonyl-	13463406	100		1
Isobenzan	297789	100/10,000		1
1,3-Isobenzofurandione	85449		U190	5,000
Isobutyronitrile	78820	1,000		1
Isobutyl alcohol (I,T)	78831		U140	5,000
Isocyanic acid, 3,4-Dichlorophenyl ester	102363	500/10,000		1
Isodrin	465736	100/10,000	P060	1
Isofluorphate	55914	100		100
Isophorone	78591			5,000
Isophorone Diisocyanate	4098719	100		1
Isoprene	78795			100
Isopropanolamine dodecylbenzene sulfonate	42504461			1,000
Isopropyl chloroformate	108236	1,000		1
Isopropylmethylpryrazolyl dimethylcarbamate	119380	500		1
Isosafrole	120581		U141	100
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964		P007	1,000
Kepone	143500		U142	1
Lactonitrile	78977	1,000		1
Lasiocarpine	303344		U143	10
Lead acetate	301042		U144	#
Lead arsenate	7784409 7645252 10102484			1
Lead, bis(acetato-O)tetrahydroxytri	1335326		U146	10
Lead chloride	7758954			10
Lead fluoborate	13814965			10
Lead fluoride	7783462			10
Lead iodide	10101630			10
Lead nitrate	10099748			10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Lead phosphate	7446277		U145	10
Lead stearate	7428480 1072351 52652592 56189094			10
Lead subacetate	1335326		U146	10
Lead sulfate	15739807 7446142			10
Lead sulfide	1314870			10
Lead thiocyanate	592870			10
Leptophos	21609905	500/10,000		1
Lewisite	541253	10		1
Lindane	58899	1,000/10,000	U129	1
Lithium chromate	14307358			10
Lithium hydride	7580678	100		1
Malathion	121755			100
Maleic acid	110167			5,000
Maleic anhydride	108316		U147	5,000
Maleic hydrazide	123331		U148	5,000
Malononitrile	109773	500/10,000	U149	1,000
Manganese, tricarbonyl methylcyclopentadienyl	12108133	100		1
MDI (Methylene diphenyl diisocyanate)	101688			5,000
Mechlorethamine	51752	10		1
MEK (Methyl ethyl ketone)	78933		U159	5,000
Melphalan	148823		U150	1
Mephosfolan	950107	500		1
Mercaptodimethur	2032657			10
Mercuric acetate	1600277	500/10,000		1
Mercuric chloride	7487947	500/10,000		1
Mercuric cyanide	592041			1
Mercuric nitrate	10045940			10
Mercuric oxide	21908532	500/10,000		1
Mercuric sulfate	7783359			10
Mercuric thiocyanate	592858			10
Mercurous nitrate	10415755 7782867			10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Mercury	7439976		U151	1
Mercury (acetate-O)phenyl-	62384		P092	100
Mercury fulminate	628864		P065	10
Methacrolein diacetate	10476956	1,000		1
Methacrylic anhydride	760930	500		1
Methacrylonitrile (I,T)	126987	500	U152	1,000
Methacryloyl chloride	920467	100		1
Methacryloyloxyethyl isocyanate	30674807	100		1
Methamidophos	10265926	100/10,000		1
Methanamine, N-methyl-	124403		U092	1,000
Methanamine, N-methyl-N-nitroso-	62759		P082	10
Methane, bromo-	74839		U029	1,000
Methane, chloro- (I,T)	74873		U045	100
Methane, chloromethoxy-	107302		U046	1
Methane, dibromo-	74953		U068	1,000
Methane, dichloro-	75092		U080	1,000
Methane, dichlorodifluoro-	75718		U075	5,000
Methane, iodo-	74884		U138	100
Methane, isocyanato-	624839		P064	10
Methane, oxybis(chloro-	542881		P016	1
Methanesulfenyl chloride, trichloro-	594423		P118	100
Methanesulfonyl fluoride	558258	1,000		1
Methanesulfonic acid, ethyl ester	62500		U119	1
Methane, tetrachloro-	56235		U211	10
Methane, tetranitro- (R)	509148		P112	10
Methane, tribromo-	75252		U225	100
Methane, trichloro-	67663		U044	10
Methane, trichlorofluoro-	75694		U121	5,000
Methanethiol (I,T)	74931		U153	100
6,9-Methano-2,4,3-benzodioxathiepin, 6,7,8,9,10, 10-hexa-chloro-1,5,5a,6,9,9a-hexahydro-, 3-oxide	115297		P050	1
1,3,4-Metheno-2H-cyclobutal[cd]pentalen-2-one, 1,1a,3,3a,4,5,5a,5b,6-decachloroctahydro-	143500		U142	1
4,7-Methano-1H-indene, 1,4,5,6,7,8,8 heptachloro-3a,4,7,7a-tetrahydro-	76448		P059	1
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8 octachloro-2,3,3a,4,7,7a-hexahydro-	57749		U036	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Methanol (I)	67561		U154	5,000
Methapyrilene	91805		U155	5,000
Methidathion	950378	500/10,000		1
Methiocarb	2032657	500/10,000	P199	10
Methomyl	16752775	500/10,000	P066	100
Methoxychlor	72435		U247	1
Methoxyethylmercuric acetate	151382	500/10,000		1
Methyl alcohol (I)	67561		U154	5,000
Methyl aziridine	75558		P067	1
Methyl bromide	74839	1,000	U029	1,000
1-Methylbutadiene (I)	504609		U186	100
Methyl chloride (I,T)	74873		U045	100
Methyl 2-chloroacrylate	80637	500		1
Methyl chlorocarbonate (I,T)	79221		U156	1,000
Methyl chloroform	71556		U226	1,000
Methyl chloroformate	79221	500	U156	1,000
3-Methylcholanthrene	56495		U157	10
4,4'-Methylenebis(2-chloroaniline)	101144		U158	10
Methylene bromide	74953		U068	1,000
Methylene chloride	75092		U080	1,000
4,4'-Methylenedianiline	101779			10
Methylene diphenyl diisocyanate (MDI)	101688			5,000
Methyl ethyl ketone (MEK) (I,T)	78933		U159	5,000
Methyl ethyl ketone peroxide (R,T)	1338234		U160	10
Methyl hydrazine	60344	500	P068	10
Methyl iodide	74884		U138	100
Methyl isobutyl ketone	108101		U161	5,000
Methyl isocyanate	624839	500	P064	10
Methyl isothiocyanate	556616	500		1
2-Methyllactonitrile	75865		P069	10
Methyl mercaptan	74931	500	U153	100
Methyl methacrylate (I,T)	80626		U162	1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Methyl parathion	298000		P071	100
Methyl phenkapton	3735237	500		1
Methyl phosphonic dichloride	676971	100		1
4-Methyl-2-pentanone (I)	108101		U161	5,000
Methyl tert-butyl ether	1634044			1,000
Methyl thiocyanate	556649	10,000		1
Methylthiouracil	56042		U164	10
Methyl vinyl ketone	78944	10		1
Methylmercuric dicyanamide	502396	500/10,000		1
Methyltrichlorosilane	75796	500		1
Metocarb	1129415	100/10,000		
Mevinphos	7786347	500		10
Mexacarbate	315184	500/10,000		1,000
Mitomycin C	50077	500/10,000	U010	10
MNNG	70257		U163	10
Monocrotophos	6923224	10/10,000		1
Monoethylamine	75047			100
Monomethylamine	74895			100
Muscimol	2763964	500/10,000	P007	1,000
Mustard gas	505602	500		1
Naled	300765			10
5,12-Naphthaacenedione, 8-acetyl-10-[3 amino-2,3, 6-tri-deoxy-alpha-L-lyxo-hexopyranosyl)oxy]-7,8,9, 10-tetrahydro-6,8,11-trihydroxy-1-methoxy-, (8S-cis)-	20830813		U059	10
1-Naphthalenamine	134327		U167	100
2-Naphthalenamine (beta-Naphthylamine)	91598		U168	1
Naphthalenamine, N,N'-bis(2-chloroethyl)-	494031		U026	100
Naphthalene	91203		U165	100
Naphthalene, 2-chloro-	91587		U047	5,000
1,4-Naphthalenedione	130154		U166	5,000
2,7-Naphthalenedisulfonic acid, 3,3' [(3,3'-dimethyl-(1,1'-biphenyl)-4,4'-dryl)-bis(azo)] bis(5-amino-4-hydroxy)-tetrasodium salt	72571		U236	10
Naphthenic acid	1338245			100
1,4-Naphthoquinone	130154		U166	5,000
alpha-Naphthylamine	134327		U167	100
beta-Naphthylamine (2-Naphthalenamine)	91598		U168	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
alpha-Naphthylthiourea	86884		P072	100
Nickel++	7440020			100
Nickel ammonium sulfate	15699180			100
Nickel carbonyl	13463393	1	P073	10
Nickel carbonyl Ni(CO)4, (T-4)-	13463393		P073	10
Nickel chloride	7718549 37211055			100
Nickel cyanide	557197		P074	10
Nickel hydroxide	12054487			10
Nickel nitrate	14216752			100
Nickel sulfate	7786814			100
Nicotine & salts	54115	100	P075	100
Nicotine sulfate	65305	100/10,000		1
Nitric acid	7697372	1,000		1,000
Nitric acid, thallium(1+) salt	10102451		U217	100
Nitric oxide	10102439	100	P076	10
p-Nitroaniline	100016		P077	5,000
Nitrobenzene (I,T)	98953	10,000	U169	1,000
4-Nitrobiphenyl	92933			10
Nitrocyclohexane	1122607	500		1
Nitrogen dioxide	10102440 10544726	100	P078	10
Nitrogen oxide	10102439		P076	10
Nitroglycerine	55630		P081	10
Nitrophenol (mixed)	25154556			100
m-Nitrophenol	554847			100
o-Nitrophenol (2)	88755			100
p-Nitrophenol (4)	100027		U170	100
2-Nitropropane (I,T)	79469		U171	10
N-Nitrosodi-n-butylamine	924163		U172	10
N-Nitrosodiethanolamine	1116547		U173	1
N-Nitrosodiethylamine	55185		U174	1
N-Nitrosodimethylamine	62759	1,000	P082	10
N-Nitrosodiphenylamine	86306			100
N-Nitroso-N-ethylurea	759739		U176	1
N-Nitroso-N-methylurea	684935		U177	1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
N-Nitroso-N-methylurethane	615532		U178	1
N-Nitrosomethylvinylamine	4549400		P084	10
N-Nitrosomorpholine	59892			1
N-Nitrosopiperidine	100754		U179	10
N-Nitrosopyrrolidine	930552		U180	1
Nitrotoluene	1321126			1,000
m-Nitrotoluene	99081			
o-Nitrotoluene	88722			
p-Nitrotoluene	99990			
5-Nitro-o-toluidine	99558		U181	100
Norbromide	991424	100/10,000		1
Octamethylpyrophosphoramide	152169		P085	100
Organorhodium complex (PMN-82-147)	0	10/10,000		1
Osmium tetroxide	20816120		P087	1,000
Ouabain	630604	100/10,000		1
7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid	145733		P088	1,000
Oxamyl	23135220	100/10,000	P194	1
1,2-Oxathiolane, 2,2-dioxide	1120714		U193	10
2H-1,3,2-Oxazaphosphorin-2-amine, N,N bis (2-chloroethyl)tetrahydro-, 2-oxide	50180		U058	10
Oxetane, 3,3-bis(chloromethyl)-	78717	500		1
Oxirane (I,T)	75218		U115	10
Oxiranecarboxyaldehyde	765344		U126	10
Oxirane, (chloromethyl)-	106898		U041	100
Oxydisulfoton	2497076	500		1
Ozone	10028156	100		1
Paraformaldehyde	30525894			1,000
Paraldehyde	123637		U182	1,000
Paraquat	1910425	10/10,000		1
Paraquat methosulfate	2074502	10/10,000		1
Parathion	56382	100	P089	10
Parathion-methyl	298000	100/10,000		100
Paris green	12002038	500/10,000		100
PCBs	1336363			

