

ENVIRONMENTAL FINAL GOVERNING STANDARDS

ITALY

SEPTEMBER 7, 2012

**Revision 2
(June 2015)**



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Ser N00/283
17 Jun 15

From: Commander, Navy Region Europe, Africa, Southwest Asia
To: U.S. Embassy Rome, Italy

Subj: REVISION OF FINAL GOVERNING STANDARDS FOR ITALY

Ref: (a) DoDI 4715.05
(b) DASN (EI&E) memo of 4 Jun 14

Encl: (1) Environmental Final Governing Standards, Italy,
2012 revision 2, Chapters 3 and 6

1. In reference (a), the Under Secretary of Defense, Acquisitions, Technology and Logistics designated the Secretary of the Navy as the Leading Environmental Component (LEC) with the authority and tasking to establish Final Governing Standards (FGS) to protect human health and the environment in certain foreign countries where the military services operate, to include Italy. In reference (b), the Deputy Assistant Secretary of the Navy Energy, Installations and Environment delegated Commander, Navy Region Europe, Africa, Southwest Asia as the LEC in Italy.

2. This letter provides notice to the U.S. diplomatic mission in Italy of the updated FGS for Italy, as required in reference (a) and enclosure (1). All Department of Defense (DoD) Components on DoD installations in Italy are required to comply with the FGS requirements. This FGS update includes Chapter Three: Drinking Water, and Chapter Six: Hazardous Waste. The development of this important document was accomplished in conjunction with DOD components and EUCOM ECJ4-EN throughout.

3. My point of contact is Ms. Kathryn Ostapuk at DSN 314-626-2921, COMM 081-568-2921, or e-mail at kathryn.ostapuk@eu.navy.mil.


J. C. SCORBY, JR.

Copy to:

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Revalidations and Updates <i>IAW DODI 4715.5, paragraph 6.3.6.</i>		
Action	Date	Posted By
Full Revision	September 2012	CNREURAFSWA
Corrected References	September 2013	CNREURAFSWA
Full Revision – Chapters 3 and 6	June 2015	CNREURAFSWA
Administrative Changes – Chapters 1,2,4,5, 7 through 19	June 2015	CNREURAFSWA

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C1. CHAPTER 1OVERVIEWC1.1. PURPOSE

C1.1.1. The primary purpose of these Final Governing Standards (FGS) is to provide environmental compliance criteria at United States (U.S.) Department of Defense (DoD) installations in Italy. This document implements DoD Instruction 4715.05, “Management of Environmental Compliance at Overseas Installations,” dated 22 April 1996, and is based upon DoD 4715.05-G, “Overseas Environmental Baseline Guidance Document” (OEBGD), dated 1 May 2007.

C1.2. APPLICABILITY

C1.2.1. These FGS provide environmental compliance criteria applicable to actions for DoD Components at installations located in Italy.

C1.2.2. These FGS represent minimum criteria; DoD Components may impose additional criteria provided those policies and directives do not directly conflict with these FGS.

C1.2.3. Activities and installations shall notify the DoD Lead Environmental Component (LEC) of any directly conflicting DoD Component policies or directives they discover prior to imposing criteria more protective than provided in these FGS.

C1.2.4. Other than required authorizations for certain activities, DoD Components shall not enter into agreements with Italian authorities at any level that establishes a criterion for compliance with an environmental criterion different than provided in these FGS without the prior written approval of the DoD LEC.

C1.3. EXEMPTIONS

These FGS do not apply to:

C1.3.1. 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.

C1.3.2. Leased, joint use, and similar facilities to the extent that the DoD does not control the instrumentality or operation that a criterion seeks to regulate.

C1.3.3. 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 U.S. 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 (DoDDs) and DoD Instructions (DoDIs), and environmental annexes incorporated into operation plans or operation orders. However, these FGS 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.

C1.3.4. Facilities and activities associated with the Naval Nuclear Propulsion Program, which are covered under Executive Order (E.O.) 12344 “Naval Nuclear Propulsion Program,” and conducted pursuant to 42 United States Code (U.S.C.) 7158.

C1.3.5. The determination or conduct of remediation to correct environmental problems caused by the Department of Defense's past activities, conducted in accordance with DoD Instruction (DoDI) 4715.8, “Environmental Remediation Overseas.”

C1.3.6. Environmental analyses conducted under E.O. 12114, “Environmental Effects Abroad of Major Federal Actions.”

C1.4. DEFINITIONS

For purposes of these FGS, unless otherwise indicated, the following definitions apply:

C1.4.1. Criteria and Management Practices. Particular substantive provisions of the OEBGD that are used by the DoD LEC to develop these FGS.

C1.4.2. Existing Facility. Any facility and/or building, source, or project in use or under construction before 1 October 1994, unless it is subsequently substantially modified.

C1.4.3. Final Governing Standards. A comprehensive set of country-specific substantive provisions, typically technical limitations on effluent, discharges, etc., or a specific management practice.

C1.4.4. Host Nation. Throughout this document the term “host nation” refers to Italy.

C1.4.5. Local National. A DoD employee hired under Italian employment conditions, including local subcontractors’ employees.

C1.4.6. New Facility. Any facility and/or building, source, or project with a construction start date on or after 1 October 1994, or a pre-existing facility that has been substantially modified since 1 October 1994.

C1.4.7. Substantial Modification. Any modification to a facility and/or building the cost of which exceeds \$1 million, regardless of funding source.

C1.5. ADDITIONAL INFORMATION

C1.5.1. The DoD Components shall establish and implement an environmental audit program to ensure that overseas installations assess compliance with these FGS at least once every 3 years at all major installations.

C1.5.2. DoDI 4715.4, “Pollution Prevention,” implements policy, assigns responsibility, and prescribes procedures for implementation of pollution prevention programs throughout the DoD. As a matter of DoD policy, DoDI 4715.4 should be consulted for particular requirements that apply to activities outside the United States. Pollution prevention should be considered in developing the criteria and management practices for these FGS. Where economically advantageous and consistent with mission requirements, pollution prevention shall be the preferred means for attaining compliance with these FGS.

C1.5.3. Laboratory analyses necessary to implement these FGS would 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 certified laboratory, analyses may also be conducted at a laboratory that has an established reliable record of quality assurance compliance with standards for the applicable test method that are generally recognized by appropriate industry or scientific organizations.

C1.5.4. Unless otherwise specified, all record keeping requirements, including assessments, inspection records, logs, manifests, notices, forms, and formats, are described in DoD 8910.1-M, “DoD Procedures for Management of Information Requirements”

C1.5.5. These FGS do 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 these FGS refer to DoDDs and DoDIs, it is intended only to coordinate the requirements of those directives/instructions as required to implement the policies found in DoDI 4715.5. These FGS do not change other DoD or service directives/instructions, or alter DoD or service policies.

C1.5.6. References to websites that are not controlled by the DoD are intended for informational purposes, solely to facility compliance with the existing FGS in this document. Any other requirement, standards or criteria listed in the website shall not be incorporated by references as a Final Governing Standard. Reference to the website does not establish any obligation to comply with other requirements, standards, or criteria listed in the website. Referenced websites that are not under the control of the DoD may be changed at any time without notice to the DoD.

C1.6. WAIVERS

C1.6.1. If compliance with an FGS criteria at a particular installations or facilities would seriously impair operations, adversely affect relations with Italian authorities, or require substantial expenditure of funds at an installation that has been identified for closure or at an installation that has been identified for a realignment that would remove the requirement, a DoD Component may ask the DoD LEC to waive the particular criteria. See DoD Instruction 4715.5,

Management of Environmental Compliance at Overseas Installations, and EUCOM Compliance Instruction (ECI) 4804.01, Environmental Security, for complete waiver procedures.

C1.7. AUTHORIZATIONS AND REPORTING

C1.7.1. The Italian Base Commander (IBC) is the formal representative of the installation and serves as the liaison with host nation authorities. Any formal interaction or interaction of common (U.S. and Italian) interest with Italian authorities should be conducted with the cognizance of the IBC.

C1.7.2. The DoD Components shall not directly obtain authorizations (including, but not limited to licenses and permits) from Italian authorities. If an authorization is required, DoD Components will assist the IBC by providing reports, records or otherwise helping him/her with their liaison duties.

C1.7.3. If the IBC obtains an authorization on behalf of the DoD Component and the authorization requires a more protective criteria than prescribed in the FGS, the criteria in the authorization shall be the compliance criteria. However, if an authorization allows less protective criteria, then the FGS will be the compliance criteria unless a waiver is obtained.

C1.7.4. If the installation at issue does not fall under the responsibility of an IBC, the DoD installation may request clarification from the DoD LEC via the chain of command.

C1.7.5. Contractors performing work for DoD must comply with all Italian laws and regulations including obtaining all necessary licenses, permits, and/or authorizations. Notwithstanding the use of contracts, DoD Components and agencies are required to comply with these FGS unless exempted under Section C1.3., Exemptions.

C1.7.6. Certificates obtained from appropriate Italian authorities (e.g., tank tightness testing) do not fall within the definition of an authorization for which the IBC has responsibility. Request for such services shall be forwarded directly to the appropriate organizations without involving the IBC.

C1.8. ACCESS TO INSTALLATIONS & INFORMATION BY ITALIAN AUTHORITIES

Inspections and non-routine requests for information by Italian authorities shall be coordinated with the IBC and reported to the DoD LEC via the Component chain-of-command. To the maximum extent possible, U.S. military personnel shall lead the review of DoD Component activities by Italian authorities during inspections.

C1.9. LEGAL PROTECTIONS FOR U.S. FORCES EMPLOYEES

C1.9.1. Legal protections afforded DoD personnel investigated or charged by a host nation with alleged offenses arising out of any act or omission done in the performance of official duty vary depending upon the status of the individual under the NATO Status of Forces Agreement

(SOFA) and other applicable international agreements. In general, there is a greater ability for the U.S. to assert a primary right to exercise criminal jurisdiction over a military service member of the force as opposed to a member of the civilian component. There is no such right with respect to local national employees. Accordingly, military service members should assume responsibility under these FGS in lieu of DoD civilians or local national employees where non-compliance may result in a host nation enforcement action.

C1.9.2. Installations, activities, and personnel should immediately contact their servicing legal office when faced with possible or actual host nation enforcement actions in order to maximize protections afforded to DoD personnel under the NATO SOFA, bilateral agreements, and U.S. and DoD regulations, and to secure legal representation for the subjects of the enforcement action (including local national employees). Installations will report possible or actual Italian enforcement actions to the DoD LEC via their chain-of-command.

C1.9.3. If the host nation authorities seek to question a DoD employee regarding his or her official duties, a representative from installation legal should accompany the employee. The installation legal representative should clarify with the host nation authorities whether the employee is questioned as a suspect or a witness, and the employee advised accordingly. It may not be readily apparent whether the host nation legal proceeding is criminal or administrative in nature. This point should be clarified as soon as possible since different procedures may apply depending on the answer. Installations will report interview by Italian authorities to the DoD LEC via their chain-of-command.

C1.10. DoD LEAD ENVIRONMENTAL COMPONENT

C1.10.1. The DoD LEC for these FGS is the Commander, Navy Region Europe Africa Southwest Asia. Any questions or comments pertaining to these FGS shall be sent to:

Commander, Navy Region Europe Africa Southwest Asia
PSC 817 Box 108
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C2. CHAPTER 2

AIR EMISSIONS

C2.1. SCOPE

This Chapter contains minimum standards for air emissions sources. Criteria addressing open burning of solid waste are contained in Chapter 7, “Solid Waste.” Criteria addressing asbestos are contained in Chapter 15, “Asbestos.” The requirements listed within this chapter apply unless more protective requirements are established in a site-specific authorization.

C2.2. DEFINITIONS

C2.2.1. Biodiesel. Vegetable oil or animal fat-based diesel fuel consisting of long-chain alkyl esters. The composition of biodiesel fuels allowed for use in combustion is given in Table 2.5.

C2.2.2. Biogas. Combustible gas derived from the anaerobic and methanogenic fermentation of organic substances different from waste and having the following characteristics:

C2.2.2.1. Composition made mainly of methane and carbon dioxide;

C2.2.2.2. Maximum content of sulfur compounds, expressed as hydrogen sulfide, of 0.1% v/v;

C2.2.2.3. Used in the same industrial complex where it is produced.

C2.2.3. Biomass. Biological material derived from living or recently living organisms. Biomasses allowed for use in combustion include:

C2.2.3.1. Vegetable material derived from dedicated cultivations or from mechanical treatment of non-dedicated cultivations;

C2.2.3.2. Vegetable material derived from forest management operations or pruning;

C2.2.3.3. Vegetable material derived from mechanical treatment of wood or wood residues;

C2.2.3.4. Vegetable material derived from mechanical treatment of agricultural products;

C2.2.3.5. Defatted olive pomace with the following characteristics:

C2.2.3.5.1. Ash $\leq 4\%$ (m/m);

C2.2.3.5.2. Humidity $\leq 15\%$ (m/m);

C2.2.3.5.3. N-hexane ≤ 30 mg/kg (ppm);

C2.2.3.5.4. Calorific value $\geq 15,700$ MJ/kg (6.7×10^6 BTU/lb);

C2.2.3.5.5. Absence of organic chlorinated solvents.

C2.2.4. Cold Cleaning Machine. Any device or piece of equipment that contains and/or uses liquid solvent, into which parts are placed to remove soil 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.

C2.2.5. Commercial and Industrial Solid Waste Incinerator (CISWI) Units. Any combustion device that combusts commercial and industrial waste in an enclosed device using controlled flame combustion without energy recovery that is a distinct operating unit of any commercial or industrial facility (including field-erected, modular, and custom incineration units operating with starved or excess air). CISWI units do NOT include Municipal Waste Combustor Units, Sewage Sludge Incinerators, Medical Waste Incinerators, and Hazardous Waste Combustion Units.