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Aroclor 1016	12674112			1
Aroclor 1221	11104282			1
Aroclor 1232	11141165			1
Aroclor 1242	53469219			1
Aroclor 1248	12672296			1
Aroclor 1254	11097691			1
Aroclor 1260	11096825			1
PCNB (Pentachloronitrobenzene)	82688		U185	100
Pentaborane	19624227	500		1
Pentachlorobenzene	608935		U183	10
Pentachloroethane	76017		U184	10
Pentachlorophenol	87865		U242	10
Pentachloronitrobenzene (PCNB)	82688		U185	100
Pentadecylamine	2570265	100/10,000		1
Paracetic acid	79210	500		1
1,3-Pentadiene (I)	504609		U186	100
Perachloroethylene	127184		U210	100
Perchloromethylmercaptan	594423	500		100
Phenacetin	62442		U187	100
Phenanthrene	85018			5,000
Phenol	108952	500/10,000	U188	1,000
Phenol, 2-chloro-	95578		U048	100
Phenol, 4-chloro-3-methyl-	59507		U039	5,000
Phenol, 2-cyclohexyl-4,6-dinitro-	131895		P034	100
Phenol, 2,4-dichloro-	120832		U081	100
Phenol, 2,6-dichloro-	87650		U082	100
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	56531		U089	1
Phenol, 2,4-dimethyl-	105679		U101	100
Phenol, 2,4-dinitro-	51285		P048	10
Phenol, methyl-	1319773		U052	1,000
m-Cresol	108394			
o-Cresol	95487			
p-Cresol	106445			
Phenol, 2-methyl-4,6-dinitro-and salts	534521		P047	10
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	70304		U132	100
Phenol, 2,2'-thiobis(4-chloro-6-methyl)-	4418660	100/10,000		1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Phenol, 2-(1-methylpropyl)-4,6-dinitro	88857		P020	1,000
Phenol, 3-(1-methylethyl)-, methylcarbamate	64006	500/10,000		1
Phenol, 4-nitro-	100027		U170	100
Phenol, pentachloro-	87865		U242	10
Phenol, 2,3,4,6-tetrachloro-	58902		U212	10
Phenol, 2,4,5-trichloro-	95954		U230	10
Phenol, 2,4,6-trichloro-	88062		U231	10
Phenol, 2,4,6-trinitro-, ammonium salt	131748		P009	10
Phenoxarsine, 10,10'-oxydi-	58366	500/10,000		1
L-Phenylalanine, 4-[bis(2-chloroethyl)aminol]	148823		U150	1
Phenyl dichloroarsine	696286	500		1
1,10-(1,2-Phenylene)pyrene	193395		U137	100
p-Phenylenediamine	106503			5,000
Phenylhydrazine hydrochloride	59881	1,000/10,000		1
Phenylmercury acetate	62384	500/10,000	P092	100
Phenylsilatrane	2097190	100/10,000		1
Phenylthiourea	103855	100/10,000	P093	100
Phorate	298022	10	P094	10
Phosacetim	4104147	100/10,000		1
Phosfolan	947024	100/10,000		1
Phosgene	75445	10	P095	10
Phosmet	732116	10/10,000		1
Phosphamidon	13171216	100		1
Phosphine	7803512	500		100
Phosphorothioic acid, o,o-Dimethyl-s (2-Methylthio) ethyl ester	2587908	500		1
Phosphorothioic acid, methyl-, o-ethyl o-(4-(methylthio)phenyl) ester	2703131	500		1
Phosphorothioic acid, methyl-, s-(2-(bis(1-methylethyl)amino)ethyl o-ethyl ester	50782699	100		1
Phosphorothioic acid, methyl-, 0-(4-nitrophenyl) o-phenyl ester	2665307	500		1
Phosphoric acid	7664382			5,000
Phosphoric acid, diethyl 4-nitrophenyl ester	311455		P041	100
Phosphoric acid, dimethyl 4-(methylthio) phenyl ester	3254635	500		1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Phosphoric acid, lead(2+) salt (2:3)	7446277	500	U145	10
Phosphorodithioic acid, O,O-diethyl S-[2 (ethylthio)ethyl]ester	298044		P039	1
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	298022		P094	10
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582		U087	5,000
Phosphorodithoic acid, O,O-dimethyl S-[2(methyl-amino)-2-oxoethyl] ester	60515		P044	10
Phosphorofluondic acid, bis(1-methylethyl) ester	55914		P043	100
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382		P089	10
Phosphorothioic acid, O,[4-[(dime-thylamino)sulfonyl]phenyl]O,O-dimethyl ester	52857		P097	1,000
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298000		P071	100
Phosphorothioic acid, 0,0-diethyl 0 pyrazinyl ester	297972		P040	100
Phosphorus	7723140	100		1
Phosphorus oxycloride	10025873	500		1,000
Phosphorous pentachloride	10026138	500		1
Phosphorus pentasulfide (R)	1314803		U189	100
Phosphorus pentoxide	1314563	10		1
Phosphorus trichloride	7719122	1,000		1,000
Phthalic anhydride	85449		U190	5,000
Physostigmine	57476	100/10,000	P204	1
Phosostigmine, salicylate (1:1)	57647	100/10,000		1
2-Picoline	109068		U191	5,000
Picotoxin	124878	500/10,000		1
Piperidine	110894	1,000		1
Piperidine, 1-nitroso-	100754		U179	10
Pirimifos-ethyl	23505411	1,000		1
Plumbane, tetraethyl-	78002		P110	10
Polychlorinated biphenyls (See PCBs or Aroclor)	1336363			1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Potassium arsenate	7784410			1
Potassium arsenite	10124502	500/10,000		1
Potassium bichromate	7778509			10
Potassium chromate	7789006			10
Potassium cyanide	151508	100	P098	10
Potassium hydroxide	1310583			1,000
Potassium permanganate	7722647			100
Potassium silver cyanide	506616	500	P099	1
Promecarb	2631370	500/10,000		1
Pronamide	23950585		U192	5,000
Propanal, 2-methyl-2-(methylthio)-, O-[(methylamino)carbonyl]oxime	116063		P070	1
1-Propanamine (I,T)	107108		U194	5,000
1-Propanamine, N-propyl-	142847		U110	5,000
1-Propanamine, N-nitroso-N-propyl-	621647		U111	10
Propane, 1,2-dibromo-3-chloro	96128		U066	1
Propane, 2-nitro- (I,T)	79469		U171	10
1,3-Propane sultone	1120714		U193	10
Propane 1,2-dichloro-	78875		U083	1,000
Propanedinitrile	109773		U149	1,000
Propanenitrile	107120		P101	10
Propanenitrile, 3-chloro-	542767		P027	1,000
Propanenitrile, 2-hydroxy-2-methyl-	75865		P069	10
Propane, 2,2'-oxybis[2-chloro-	108601		U027	1,000