C2.2.6. Emission. Every solid, liquid and gaseous substance introduced in the atmosphere that can cause atmospheric pollution.

C2.2.7. Emulsion Oil. Stable emulsions of water-heating oil, water-kerosene, water-light or medium oil distillate emulsions with the following characteristics:

C2.2.7.1. Water content within the range 10-30%;

C2.2.7.2. Emulsions stabilized by the use of $< 3\%$ of surfactants;

C2.2.7.3. Not containing fluorine compounds, chlorine compounds, and heavy metals.

C2.2.8. 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.

C2.2.9. 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.

C2.2.10. Hydrofluorocarbon (HFC). A compound consisting of hydrogen, fluorine, and carbon often used as a replacement for Ozone-Depleting Substances (ODS).

C2.2.11. 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.

C2.2.12. Licensed Professional. A professional installing thermal civil plants who has been licensed by the Competent Authority.

C2.2.13. Motor Vehicle. Any commercially available vehicle that is not adapted to military use which 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.

C2.2.14. Municipal Waste Combustion (MWC) Units. Any equipment that combusts solid, liquid, or gasified municipal solid waste (MSW) including, but not limited to, field-erected MWC units (with or without heat recovery), modular MWC units (starved-air or excess-air), boilers (for example, steam generating units), furnaces (whether suspension-fired, grate-fired, mass-fired, air curtain incinerators, or fluidized bed-fired), and pyrolysis/combustion units. Municipal waste combustion units do NOT include pyrolysis or MWC units located at a plastics or rubber recycling unit, cement kilns that combust MSW, internal combustion engines, gas turbines, or other combustion devices that combust landfill gases collected by landfill gas collection systems.

C2.2.15. Municipal Solid Waste (MSW). Any household, commercial/retail, or institutional waste. Household waste includes material discarded from residential dwellings, hotels, motels, and other similar permanent or temporary housing. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, nonmanufacturing activities at industrial facilities, and other similar establishments or facilities. Institutional waste includes materials discarded by schools, hospitals (nonmedical), nonmanufacturing activities at prisons and government facilities, and other similar establishments or facilities. Household, commercial/retail, and institutional waste does include yard waste and refuse-derived fuel. Household, commercial/retail, and institutional waste does not include used oil; sewage sludge; wood pallets; construction, renovation, and demolition wastes (which include railroad ties and telephone poles); clean wood; industrial process or manufacturing wastes; medical waste; or motor vehicles (including motor vehicle parts or vehicle fluff).

C2.2.16. Ozone-Depleting Substances (ODS). Those substances listed in Table 2.2.

C2.2.17. Particulate Matter (PM). Total suspended particulates with a size from 0.001 μm to 500 μm , determined considering a content of O_2 within the anhydrous gas emission equal to 3% in volume for liquid and gaseous fuels and to 6% in volume for solid fuels and referred to the volume of dry gaseous emissions reported to normal conditions 0°C (32°F) and 0.1013 Mpa (14.7 pounds per square inch (psi)).

C2.2.18. 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).

C2.2.19. Perfluorocarbon (PFC). A compound consisting solely of carbon and fluorine often used as a replacement for ODS.

C2.2.20. 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.

C2.2.21. Pyrolysis. The endothermic gasification of hospital waste and/or medical/infectious waste using external energy.

C2.2.22. Recycling. The reuse of ODS after a cleaning process based on filtration and drying. For refrigerants, recycling includes the recharge of equipment carried out on site.

C2.2.23. Stack. Any point in a source covered by criteria contained in C2.3.1., C2.3.2., C2.3.3., C2.3.4., or C2.3.5. designed to emit pollutants.

C2.2.24. Steam/Hot Water 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.

C2.2.25. Substantially Modified. Any modification to a facility/building, the cost of which exceeds \$1 million, regardless of funding source.

C2.2.26. Thermal Civil Plant. Any unit or group of interconnected units designated to heat living areas, also in non-residential buildings, and produce hot water for civil and sanitary uses. For the purposes of this Chapter, thermal civil plants are units with a capacity > 35 kW (119,000 BTU/hr) and lower than:

C2.2.26.1. 1 MW (3.4 million BTU/hr) if fueled with biomass, oil, emulsion oil and/or biodiesel;

C2.2.26.2. 0.3 MW (1 million BTU/hr) if fueled with fuel oil or emulsion oil;

C2.2.26.3. 3 MW (10.2 million BTU/hr) if fueled with natural gas and LPG; or

C2.2.26.4. 3 MW (10.2 million BTU/hr) if fueled with biogas.

C2.2.27. Vapor Cleaning Machine. A batch or in-line solvent cleaning machine that boils liquid solvent which generates solvent vapor that is used as a part of the cleaning or drying cycle.

C2.2.28. 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. The following standards apply to units that commenced construction on or after 1 October 1994 or that were substantially modified since 1 October 1994.

C2.3.1.1. DoD installations operating thermal civil plants will obtain a declaration prepared and signed by the licensed professional who installed the thermal civil plants describing the technical characteristics of the plant. Installations will provide the declaration upon request to the Italian Base Commander.

C2.3.1.2. Air Emission Standards. The following criteria apply to units with a maximum design heat input, including thermal civil plants.

C2.3.1.2.1. 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 2.1 at all times, except during periods of start up, shut down, soot blowing, malfunction, or when emergency conditions exist.

C2.3.1.2.2. Thermal civil plants shall comply with the emission limit for particulate matter (PM) of 50 mg/Nm³, except during periods of start up, shut down, soot blowing, and malfunction. Installations shall verify annually compliance with this limit. Records shall be maintained and provided to the Italian Base Commander upon request. Verification is not required for boilers fed by LNG, natural gas, LPG, light and medium oils meeting the requirements of Table 2.4, and by emulsions with the following characteristics:

C2.3.1.2.2.1. Stable emulsions water-heating oil, water-kerosene, water-light and medium oil distillates;

C2.3.1.2.2.2. Water content within the range 10-30%;

C2.3.1.2.2.3. Emulsions stabilized by the use of < 3% of surfactants;

C2.3.1.2.2.4. Not containing fluorine compounds, chlorine compounds, and heavy metals.

C2.3.1.2.3. The composition of liquid fuels allowed for use in combustion is given in Table 2.4, whereas characteristics of allowed biodiesel are reported in Table 2.5. The use of lignite, steam coal, metallurgic coke and gas coke, and anthracite is prohibited in thermal civil units.

C2.3.1.2.4. For units combusting liquid or solid fossil fuels, fuel sulfur content (weight %) and higher heating value will be measured and recorded for each new shipment of fuel. Use these data to calculate sulfur dioxide (SO₂) emissions and document compliance with the SO₂ limits using the equation in Table 2.1. Alternatively, install a properly calibrated and maintained continuous emissions monitoring system to measure the flue gas for SO₂ and either oxygen (O₂) or carbon dioxide (CO₂).