1,2,3-Propanetnol, trinitrate- (R)	55630		P081	10
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727		U235	10
1-Propanol, 2-methyl- (I,T)	78831		U140	5,000
2-Propanone (I)	67641		U002	5,000
2-Propanone, 1-bromo-	598312		P017	1,000
Propargite	2312358			10
Propargyl alcohol	107197		P102	1,000
Propargyl bromide	106967	10		1
2-Propenal	107028		P003	1
2-Propenamide	79061		U007	5,000
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717		U243	1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
1-Propene, 1,3-dichloro-	542756		U084	100
2-Propenenitrile	107131		U009	100
2-Propenenitrile, 2-methyl- (I,T)	126987		U152	1,000
2-Propenoic acid (I)	79107		U008	5,000
2-Prepenoic acid, ethyl ester (I)	140885		U113	1,000
2-Prepenoic acid, 2-methyl-, ethyl ester	97632		U118	1,000
2-Prepenoic acid, 2-methyl-, methyl ester (I,T)	80626		U162	1,000
2-Propen-1-o1	107186		P005	100
Propiolactone, beta-	57578	500		1
Propionaldehyde	123386			1,000
Propionic acid	79094			5,000
Propionic acid, 2-(2,4,5-trichlorophenoxyl)-	93721		U233	100
Propionic anhydride	123626			5,000
Propoxor (Baygon)	114261		U411	100
Propionitrile	107120	500		10
Propionitrile, 3-chloro-	542767	1,000		1,000
Propiophenone, 1, 4-amino phenyl	70699	100/10,000		1
n-Propylamine	107108		U194	5,000
Propyl chloroformate	109615	500		1
Propylene dichloride	78875		U083	1,000
Propylene oxide	75569	10,000		100
1,2-Propylenimine	75558	10,000	P067	1
2-Propyn-1-o1	107197		P102	1,000
Prothoate	2275185	100/10,000		1
Pyrene	129000	1,000/10,000		5,000
Pyrethrins	121299 121211 8003347			1
3,6-Pyridazinedione, 1,2-dihydro-	123331		U148	5,000
4-Pyridinamine	504245		P008	1,000
Pyridine	110861		U196	1,000
Pyridine, 2-methyl-	109068		U191	5,000
Pyridine, 2-methyl-5-vinyl-	140761	500		1
Pyridine, 4-amino-	504245	500/10,000		1,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Pyridine, 4-nitro-, 1-oxide	1124330	500/10,000		1
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	54115		P075	100
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66751		U237	10
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	56042		U164	10
Pyriminil	53558251	100/10,000		1
Pyrrolidine, 1-nitroso-	930552		U180	1
Quinoline	91225			5,000
Quinone (p-Benzoquinone)	106514		U197	10
Quintobenzene	82688		U185	100
Reserpine	50555		U200	5,000
Resorcinol	108463		U201	5,000
Saccharin and salts	81072		U202	100
Salcomine	14167181	500/10,000		1
Sarin	107448	10		1
Safrole	94597		U203	100
Selenious acid	7783008	1,000/10,000	U204	10
Selenious acid, dithallium (1+) salt	12039520		P114	1,000
Selenium ++	7782492			100
Selenium dioxide	7446084		U204	10
Selenium oxychloride	7791233	500		1
Selenium sulfide (R,T)	7488564		U205	10
Selenourea	630104		P103	1,000
Semicarbazide hydrochloride	563417	1,000/10,000		1
L-Serine, diazoacetate (ester)	115026		U015	1
Silane, (4-aminobutyl)diethoxymethyl-	3037727	1,000		1
Silver ++	7440224			1,000
Silver cyanide	506649		P104	1
Silver nitrate	7761888			1
Silvex (2,4,5-TP)	93721		U233	100
Sodium	7440235			10
Sodium arsenate	7631892	1,000/10,000		1
Sodium arsenite	7784465	500/10,000		1
Sodium azide	26628228	500	P105	1,000
Sodium bichromate	10588019			10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Sodium bifluoride	1333831			100
Sodium bisulfite	7631905			5,000
Sodium cacodylate	124652	100/10,000		1
Sodium chromate	7775113			10
Sodium cyanide	143339	100	P106	10
Sodium dodecylbenzenesulfonate	25155300			1,000
Sodium fluoride	7681494			1,000
Sodium fluoroacetate	62748	10/10,000		10
Sodium hydrosulfide	16721805			5,000
Sodium hydroxide	1310732			1,000
Sodium hypochlorite	7681529 10022705			100
Sodium methylate	124414			1,000
Sodium nitrite	7632000			100
Sodium prentachlorophenate	131522	100/10,000		1
Sodium phosphate, dibasic	7558794 10039324 10140655			5,000
Sodium phosphate, tribasic	7601549 7758294 7785844 10101890 10124568 10361894			5,000
Sodium selenate	13410010	100/10,000		1
Sodium selenite	10102188 7782823	100/10,000		100
Sodium tellurite	10102202	500/10,000		1
Stannane, acetoxytriphenyl	900958	500/10,000		1
Streptozotocin	18883664		U206	1
Strontium chromate	7789062			10
Strychnidin-10-one	57249		P108	10
Strychnidin-10-one, 2,3-dimethoxy-	357573		P018	100
Strychnine, & salts	572494	100/10,000	P108	10
Strychnine sulfate	60413	100/10,000		1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Styrene	100425			1,000
Styrene oxide	96093			100
Sulfotep	3689245	500		100
Sulfoxide, 3-chloropropyl octyl	3569571	500		1
Sulfur monochloride	12771083			1,000
Sulfur dioxide	7446095	500		1
Sulfur phosphide (R)	1314803		U189	100
Sulfur tetrafluoride	7783600	100		1
Sulfur trioxide	7446119	100		1
Sulfuric acid	7664939 8014957	1,000		1,000
Sulfuric acid, dithallium (1+) salt	7446186 10031591		P115	100
Sulfuric acid, dimethyl ester	77781		U103	100
Tabun	77816	10		1
2,4,5-T acid	93765		U232	1,000
2,4,5-T amines	2008460 1319728 3813147 6369966 6369977			5,000
Tellurium	13494809	500/10,000		1
Tellurium hexafluoride	7783804	100		1
2,4,5-T esters	93798 1928478 2545597 25168154 61792072			1,000
2,4,5-T salts	13560991			1,000
2,4,5-T	93765		U232	1,000
TDE (Dichloro diphenyl dichloroethane)	72548		U060	1
TEPP (Tetraethyl ester diphosphoric acid)	107493	100		10
Terbufos	13071799	100		1
1,2,4,5-Tetrachlorobenzene	95943		U207	5,000
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746016			1