C2.3.1.2.5. Installations that possess an authorization to emit greenhouse gas shall monitor emissions. Installations that do not exceed the 3MW power ceiling, or whose aggregate power (i.e., several boilers) results in <20MW, are excluded from this requirement.

C2.3.1.3. Air Emissions Monitoring. All civil thermal plants with a thermal capacity > 1.5 MW (approx. 5.1 million BTU/hr) shall have a temperature monitoring device and a continuous oxygen and carbon monoxide monitoring device.

C2.3.1.3.1. For units with a maximum design heat input capacity > 8.8 MW (approx. 30 million BTU/hr): Opacity, except that continuous emissions monitoring system (CEMS) is not required where gaseous or distillate fuels are the only fuels combusted.

C2.3.1.3.2. For fossil fuel fired units with a maximum design heat input capacity > 29 MW (approx. 100 million BTU/hr): NO_x and either O₂ or CO₂.

C2.3.2. Incinerators. Operation of on-site incinerators requires an authorization (see Chapter 1 for the process). The following requirements do not apply to incinerators combusting

hazardous waste or munitions. Refer to Chapter 6, “Hazardous Waste,” for information regarding hazardous waste disposal and incineration.

C2.3.2.1. Incinerators shall comply with air emission limits as established in Table 2.3-a and Table 2.3-b. All incinerators shall be designed, constructed, equipped and managed as follows:

C2.3.2.1.1. Infectious sanitary waste shall be introduced directly into the incinerator without being mixed with other waste categories.

C2.3.2.1.2. Unit design: each incineration line has to be equipped with an auxiliary burner that is used during start up and shut down to raise and maintain operating temperature until waste is placed in the combustion chamber. Minimum residence time for waste in the combustion chamber is two seconds. The burner is not to be fed with fuels that can result in higher emissions than those generated by diesel oil, liquefied gas or natural gas. The burner shall automatically maintain the following combustion gas temperatures:

C2.3.2.1.2.1. Minimum temperature in the combustion chamber: after the last air inflow, combustion gases shall reach and maintain a homogeneous temperature of $\geq 850^{\circ}\text{C}$ ($1,562^{\circ}\text{F}$).

C2.3.2.1.2.2. Minimum temperature in the combustion chamber in the event that wastes contain $> 1\%$ of halogenated compounds (as Cl): $1,100^{\circ}\text{C}$ ($2,012^{\circ}\text{F}$).

C2.3.2.2. Medical Waste Incinerators (MWI). The following standards apply to all 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. Refer to Chapter 8, “Medical Waste,” for other requirements pertaining to medical waste management.

C2.3.2.2.1. All MWI must be designed and operated according to the following good combustion practices (GCP):

C2.3.2.2.1.1. Unit design: dual chamber.

C2.3.2.2.1.2. Minimum temperature in primary chamber: $760\text{--}870^{\circ}\text{C}$ ($1400\text{--}1600^{\circ}\text{F}$).

C2.3.2.2.1.3. Minimum temperature in secondary chamber: $982\text{--}1204^{\circ}\text{C}$ ($1800\text{--}2200^{\circ}\text{F}$).

C2.3.2.2.1.4. Minimum residence time in the secondary chamber: 2 seconds.

C2.3.2.2.1.5. Incinerator operators must be trained in accordance with applicable Service requirements.

C2.3.3. Perchloroethylene (PCE) Dry Cleaning Machines. The following requirements apply to all dry cleaning machines. These requirements do not apply to coin-operated machines.

C2.3.3.1. Emissions from PCE dry cleaning machines installed before 1 October 1994 that use > 7,570 liters (2,000 gallons) per year of PCE (installation wide) in dry cleaning operations must be controlled with a refrigerated condenser, unless a carbon absorber was already installed. The temperature of the refrigerated condenser must be maintained at $\leq 7.2^{\circ}\text{C}$ (45°F). Dry cleaning machines and control devices must be operated according to manufacturer recommendations.

C2.3.3.2. All PCE dry cleaning systems installed on or after 1 October 1994 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 $\leq 7.2^{\circ}\text{C}$ (45°F). Dry cleaning machines and control devices must be operated according to manufacturer recommendations.

C2.3.4. Chromium Electroplating and Chromium Anodizing Tanks. Electroplating and anodizing tanks must comply with one of the three methods below for controlling chromium emissions. Implement one of the following methods that is most appropriate to suit local conditions:

C2.3.4.1. Option 1: Limit chromium emissions in the ventilation exhaust to 0.015 milligrams per dry standard meter³ (mg/dscm). Control devices/methods must be operated according to manufacturer recommendations.

C2.3.4.2. Option 2: Use chemical tank additives to prevent surface tension of the electroplating or anodizing bath from exceeding 45 dynes per centimeter (cm) as measured by a stalagmometer or 35 dynes/cm as measured by a tensiometer. Measure the surface tension prior to the first initiation of electric current on a given day and every 4 hours thereafter.

C2.3.4.3. Option 3: Limit chromium emissions to the maximum allowable mass emission rate (MAMER) calculated using the following equation: $\text{MAMER} = \text{ETSA} \times \text{K} \times 0.015$ mg/dscm, where: MAMER = the alternative emission rate for enclosed hard chromium electroplating tanks in mg/hr; ETSA = the hard chromium electroplating tank surface area in feet² (ft²); K = a conversion factor, 425 dscm/(ft²-hr). Option 3 is ONLY applicable to hard chrome electroplating tanks equipped with an enclosing hood and ventilated at half the rate or less than that of an open surface tank of the same surface area.

C2.3.5. Halogenated Solvent Cleaning Machines. These requirements apply to all solvent cleaning machines that use solvent which contains > 5% 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.

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-inch (2.54-cm) water layer or a freeboard ratio of ≥ 0.75 .

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

C2.3.6. Units Containing ODS Listed in Table 2.2. The following criteria apply to direct atmospheric emissions of ODS, HFCs, and perfluorocarbons (PFC) from refrigeration equipment and ODS from fire suppression equipment listed in Table 2.2.

C2.3.6.1. Except as allowed in C2.3.6.2 and C2.3.6.3, use (i.e., utilization in maintenance or servicing of any products and equipment) or critical uses of ODS, as listed in Table 2.2, is prohibited. Running an existing system without maintenance (e.g., using a refrigerator) would not be classified as use.

C2.3.6.2. Halons may only be used for critical uses as specified in Table 2.6.

C2.3.6.3. The use of ODS may be allowed:

C2.3.6.3.1. In essential laboratory and analytical use.

C2.3.6.3.2. As feedstock (i.e., undergoes chemical transformation in a process in which it is entirely converted from its original composition and its emissions are insignificant).

C2.3.6.3.3. As process agents (i.e. used as chemical process agents in the applications allowed under recognized industry standards).