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
1,1,1,2-Tetrachloroethane	630206		U208	100
1,1,2,2-Tetrachloroethane	79345		U209	100
Tetrachloroethene	127184		U210	100
Tetrachloroethylene	127184		U210	100
2,3,4,6-Tetrachlorophenol	58902		U212	10
Tetraethyl lead	78002	100	P110	10
Tetraethyl pyrophosphate	107493		P111	10
Tetraethyldithiopyrophosphate	3689245		P109	100
Tetraethyltin	597648	100		1
Tetramethyllead	75741	100		1
Tetrahydrofuran (I)	109999		U213	1,000
Tetranitromethane (R)	509148	500	P112	10
Tetraphosphoric acid, hexaethyl ester	757584		P062	100
Thallic oxide	1314325		P113	100
Thallium ++	7440280			1,000
Thallium acetate	563688		U214	100
Thallium carbonate	6533739		U215	100
Thallium chloride	7791120		U216	100
Thallium nitrate	10102451		U217	100
Thallium oxide	1314325		P113	100
Thallium selenite	12039520		P114	1,000
Thallium sulfate	7446186 10031591	100/10,000	P115	100
Thallous carbonate (Thallium (I) carbonate)	6533739	100/10,000	U215	100
Thallous chloride (Thallium (I) chloride)	7791120	100/10,000	U216	100
Thallous malonate (Thallium (I) malonate)	2757188	100/10,000		1
Thallous sulfate (Thallium (I) sulfate)	7446186	100/10,000	P115	100
Thioacetamide	62555		U218	10
Thiocarbazide	2231574	1,000/10,000		1
Thiodiphosphoric acid, tetraethyl ester	3689245		P109	100
Thiofanox	39196184	100/10,000	P045	100
Thioimidodicarbonic diamide [(H2N)C(S)] 2NH	541537		P049	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Thiomethanol (I,T)	74931		U153	100
Thionazin	297972	500		100
Thioperoxydicarbonic diamide [(H2N)C(S)] 2S2, tetra-methyl-	137268		U244	10
Thiophenol	108985	500	P104	100
Thiosemicarbazide	79196	100/10,000	P116	100
Thiourea	62566		U219	10
Thiourea, (2-chlorophenyl)-	5344821	100/10,000	P026	100
Thiourea, (2-methylphenyl)-	614788	500/10,000		1
Thiourea, 1-naphthalenyl-	86884		P072	100
Thiourea, phenyl-	103855		P093	100
Thiram	137268		U244	10
Titanium tetrachloride	7550450	100		1,000
Toluene	108883		U220	1,000
Toluenediamine	95807 496720 823405 25376458		U221	10
Toluene diisocyanate (R,T)	584849 91087 26471625	500 100	U223	100 100
o-Toluidine	95534		U328	100
p-Toluidine	106490		U353	100
o-Toluidine hydrochloride	636215		U222	100
Toxaphene	8001352		P123	1
2,4,5-TP acid	93721		U233	100
2,4,5-TP acid esters	32534955			100
1H-1,2,4-Triazol-3-amine	61825		U011	10
Trans-1,4-dichlorobutene	110576	500		1
Triamiphos	1031476	500/10,000		1
Triazofos	24017478	500		1
Trichloroacetyl chloride	76028	500		1
Trichlorfon	52686			100
1,2,4-Trichlorobenzene	120821			100
1,1,1-Trichloroethane	71556		U226	1,000
1,1,2-Trichloroethane	79005		U227	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	**CAS No.1**	**Threshold Planning Quantity (Pounds)2**	**USEPA HW No. 3**	**RQ (Pounds)4**
Trichloroethene	79016		U228	100
Trichloroethylene	79016		U228	100
Trichloroethylsilane	115219	500		1
Trichloronate	327980	500		1
Trichloromethanesulfenyl chloride	594423		P118	100
Trichloromonofluoromethane	75694		U121	5,000
Trichlorophenol	21567822			10
2,3,4-Trichlorophenol	15950660			
2,3,5-Trichlorophenol	933788			
2,3,6-Trichlorophenol	933755			
2,4,5-Trichlorophenol	95954		U230	10
2,4,6-Trichlorophenol	88062		U231	10
3,4,5-Trichlorophenol	609198			
Trichlorophenylsilane	98135	500		1
Trichloro(chloromethyl)silane	1558254	100		1
Trichloro(dichlorophenyl)silane	27137855	500		1
Triethanolamine dodecylbenzene-sulfonate	27323417			1,000
Triethoxysilane	998301	500		1
Trifluralin	1582098			10
Triethylamine	121448			5,000
Trimethylamine	75503			100
Trimethylchlorsilane	75774	1,000		1
2,2,4-Trimethylpentane	540841			1,000
Trimethylolpropane phosphite	824113	100/10,000		1
Trimethyiltin chloride	1066451	500/10,000		1
1,3,5-Trinitrobenzene (R,T)	99354		U234	10
1,3,5-Trioxane, 2,4,6-trimethyl-	123637		U182	1,000
Triphenyltin chloride	639587	500/10,000		1
Tris(2-chloroethyl)amine	555771	100		1
Tris(2,3-dibromopropyl) phosphate	126727		U235	10
Trypan blue	72571		U236	10
Unlisted Hazardous Wastes Characteristic of **Ignitability**	NA		D001	100
Unlisted Hazardous Wastes Characteristic of **Corrosivity**	NA		D002	100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	**CAS No.1**	**Threshold Planning Quantity (Pounds)2**	**USEPA HW No. 3**	**RQ (Pounds)4**
Unlisted Hazardous Wastes Characteristic of **Reactivity**	NA		D003	100
Unlisted Hazardous Wastes Characteristic of **Toxicity**				
Arsenic			D004	1
Barium			D005	1,000
Benzene			D018	10
Cadmium			D006	10
Carbon Tetrachloride			D019	10
Chlordane			D020	1
Chlorobenzene			D021	100
Chloroform			D022	10
Chromium			D007	10
o-Cresol			D023	100
m-Cresol			D024	100
p-Cresol			D025	100
Cresol			D026	100
2,4-D (Dichlorophenoxyacetic acid)			D016	100
1,4-Dichlorobenzene			D027	100
1,2-Dichloroethane			D028	100
1,1-Dichloroethylene			D029	100
2,4-Dinitrotoluene			D030	10
Endrin			D012	1
Heptachlor (and epoxide)			D031	1
Hexachlorobenzene			D032	10
Hexachlorobutadiene			D033	1
Hexachloroethane			D034	100
Lead			D008	10
Lindane			D013	1
Mercury			D009	1
Methoxychlor			D014	1
Methyl ethyl ketone			D035	5,000
Nitrobenzene			D036	1,000
Pentachlorophenol			D037	10
Pyridine			D038	1,000
Selenium			D010	10

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
Silver			D011	1
Tetrachloroethylene			D039	100
Toxaphene			D015	1
Trichloroethylene			D040	100
2,4,5 Trichlorophenol			D041	10
2,4,5-TP			D017	100
Vinyl chloride			D043	1
Uracil mustard	66751		U237	10
Uranyl acetate	541093			100
Uranyl nitrate	10102064 36478769			100
Urea, N-ethyl-N-nitroso	759739		U176	1
Urea, N-methyl-N-nitroso	684935		U177	1
Urethane (Carbamic acid ethyl ester)	51796		U238	100
Valinomycin	2001958	1,000/10,000		1
Vanadic acid, ammonium salt	7803556		P119	1,000
Vanadic oxide V_20_5	1314621		P120	1,000
Vanadic pentoxide	1314621		P120	1,000
Vanadium pentoxide	1314621	100/10,000		1,000
Vanadyl sulfate	27774136			1,000
Vinyl chloride	75014		U043	1
Vinyl acetate	108054			5,000
Vinyl acetate monomer	108054	1,000		5,000
Vinylamine, N-methyl-N-nitroso-	4549400		P084	10
Vinyl bromide	593602			100
Vinylidene chloride	75354		U078	100
Warfarin, & salts, when present at concentrations greater than 0.3%	81812	500/10,000	P001	100
Warfarin sodium	129066	100/10,000		100
Xylene (mixed)	1330207		U239	100
m-Benzene, dimethyl	108383			1,000
o-Benzene, dimethyl	95476			1,000
p-Benzene, dimethyl	106423			100