C2.3.6.3.4. As halon substitutes in existing fire protection systems specified in Table 2.6 under the following conditions:

C2.3.6.3.4.1. Original halons contained in such fire protection systems shall be replaced completely;

C2.3.6.3.4.2. Halons withdrawn shall be destroyed in accordance with Table 2.7.

C2.3.6.4. The use of virgin HCFCs in the maintenance and servicing of refrigeration and air-conditioning equipment shall be prohibited from 1 January 2010, in equipment existing at that time. The use of all HCFCs in the maintenance and servicing of all refrigeration and air-conditioning equipment shall be prohibited from 1 January 2015.

C2.3.6.5. Recovery Requirements for ODS. ODS identified in Table 2.2. shall be recovered as follows using equipment operated by trained personnel:

C2.3.6.5.1. ODS contained in commercial and industrial refrigeration/air-conditioning equipment, equipment containing solvents, fire protection systems, and fire extinguishers shall be recovered for disposal in accordance with DoD 4160.21-M, Defense Materiel Disposition Manual, Chapter 10.

C2.3.6.5.2. ODS contained in domestic refrigerators and freezers shall be recovered per DoD 4160.21-M, Defense Materiel Disposition Manual, Chapter 10.

C2.3.6.5.3. ODS contained in products, installations, and equipment other than those mentioned above shall be recovered, if practicable, per DoD 4160.21-M, Defense Materiel Disposition Manual, Chapter 10.

C2.3.6.5.4. ODS recovered for destruction may only be subject to destruction technologies listed in Table 2.7.

C2.3.6.6. Refrigerant Venting Prohibition. Any class I or class II ODS, HFC, and PFC refrigerant shall not be intentionally released 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, HFC, and PFC refrigerants are not subject to this prohibition.

C2.3.6.7. Refrigerant Leak Monitoring and Repair. Monitor and repair refrigeration equipment for ODS leakage in accordance with the following criteria and repair, if found to be leaking.

C2.3.6.7.1. Equipment containing a quantity of ODS > 3 kg (6.6 lbs) shall be monitored for leaks as follows:

C2.3.6.7.1.1. Yearly, for equipment with an ODS quantity of 3 to 30 kg (6.6 lbs to 66 lbs);

C2.3.6.7.1.2. Every six months for equipment with an ODS quantity 30 kg (66 lbs to 660 lbs) to 300 kg;

C2.3.6.7.1.3. Every three months > 300 kg (660 lbs).

C2.3.6.7.2. Monitoring shall be conducted using a leak detector with a sensitivity > 5g/year. The monitoring shall be conducted both on the high pressure side with the equipment operating, and on the low pressure side with the equipment turned off.

C2.3.6.7.3. Any detected leak shall be repaired as soon as possible and in any event within 14 days. The equipment or system shall be checked for leakage within 1 month after a leak has been repaired to ensure that the repair has been effective. The equipment or system can be turned on only after the repair.

C2.3.6.8. Halons shall not be intentionally released 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:

C2.3.6.8.1. *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).

C2.3.6.8.2. Emergency releases for the legitimate purpose of fire extinguishing, explosion inertion, or other emergency applications for which the equipment or systems were designed.

C2.3.6.8.3. 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. These criteria apply to DoD-owned motor vehicles as defined in the definitions section (C2.2.13.).

C2.3.7.1. All vehicles shall be inspected every two years to ensure that no tampering with factory-installed emission control equipment has occurred. CO emissions for gasoline vehicles manufactured according to European specifications after 1986 will not exceed 3.5% in volume. For gasoline vehicles manufactured in Europe prior to 1986, the CO emission will not exceed 4.5% in volume. Motor vehicles manufactured according to European specifications and equipped with diesel engines will not exceed a 50% opacity (45% for buses).

C2.3.7.2. Use only unleaded gasoline (with a maximum lead content of 0.013 g/L) in vehicles that are designed for this fuel. The maximum lead content for lead-bearing gasoline is 0.15 g/L.

C2.3.8. Stack Heights. H_g is the good engineering practice stack height necessary to minimize downwash of stack emissions due to aerodynamic influences from nearby structures.

C2.3.8.1. Stacks shall be designed and constructed to heights at least equal to the largest H_g calculated from either of the following two criteria:

C2.3.8.1.1. $H_g = H + 1.5L$, where H is the height of the nearby structure measured from the ground level elevation at the base of the stack, and L is the lesser of height or projected width of the nearby structure(s). A structure is determined to be nearby when the stack is located within $5L$ of the structure envelope but not > 0.8 km (0.5 mile). This calculation shall be performed for each structure nearby the stack being studied to determine the greatest H_g .

C2.3.8.1.2. H_g is the height demonstrated by a fluid model or a field study, which ensures that the emissions from a stack do not result in maximum ground-level concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures, or nearby terrain features $\geq 40\%$ in excess of the maximum ground-level concentrations of any air pollutant experienced in the absence of such atmospheric downwash, wakes, or eddy effects. For purposes of this paragraph, "nearby" means not > 0.8 km (0.5 mile), except that the portion of a terrain feature may be considered to be nearby, which falls within a distance of up to 10 times the maximum height (H_t) of the feature, not to exceed 3.2 kilometers (2 miles) if such feature achieves a height (H_t) 0.8 km from the stack that is $\geq 40\%$ of the good engineering practice stack height determined by the formulae provided in C2.3.8.1.1. of this part or 26 meters (85.3 feet), whichever is greater, as measured from the ground-level elevation at the base of the stack. The height of the structure or terrain feature is measured from the ground-level elevation at the base of the stack.

Table 2.1. Emission Standards for 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

Notes:

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% standard applies to the average opacity over a 6-minute period. A 30% opacity value is allowed for one 6-minute period per hour.

^c. SO₂ is best controlled and compliance documented by limiting fuel sulfur content.

SO₂ 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% sulfur, SO₂ = 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 ≥ 25% 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 SO₂, fuel oil combustion units may comply with a 0.5% average fuel sulfur content limit (weight %) which is statistically equivalent to 0.5 lb/million BTU.

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

Table 2.2. 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		Carbon Tetrachloride
CFC - 112	CFC - 213		Methyl Chloroform
CFC - 113	CFC - 214		Methyl Bromide
CH ₂ FBr ₂	C ₂ H ₂ F ₃ Br	C ₃ HF ₆ Br	C ₃ H ₃ F ₄ Br
HBFC-2201 (CH ₂ F ₂ Br)	C ₂ H ₃ FBr ₂	C ₃ H ₂ FBr ₅	C ₃ H ₄ FBr ₃
CH ₂ FBr	C ₂ H ₃ F ₂ Br	C ₃ H ₂ F ₂ Br ₄	C ₃ H ₄ F ₂ Br ₂
C ₂ HFBr ₄	C ₂ H ₄ FBr	C ₃ H ₂ F ₃ Br ₃	C ₃ H ₄ F ₃ Br
C ₂ HF ₂ Br ₃	C ₃ HFBr ₆	C ₃ H ₂ F ₄ Br ₂	C ₃ H ₅ FBr ₂
C ₂ HF ₃ Br ₂	C ₃ HF ₂ Br ₅	C ₃ H ₂ F ₅ Br	C ₃ H ₅ F ₂ Br
C ₂ HF ₄ Br	C ₃ HF ₃ Br ₄	C ₃ H ₃ FBr ₄	C ₃ H ₆ FBr
C ₂ H ₂ FBr ₃	C ₃ HF ₄ Br ₃	C ₃ H ₃ F ₂ Br ₃	Chlorobromomethane
C ₂ H ₂ F ₂ Br ₂	C ₃ HF ₅ Br ₂	C ₃ H ₃ F ₃ Br ₂	
Class II			
HCFC – 21	HCFC – 133a	HCFC – 225cb	HCFC – 243
HCFC – 22	HCFC – 141b	HCFC – 226	HCFC – 244
HCFC – 31	HCFC – 142b	HCFC – 231	HCFC – 251
HCFC – 121	HCFC – 151	HCFC – 232	HCFC – 252
HCFC – 122	HCFC – 221	HCFC - 233	HCFC – 253
HCFC – 123	HCFC – 222	HCFC – 234	HCFC – 261
HCFC – 124	HCFC – 223	HCFC – 235	HCFC – 262
HCFC – 131	HCFC – 224	HCFC – 241	HCFC – 271
HCFC – 132b	HCFC – 225ca	HCFC – 242	

Note:

All isomers of the above chemicals are ODS, except isomers of (1,1,1-trichloroethane (also known as methyl chloroform)) such as 1,1,2-trichloroethane.

Table 2.3-a. Emission Standards for Incinerators (daily averages)

Pollutant Daily Average Values					
Particulate Matter			10 mg/m ³		
Gaseous and vapor organic compounds (as TOC)			10 mg/m ³		
Gaseous and vapor chlorine inorganic compounds (as HCl)			10 mg/m ³		
Gaseous and vapor fluorine inorganic compounds (as HF)			1 mg/m ³		
Sulfur dioxides (as SO ₂)			50 mg/m ³		
Nitrogen dioxide (as NO ₂) ^{1,2}			200 mg/m ³		
If not established otherwise in the air emission authorization:					
Emission Standards Concentrations ³					
	Existing MWC units ⁴		MWC units that begin new construction or undergo substantial modification ⁴		CISWI
	32-250 tpd	>250 tpd	32-250 tpd	>250 tpd	All units
Opacity	10%		10%		10%
Dioxins/furans	125 ng/dscm	See Note ⁵	13 ng/dscm	125 ng/dscm	0.41 ng/dscm
Cadmium	0.10 mg/dscm	0.040 mg/dscm	0.020 mg/dscm	0.10 mg/dscm	0.004 mg/dscm
Lead	1.6 mg/dscm	0.44 mg/dscm	0.20 mg/dscm	1.6 mg/dscm	0.04 mg/dscm
Mercury	85% reduction or 0.080 mg/dscm		85% reduction or 0.080 mg/dscm		0.47 mg/dscm
Fugitive ash	5% of hourly observation period		5% of hourly observation period		N/A

Notes:

1. A waiver can be obtained for NO_x for urban waste incinerators already existing on 14 February 1998 provided that the daily average is lower than 20 mg/m³.
2. A waiver can be obtained for NO_x until 1 January 2010 for urban waste incinerators with nominal capacity > 6 t/h and lower than 16 t/h already existing on 14 February 1998, provided that the daily average is lower than 400 mg/m³.
3. Emission standard concentrations (mg/dscm, ppmv) are corrected to 7% oxygen, dry basis at standard conditions. mg/dscm = milligram per dry standard meter³, ng = nanogram, ppm = parts per million.
4. Construction or modifications that were undertaken pursuant to existing (or previous) FGS are not subject to these requirements. These criteria are not intended to require retrofitting of MWC units.
5. Dioxins/furans limits for units rated >250 tpd capacity: MWC with electrostatic precipitator (ESP)-60 ng/dscm; MWC with non-ESP-30 ng/dscm.

Table 2.3-b. Emission Standards for Incinerators (30-minutes average)

Pollutant 30-minute Average Values [mg/m³]		
	100% (A)	97% (B)
Total particulates	30	10
Gaseous and vapor organic compounds (as TOC)	20	10
Gaseous and vapor chlorine inorganic compounds (as HCl)	60	10
Gaseous and vapor fluorine inorganic compounds (as HF)	4	2
Sulfur dioxides (as SO ₂)	200	50
Nitrogen dioxide (as NO ₂) ¹	400	200

Notes:

1. A waiver can be obtained for NO_x until 1 January 2010 for urban waste incinerators with nominal capacity lower than 16 t/h already existing on 14 February 1998, provided that the 30-minutes average value is lower than 600 mg/m³ for column A (100%) or 400 mg/m³ for column B (97%).

Table 2.4. Liquid Fuels

Characteristics	Unit	Heating oil/kerosene/ light and medium oil distillates	Fuel oil and other heavy oil distillates										Recommended Analytical Method or equivalent
			Very fluid BTZ		Fluid BTZ		Semi-fluid BTZ		Thick ATZ		Thick BTZ		
			1	2	3	4	5	6	7	8	9	10	
Viscosity													
At 50° C	mm ² /s		<21.2		From 21.2 to 37.4		From 37.5 to 91.0		>91		>91		EN ISO 3104
At 50° C	° E		<3		From 3.0 to 5.0		From 5.1 to 12.0		>12		>12		EN ISO 3104
At 40° C	mm ² /s	From 2.0 to 7.4 ¹											EN ISO 3104
Water & deposits	% (V/V)	≤0.05	≤0.05		≤1.0		≤1.0						UNI 20058
Water	% (V/V)								≤1.5		≤1.5		ISO 3733
Deposits	% (V/V)								≤0.5		≤0.5		ISO 3735
Sulfur ²	% (m/m)	≤0.2	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3	≤1.0	≤0.3	≤4.0	≤0.3	≤1.0	UNI EN ISO 8754
Carbon residue	% (m/m)		≤6	≤15	≤6	≤15	≤6	≤15	≤18		≤6	≤15	ISO 6615
Nickel + Vanadium	mg/kg	≤15	≤50	≤180	≤50	≤180	≤50	≤180	≤230		≤50	≤180	UNI E 09.10.024.0 EN 13131
Ash	% (m/m)		≤0.05		≤0.10		≤0.15		≤0.20		≤0.20		UNI EN ISO 6245
PCB/PCT	mg/kg	Non detectable	Non detectable		Non detectable		Non detectable		Non detectable		Non detectable		DIN 51527 EN 12766

Notes:

See section C1.5.3 for laboratory requirements.

ATZ = High sulfur content fuel (up to 3%)

BTZ = Low sulfur content fuel (up to 1%)

1. Only for gas oil.

2. Liquid fuels and emulsions with sulfur content ≥0.3% are not allowed for thermal plants having a capacity lower than 3 MW (10.2 million BTU/hr). Where the sum of Nickel and Vanadium is > 180 mg/kg, fuel oils with sulfur content ≥3% are not allowed for thermal plants having a capacity > 50 MW (170.6 million BTU/hr).