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
Xylenol	1300716			1,000
Xylylene dichloride	28347139	100/10,000		1
Yohimban-16-carboxylic acid, 11,17 dimethoxy-18-[(3,4,5-trimethoxy-benzoyl)oxy]-, methyl ester (3-beta, 16-beta,17-alpha,18-beta,20-alpha)-	50555		U200	5,000
Zinc ++	7440666			1,000
Zinc acetate	557346			1,000
Zinc ammonium chloride	52628258 14639975 14639986			1,000
Zinc borate	1332076			1,000
Zinc bromide	7699458			1,000
Zinc carbonate	3486359			1,000
Zinc chloride	7646857			1,000
Zinc cyanide	557211		P121	10
Zinc, dichloro(4,4-dimethyl-5((((methyl-amino)carbonyl) oxy)imino)pentaenitrile)-,(t-4)-	58270089	100/10,000		1
Zinc fluoride	7783495			1,000
Zinc formate	557415			1,000
Zinc hydrosulfite	7779864			1,000
Zinc nitrate	7779886			1,000
Zinc phenosulfonate	127822			5,000
Zinc phosphide	1314847	500	P122	100
Zinc phosphide Zn_3P_2, when present at concentrations greater than 10%	1314847		P122	100
Zinc silicofluoride	16871719			5,000
Zinc sulfate	7733020			1,000
Zirconium nitrate	13746899			5,000
Zirconium potassium fluoride	16923958			1,000
Zirconium sulfate	14644612			5,000
Zirconium tetrachloride	10026116			5,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
F001			**F001**	**10**
The following spent halogenated solvents used in degreasing: all spent solvent mixtures/blends used in degreasing containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those solvents listed in F002, F004, and F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
(a) Tetrachloroethylene	127184		U210	100
(b) Trichloroethylene	79016		U228	100
(c) Methylene chloride	75092		U080	1,000
(d) 1,1,1-Trichloroethane	71556		U226	1,000
(e) Carbon tetrachloride	56235		U211	10
(f) Chlorinated fluorocarbons	NA			5,000
F002			**F002**	**10**
The following spent halogenated solvents: all spent solvent mixtures/blends containing, before use, a total of 10 percent or more (by volume) of one or more of the above halogenated solvents or those listed in F001, F004, or F005; and still bottoms from the recovery of these spent solvents and spent solvent mixtures.				
(a) Tetrachloroethylene	127184		U210	100
(b) Methylene chloride	75092		U080	1,000
(c) Trichloroethylene	79016		U228	100
(d) 1,1,1-Trichloroethane	71556		U226	1,000
(e) Chlorobenzene	108907		U037	100
(f) 1,1,2-Trichloro-1,2,2 trifluoroethane	76131			5,000
(g) o-Dischlorobenzene	95501		U070	100
(h) Trichlorofluoromethane	75694		U121	5,000
(i) 1,1,2-Trichloroethane	79005		U227	100
F003			**F003**	**100**
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				
(a) Xylene	1330207			1,000
(b) Acetone	67641			5,000
(c) Ethyl acetate	141786			5,000
(d) Ethylbenzene	100414			1,000
(e) Ethyl ether	60297			100
(f) Methyl isobutyl ketone	108101			5,000
(g) n-Butyl alcohol	71363			5,000
(h) Cyclohexanone	108941			5,000
(i) Methanol	67561			5,000