Table 2.5. Biodiesel

Characteristics	Unit	Recommended Analytical method or equivalent	Limits	
			Min	Max
Viscosity at 40 °C	mm ² /s	EN ISO 3104 ISO 3105	3.5	5.0
Carbon residue (10% distillation residue)	% (m/m)	EN ISO 10370	-	0.3
Sulfated ash	% (m/m)	ISO 3987	-	0.02
Water	mg/kg	EN ISO 12937:2000	-	500
Total contamination	mg/kg	EN 12662	-	24
Acid value	mg KOH/g	EN 14104		0.50
Ester content	% (m/m)	EN 14103	96.5	
Monoglyceride content	% (m/m)	EN 14105		0.80
Diglyceride content	% (m/m)	EN 14105		0.20
Triglyceride content	% (m/m)	EN 14105		0.20
Free glycerol	% (m/m)	EN 14105 EN 14106		0.02
CFPP (cold filter plugging point)	°C	UNI EN 116		
Pour point	°C	ISO 3016		0
Calorific value	MJ/kg	DIN 51900:1989 DIN 51900-1:1998 DIN 51900-2:1997 DIN 51900-3:1977	35	
Iodine value	g Iodine/100 g	EN 14111		130
Sulfur	mg/kg	prEN ISO 20846 prEN ISO 20884		10.0
Oxidation stability 110 °C	hours	EN 14112	4.0	

Notes:

See section C1.5.3. for laboratory requirements.

Table 2.6. Critical Uses of Halon

Application				Cut-off date¹ (31 December of the stated year)	End date² (31 December of the stated year)
Category of equipment or facility	Purpose	Type of extinguisher	Type of Halon		
On military ground vehicles	For the protection of engine compartments	Fixed system	1301 1211 2402	2010	2035
	For the protection of crew compartments	Fixed system	1301 2402	2011	2040
		Portable extinguisher	1301 1211	2011	2020
On ship military surface ships	For the protection of normally occupied machinery spaces	Fixed system	1301 2402	2010	2040
	For the protection of normally unoccupied engine spaces	Fixed system	1301 1211 2402	2010	2035
	For the protection of normally unoccupied electrical compartments	Fixed system	1301 1211	2010	2030
	For the protection of command centers	Fixed system	1301	2010	2030
	For the protection of fuel pump rooms	Fixed system	1301	2010	2030
	For the protection of flammable liquid storage compartments	Fixed system	1301 1211 2402	2010	2030
	For the protection of aircraft in hangars and maintenance areas	Portable extinguisher	1301 1211	2010	2016
On military submarines	For the protection of machinery spaces	Fixed system	1301	2010	2040
	For the protection of command centers	Fixed system	1301	2010	2040
	For the protection of diesel generator spaces	Fixed system	1301	2010	2040
	For the protection of electrical	Fixed system	1301	2010	2040

Application				Cut-off date¹ (31 December of the stated year)	End date² (31 December of the stated year)
Category of equipment or facility	Purpose	Type of extinguisher	Type of Halon		
	compartments				
On aircraft	For the protection of normally unoccupied cargo compartments	Fixed system	1301 1211 2402	2018	2040
	For the protection of cabins and crew compartments	Portable extinguisher	1211 2402	2014	2025
	For the protection of engine nacelles and auxiliary power units	Fixed system	1301 1211 2402	2014	2040
	For the inerting of fuel tanks	Fixed system	1301 2402	2011	2040
	For the protection of lavatory waste receptacles	Fixed system	1301 1211 2402	2011	2020
	For the protection of dry bays	Fixed system	1301 1211 2402	2011	2040
In oil, gas and petrochemicals facilities	For the protection of spaces where flammable liquid or gas could be released	Fixed system	1301 2402	2010	2020
On commercial cargo ships	For the inerting of normally occupied spaces where flammable liquid or gas could be released	Fixed system	1301 2402	1994	2016
In land-based command and communications facilities essential to national security	For the protection of normally occupied spaces	Fixed system	1301 2402	2010	2025
		Portable extinguisher	1211	2010	2013
	For the protection of normally unoccupied spaces	Fixed system	1301 2402	2010	2020

Application				Cut-off date¹ (31 December of the stated year)	End date² (31 December of the stated year)
Category of equipment or facility	Purpose	Type of extinguisher	Type of Halon		
At airfields and airports	For crash rescue vehicles	Portable extinguisher	1211	2010	2016
	For the protection of aircraft in hangars and maintenance areas	Portable extinguisher	1211	2010	2016
In nuclear power and nuclear research facilities	For the protection of spaces where necessary to minimize risk of dispersion of radioactive matter	Fixed system	1301	2010	2020
In the Channel Tunnel	For the protection of technical facilities	Fixed system	1301	2010	2016
	For the protection of power cars and shuttle wagons of Channel Tunnel trains	Fixed system	1301	2010	2020
Other	For the initial extinguishing by fire brigades where essential to personal safety	Portable extinguisher	1211	2010	2013
	For the protection of persons by military and police personnel	Portable extinguisher	1211	2010	2013

1. Cut-off Date - The date after which halons must not be used for fire extinguishers or fire protection systems in new equipment and new facilities for the application concerned.

2. End Date - The date after which halons shall not be used for the application concerned and by which date the fire extinguishers or fire protection systems containing halons shall be decommissioned.

Table 2.7. Destruction Technologies of Used ODS

Technology	Controlled Substances ^{1, 2}		Dilute Sources ³
	CFC, carbon tetrachloride, 1,1,1-trichloroethane, HCFC	Halons	Foam
Destruction and removal efficiency (DRE)	99.99 %	99.99 %	95 %
Cement kilns	Approved	Not applicable	Not applicable
Liquid injection incineration	Approved	Approved	Not applicable
Gaseous/fume oxidation	Approved	Approved	Not applicable
Municipal solid waste incineration	Not applicable	Not applicable	Approved
Reactor cracking	Approved	Not applicable	Not applicable
Rotary kiln incineration	Approved	Approved	Approved
Argon plasma arc	Approved	Approved	Not applicable
Inductively coupled radio frequency plasma	Approved	Approved	Not applicable
Microwave plasma	Approved	Not applicable	Not applicable
Nitrogen plasma arc	Approved	Not applicable	Not applicable
Gas phase catalytic dehalogenation	Approved	Not applicable	Not applicable
Superheated steam reactor	Approved	Not applicable	Not applicable

Notes:

1. Controlled substances not listed below shall be destroyed by the most environmentally acceptable destruction technology not entailing excessive costs.
2. Concentrated sources refer to virgin, recovered and reclaimed ozone-depleting substances.
3. Dilute sources refer to ozone-depleting substances contained in a matrix of a solid, for example foam.