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
F004			**F004**	**100**
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				
(a) Cresols/Cresylic acid	1319773		U052	100
(b) Nitrobenzene	98953		U169	1,000
F005			**F005**	**100**
The following spent non-halogenated solvents and the still bottoms from the recovery of these solvents:				
(a) Toluene	108883		U220	1,000
(b) Methyl ethyl ketone	78933		U159	5,000
(c) Carbon disulfide	75150		P022	100
(d) Isobutanol	78831		U140	5,000
(e) Pyndine	110861		U196	1,000
F006			**F006**	**10**
Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum, (2) tin plating on carbon steel, (3) zinc plating (segregated basis) on carbon steel, (4) aluminum or zinc-aluminum plating on carbon steel, (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel, and (6) chemical etching and milling of aluminum.				
F007			**F007**	**10**
Spent cyanide plating bath solutions from electroplating operations.				
F008			**F008**	**10**
Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.				
F009			**F009**	**10**
Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.				
F010			**F010**	**10**
Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.				
F011			**F011**	**10**
Spent cyanide solution from salt bath pot cleaning from metal heat treating operations.				
F012			**F012**	**10**
Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.				
F019			**F019**	**10**
Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can washing when such phosphating is an exclusive coating process.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
F020			**F020**	**1**
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri-or-tetrachlorophenol, or of intermediates used to produce their pesticide derivatives. (This listing does not include wastes from the production of hexachlorophene from highly purified 2,4,5-trichlorophenol.)				
F021			**F021**	**1**
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of pentachlorophenol, or of intermediates used to produce its derivatives.				
F022			**F022**	**1**
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-, penta-, or hexachlorobenzenes under alkaline conditions.				
F023			**F023**	**1**
Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tri- and tetrachlorophenols. (This listing does not include wastes from equipment used only for the production or use of hexa-chlorophene from highly purified, 2,4,5-tri-chlorophenol.)				
F024			**F024**	**1**
Wastes, including but not limited to distillation residues, heavy ends, tars, and reactor cleanout wastes, from the production of chlorinated aliphatic hydrocarbons, having carbon content from one to five, utilizing free radical catalyzed processes. (This listing does not include light ends, spent filters and filter aids, spent dessicants(sic), wastewater, wastewater treatment sludges, spent catalysts, and wastes listed in Section 261.32.)				
F025			**F025**	**1**
Condensed light ends, spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution.				
F026			**F026**	**1**
Wastes (except wastewater and spent carbon from hydrogen chlorice purification) from the production of materials on equipment previously used for the manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of tetra-penta-, or hexachlorobenzene under alkaline conditions.				
F027			**F027**	**1**
Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-tri-chlorophenol as the sole component.)				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. 3	RQ (Pounds)[4]
F028			**K028**	**1**
Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Waste Numbers F020, F021, F022, F023, F026, and F027.				
F032			**F032**	**1**
Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used clorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with 261.35 of this chapter or potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.				
F034			**F034**	**1**
Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.				
F035			**F035**	**1**
Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.				
F037			**F037**	**1**
Petroleum refinery primary oil/water/solids separation sludge--any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/solids separators; tanks and impoundment; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as defined in 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment unites) and K051 wastes are not included in this listing.				
F038			**F038**	**1**
Petroleum refinery secondary (emulsified) oil/water/solids separation sludge--any sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from once-through non-contact cooling waters segregated from treatment from other process or oil cooling wastes, sludges and floats generated in aggressive biological treatment units as defined in 261.31(b) (2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and F037, K048, and K051 wastes are not included in this listing.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K001			**K001**	**1**
Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.				
K002			**K002**	**10**
Wastewater treatment sludge from the production of chrome yellow and orange pigments.				
K003			**K003**	**10**
Wastewater treatment sludge from the production of molyodate orange pigments.				
K004			**K004**	**10**
Wastewater treatment sludge from the production of zinc yellow pigments.				
K005			**K005**	**10**
Wastewater treatment sludge from the production of chrome green pigments.				
K006			**K006**	**10**
Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).				
K007			**K007**	**10**
Wastewater treatment sludge from the production of iron blue pigments.				
K008			**K008**	**10**
Oven residue from the production of chrome oxide green pigments.				
K009			**K009**	**10**
Distillation bottoms from the production of acetaldehyde from ethylene.				
K010			**K010**	**10**
Distillation side cuts from the production of acetaldehyde from ethylene.				
K011			**K011**	**10**
Bottom stream from the wastewater stripper in the production of acrylonitrile.				
K013			**K013**	**10**
Bottom stream from the acetonitrile column in the production of acrylonitrile.				
K014			**K014**	**5,000**
Bottoms from the acetonitrile purification column in the production of acrylonitrile.				
K015			**K015**	**10**
Still bottoms from the distillation of benzyl chloride.				
K016			**K016**	**1**
Heavy ends or distillation residues from the production of carbon tetrachloride.				
K017			**K017**	**10**
Heavy ends (still bottoms) from the purification column in the production of epi-chlorohydrin.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K018			**K018**	**1**
Heavy ends from the fractionation column in ethyl chloride production.				
K019			**K019**	**1**
Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.				
K020			**K020**	**1**
Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.				
K021			**K021**	**10**
Aqueous spent antimony catalyst waste from fluoromethanes production.				
K022			**K022**	**1**
Distillation bottom tars from the production of phenol/acetone from cumene.				
K023			**K023**	**5,000**
Distillation light ends from the production of ophthalic anhydride from naphthalene.				
K024			**K024**	**5,000**
Distillation bottoms from the production of phthalic anhydride from naphthalene.				
K025			**K025**	**10**
Distillation bottoms from the production of nitrobenzene by the nitration of benzene.				
K026			**K026**	**1,000**
Stripping still tails from the production of methyl ethyl pyridines.				
K027			**K027**	**10**
Centrifuge and distillation residues from toluene diisocyanate production.				
K028			**K028**	**1**
Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.				
K029			**K029**	**1**
Waste from the product steam stripper in the production of 1,1,1-trichloroethane.				
K030			**K030**	**1**
Column bottoms or heavy ends from the combined production of trichloroethylene and perchloroethylene.				
K031			**K031**	**1**
By-product salts generated in the production of MSMA and cacodylic acid.				
K032			**K032**	**10**
Wastewater treatment sludge from the production of chlordane.				
K033			**K033**	**10**
Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.				
K034			**K034**	**10**
Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No.[3]	RQ (Pounds)[4]
K035			**K035**	**1**
Wastewater treatment sludges generated in the production of creosote.				
K036			**K036**	**1**
Still bottoms from toluene reclamation distillation in the production of disulfoton.				
K037			**K037**	**1**
Wastewater treatment sludges from the production of disulfoton.				
K038			**K038**	**10**
Wastewater from the washing and stripping of phorate production.				
K039			**K039**	**10**
Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.				
K040			**K040**	**10**
Wastewater treatment sludge from the production of phorate.				
K041			**K041**	**1**
Wastewater treatment sludge from the production of toxaphene.				
K042			**K042**	**10**
Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.				
K043			**K043**	**10**
2,6-Dichlorophenol waste from the production of 2,4-D.				
K044			**K044**	**10**
Wastewater treatment sludges from the manufacturing and processing of explosives.				
K045			**K045**	**10**
Spent carbon from the treatment of wastewater containing explosives.				
K046			**K046**	**10**
Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.				
K047			**K047**	**10**
Pink/red water from TNT operations.				
K048			**K048**	**10**
Dissolved air flotation (DAF) float from the petroleum refining industry.				
K049			**K049**	**10**
Slop oil emulsion solids from the petroleum refining industry.				
K050			**K050**	**10**
Heat exchanger bundle cleaning sludge from the petroleum refining industry.				
K051			**K051**	**10**
API separator sludge from the petroleum refining industry.				
K052			**K052**	**10**
Tank bottoms (leaded) from the petroleum refining industry.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K060			**K060**	**1**
Ammonia still lime sludge from coking operations.				
K061			**K061**	**10**
Emission control dust/sludge from the primary production of steel in electric furnaces.				
K062			**K062**	**10**
Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).				
K064			**K064**	**10**
Acid plant blowdown slurry/sludge resulting from thickening of blowdown slurry from primary copper production.				
K065			**K065**	**10**
Surface impoundment solids contained in and dredged from surface impoundments at primary lead smelting facilities.				
K066			**K066**	**10**
Sludge from treatment of process wastewater and/or acid plant blowdown from primary zinc production.				
K069			**K069**	**10**
Emission control dust/sludge from secondary lead smelting.				
K071			**K071**	**1**
Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.				
K073			**K073**	**10**
Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.				
K083			**K083**	**100**
Distillation bottoms from aniline extraction.				
K084			**K084**	**1**
Wastewater treatment sludges generated during the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K085			**K085**	**10**
Distillation or fractionation column bottoms from the production of chlorobenzenes.				
K086			**K086**	**10**
Solvent washes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments, driers, soaps, and stabilizers containing chromium and lead.				
K087			**K087**	**100**
Decanter tank tar sludge from coking operations.				
K088			**K088**	**10**
Spent potliners from primary aluminum reduction.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K090			**K090**	**10**
Emission control dust or sludge from ferrochromiumsilicon production.				
K091			**K091**	**10**
Emission control dust or sludge from ferrochromium production.				
K093			**K093**	**5,000**
Distillation light ends from the production of phthalic anhydride from ortho-xylene.				
K094			**K094**	**5,000**
Distillation bottoms from the production of phthalic anhydride from ortho-xylene.				
K095			**K095**	**100**
Distillation bottoms from the production of 1,1,1-trichloroethane.				
K096			**K096**	**100**
Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.				
K097			**K097**	**1**
Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.				
K098			**K098**	**1**
Untreated process wastewater from the production of toxaphene.				
K099			**K099**	**10**
Untreated wastewater from the production of 2,4-D.				
K100			**K100**	**10**
Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.				
K101			**K101**	**1**
Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				
K102			**K102**	**1**
Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K103			**K103**	**100**
Process residues from aniline extraction from the production of aniline.				
K104			**K104**	**10**
Combined wastewater streams generated from nitrobenzene/aniline production.				
K105			**K105**	**10**
Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.				
K106			**K106**	**1**
Wastewater treatment sludge from the mercury cell process in chlorine production.				
K107			**K107**	**10**
Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazines.				
K108			**K108**	**10**
Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				
K109			**K109**	**10**
Spent filter cartridges from product purification from the production of 1.1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				
K110			**K110**	**10**
Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K111			**K111**	**10**
Product washwaters from the production of dinitrotoluene via nitration of toluene.				
K112			**K112**	**10**
Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K113			**K113**	**10**
Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K114			**K114**	**10**
Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K115			**K115**	**10**
Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.				
K116			**K116**	**10**
Organic condensate from the solvent recovery column in the production of toluene disocyanate via phosgenation of toluenediamine.				
K117			**K117**	**1**
Wastewater from the reaction vent gas scrubber in the production of ethylene bromide via bromination of ethene.				
K118			**K118**	**1**
Spent absorbent solids from purification of ethylene dibromide in the production of ethylene dibromide.				
K123			**K123**	**10**
Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenebisdithiocarbamic acid and its salts.				
K124			**K124**	**10**
Reactor vent scrubber water from the production of ethylene- bisdithiocarbamic acid and its salts.				
K125			**K125**	**10**
Filtration, evaporation, and centrifugation solids from the production of ethylenebisdithiocarbamic acid and its salts.				
K126			**K126**	**10**
Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylene-bisdithiocarbamic acid and its salts.				
K131			**K131**	**100**
Wastewater from the reactor and spent sulfuric acid from the acid dryer in the production of methyl bromide.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K132			**K132**	**1,000**
Spent absorbent and wastewater solids from the production of methyl bromide.				
K136			**K136**	**1**
Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.				
K141			**K141**	**1**
Process residues from the recovery of coal tar, including but not limited to, tar collecting sump residues from the production of coke or coal or the recovery of coke by-products produced from coal. This listing does not include K087 (decanter tank tar sludge from coking operations).				
K142			**K142**	**1**
Tar storage tank residues from the production of coke or from the recovery of coke by-products produced from coal.				
K143			**K143**	**1**
Process residues from the recovery of light oil, including, but not limited to, those generated in stills, decanters, and wash oil recovery units from the recovery of coke by-products produced from coal.				
K144			**K144**	**1**
Wastewater treatment sludges from light oil refining, including, but not limited to, intercepting or contamination sump sludges from the recovery of coke by-products produced from coal.				
K145			**K145**	**1**
Residues from naphthalene collection and recovery operations from the recovery of coke by-products produced from coal.				
K147			**K147**	**1**
Tar storage tank residues from coal tar refining.				
K148			**K148**	**1**
Residues from coal tar distillation, including, but not limited to, still bottoms.				
K149			**K149**	10
Distillation bottoms from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups. [This waste does not include still bottoms from the distillation of benzyl chloride.]				
K150			**K150**	10
Organiz residuals, exluding spent carbon adsorbent, from the spent chlorine gas and hydrocloric acid recovery processes assoaicted with the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.				

Table AP1.T4. List of Hazardous Waste/Substances/Materials--Continued (All notes appear at the end of the table.)

Hazardous Waste/Substance/Material	CAS No.[1]	Threshold Planning Quantity (Pounds)[2]	USEPA HW No. [3]	RQ (Pounds)[4]
K151			**K151**	10
Wastewater treatment sludges, excluding neutralizationand biological sludges, generated during the treatment of wastewaters from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.				
K157			**K157**	++
Wastewaters (including scrubber waters, condenser waters, washwaters, and separation waters) from the production of carbamates and carbamoyl oximes. (This listing does not include sludges derived from the treatment of these wastewaters.)				
K158			**K158**	++
Bag house dusts and filter/separation solids from the production of carbamates and carbamoyl oximes.				
K159			**K159**	++
Organics from the treatment of thiocarbamate wastes.				
K160			**K160**	++
Solids (including filter wastes, separation solids, and spent catalysts) from the production of thio-carbamates and solids from the treatment of thiocarbamate wastes.				
K161			**K161**	++
Purification solids (including filtration, evaporation, and centrifugation solids), bag house dust, and floor sweepings from the production of dithiocarbamate acids and their salts. (This listing does not include K125 or K126.)				

Notes:

1 Chemical Abstract Service (CAS) Registry Number.

2 Quantity in storage above which Environmental Executive Agent must be notified (See Chapter 5).

3 U.S. Environmental Protection Agency Hazardous Waste Number.

4 Reportable quantity release which requires notification (See Chapter 18).

++ No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is equal to or exceeds 100 micrometers (0.004 inches).

+++ The RQ for asbestos is limited to friable forms only.

# Indicates that the RQ is subject to change when the assessment of potential carcinogenicity is completed.

The statutory RQ for this hazardous substance may be adjusted in a future rulemaking; until then the statutory RQ applies.

1* Indicates that the 1-pound RQ is a statutory RQ.

** Indicates that no RQ is being assigned to the generic or broad class.

(1+) Indicates that the statutory source for designation of this hazardous substance under CERCLA is CWA section 311(b)(4).

(2+) Indicates that the statutory source for designation of this hazardous substance under CERCLA is CWA section 30711(a)(4).

(3+) Indicates that the statutory source for designation of this hazardous substance under CERCLA is CAA section 112.

(4+) Indicates that the statutory source for designation of this hazardous substance under CERCLA is RCRA section 3001.

AP2. APPENDIX 2

DETERMINATION OF WORST-CASE DISCHARGE PLANNING VOLUME

AP2.1.1. This Appendix provides criteria to determine, on an installation-specific basis, the extent of a worst-case discharge.

AP2.1.2. This Appendix provides criteria to determine the volume of oil or hazardous substance to be used in planning for a worst-case discharge.

AP2.1.2.1. Single Tank Facilities. For facilities containing only one above-ground oil or hazardous substance storage tank, the worst case discharge planning volume equals the capacity of the oil storage tank. If adequate secondary containment (sufficiently large to contain the capacity of the above ground oil or hazardous substance storage tank plus sufficient freeboard to allow for precipitation) exists for the oil storage tank, multiply the capacity of the tank by 0.8.

AP2.1.2.2. Multiple Tank Facilities

AP2.1.2.2.1. Facilities having no secondary containment. If none of the above-ground storage tanks at the facility have adequate secondary containment, the worst-case planning volume equals the total above-ground oil and hazardous substance storage capacity at the facility.

AP2.1.2.2.2. Facilities having complete secondary containment. If every above-ground storage tank at the facility has adequate secondary containment, the worst-case planning volume equals the capacity of the largest single above-ground oil or hazardous substance storage tank.

AP2.1.2.2.3. Facilities having partial secondary containment. If some, but not all above-ground storage tanks at the facility have adequate secondary containment, the worst-case planning volume equals the sum of:

AP2.1.2.2.4. The total capacity of the above-ground oil and hazardous substance storage tanks that lack adequate secondary containment; plus

AP2.1.2.2.5. The capacity of the largest single above-ground oil or hazardous substance storage tank that has adequate secondary containment.

AP2.1.3. For purposes of this Appendix, the term "adequate secondary containment" means an impervious containment system such as a dike, berm, containment curb, drainage system or other device that will prevent the escape of spilled material into the surrounding soil.