C3. CHAPTER 3DRINKING WATERC3.1. SCOPE

This Chapter contains standards 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 DoD Component commander to be responsible for resolving medical issues necessary to provide safe drinking water at the Component's installations.

C3.2.3. Audit Monitoring. Relatively less frequent monitoring (compared to Check Monitoring) carried out to assess compliance with all relevant drinking water standards (except radioactive parameters).

C3.2.4. Check Monitoring. Relatively frequent monitoring (compared to Audit Monitoring) carried out to assess whether applicable standards are being met.

C3.2.5. 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 3.11 through 3.24.

C3.2.6. Conventional Treatment. Water treatment, including chemical coagulation, flocculation, sedimentation, and filtration.

C3.2.7. 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.

C3.2.8. Direct Filtration. Water treatment including chemical coagulation, possibly flocculation, and filtration, but not sedimentation.

C3.2.9. Disinfectant. Any oxidant (including, but not limited to, chlorine, chlorine dioxide, chloramines, and ozone) intended to kill or inactivate pathogenic microorganisms in water.

C3.2.10. DoD Water System. A public or non-public water system.

C3.2.11. First Draw Sample. A 1-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. Haloacetic Acids. The sum of the concentrations in milligrams per liter of the haloacetic acid compounds (monochloroacetic acid, dichloroacetic acid, trichloroacetic acid, monobromoacetic acid, and dibromoacetic acid), rounded to two significant figures after addition.

C3.2.14. Lead-Free. A maximum lead content of 0.2% for solder and flux, and 8.0% for pipes and fittings.

C3.2.15. 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.

C3.2.16. 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.

C3.2.17. Maximum Residual Disinfectant Level (MRDL). The level of a disinfectant added for water treatment measured at the consumer's tap, which may not be exceeded without the unacceptable possibility of adverse health effects.

C3.2.18. 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 fewer than 25 people).

C3.2.19. 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.

C3.2.20. Point-of-Use (POU) Treatment Device. A treatment device applied to a tap to reduce contaminants in drinking water at that tap.

C3.2.21. 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. It includes water used for drinking, cooking, food preparation, and other domestic uses, regardless of its origin or the manner in which it is distributed to the consumer.

C3.2.22. 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 a daily average of at least 25 individuals at least 60 days of the year. This also includes 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 PWS is either a "community water system" or a "non-community system":

C3.2.22.1. Community Water System (CWS). A PWS that has at least 15 service connections used by year-round residents, or which regularly serves at least 25 year-round residents.

C3.2.22.2. Non-Community Water System (NCWS). A PWS that serves the public, but does not serve the same people year-round.

C3.2.22.2.1. Non-transient, Non-community Water System (NTNCWS). A PWS that supplies water to at least 25 of the same people at least six months per year, but not year-round. Examples include schools, factories, office buildings, and hospitals that have their own water systems.

C3.2.22.2.2. Transient, Non-Community Water System (TNCWS). A PWS that provides water to at least 25 persons (but not the same 25 persons) at least six months per year. Examples include but are not limited to gas stations, motels, and campgrounds that have their own water sources.

C3.2.23. 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.

C3.2.24. Slow Sand Filtration. Water treatment process where raw water passes through a bed of sand at a low velocity 0.365 m/hr (1.2 ft/hr), resulting in particulate removal by physical and biological mechanisms.

C3.2.25. Total Trihalomethanes. The sum of the concentration in milligrams per liter of chloroform, bromoform, dibromochloromethane, and bromodichloromethane.

C3.2.26. 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 the principle function of the well is the emplacement of any fluid.

C3.2.27. Vulnerability Assessment. The process the commander uses to determine the susceptibility to attack from the full range of threats to the security of personnel, family members, and facilities, which provide a basis for determining antiterrorism measures that can protect personnel and assets from terrorist attacks.

C3.2.28. Water Intended for Human Consumption. All water either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic uses regardless of its origin or supply mechanism.

C3.3. CRITERIA

C3.3.1. Authorization Requirements. DoD installations intending to withdraw and distribute drinking water shall provide sufficient information to the Italian Base Commander for authorization (see Chapter 1 for the process).

C3.3.2. General Requirements. DoD water systems, regardless of whether they produce or purchase water, will:

C3.3.2.1. Maintain a map/drawing of the complete potable water system. When the installation produces drinking water, potable water distribution system maps/drawings shall be updated every year (or sooner, if there are changes) and made available to the Italian Base Commander, upon request.

C3.3.2.2. Update the potable water system master plan at least every 5 years.

C3.3.2.3. 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 maintaining septic systems and onsite treatment units, and by appropriate land use management on DoD installations through the adoption of the following zoning criteria:

C3.3.2.3.1. Zone of Absolute Conservation: The area immediately surrounding wellheads and associated piping. Zones of absolute conservation shall be adequately protected, have a radius of at least 10 meters (33 feet) from the withdrawal points, and be used only to host the pumphouse and related utilities. The wellhead shall be placed in a pumphouse with access limited to authorized personnel. The pumphouse shall have the size and dimensions to facilitate inspections. The pumphouse shall be equipped and constructed to avoid water stagnation on the floor or infiltration from walls or roof. The wellhead closing shall be equipped with a sampling port with a threaded plug in order to facilitate groundwater level measurements and direct sampling.

C3.3.2.3.2. Zone of Respect: The area surrounding the zone of absolute conservation, which is assumed to have a 200-meter (656-foot) radius from the withdrawal point. The following activities are prohibited in the zone of respect:

C3.3.2.3.2.1. Discharge of waste, sludge, or sewage, even if purified;

C3.3.2.3.2.2. Storage of organic or chemical fertilizers or pesticides;

C3.3.2.3.2.3. Discharge of organic or chemical fertilizers or pesticides unless the utilization of such substances is conducted following a specific usage plan taking into account the nature of the soil and crops, the agricultural techniques adopted, and the vulnerability of the water resources;

C3.3.2.3.2.4. Discharge of rainwater from paved areas;

C3.3.2.3.2.5. Cemeteries;

C3.3.2.3.2.6. Operation of quarries that may be hydraulically connected to groundwater;

C3.3.2.3.2.7. Drilling of wells, except for those used for drinking water and water quality control wells (i.e., water barriers);

C3.3.2.3.2.8. Any type of waste management activity;

C3.3.2.3.2.9. Storage of any type of wastes, hazardous materials (including POLs), or radioactive materials;

C3.3.2.3.2.10. Vehicle collection, demolition, and scrap yards;

C3.3.2.3.2.11. Dry wells; and

C3.3.2.3.2.12. Grazing of livestock with nitrogen (net from storage and distribution losses) in effluents exceeding 170 kg/hectare (375 lbs/acre); holding of livestock within the limited zone of respect is prohibited.

C3.3.2.3.3. If any of the facilities or activities (except for cemeteries) described above are already present within the zone of respect, measures shall be taken to relocate the activity when feasible. If relocation is not feasible, an alternative shall be coordinated with the Italian Base Commander.

C3.3.2.3.4. Installations shall notify the Italian Base Commander, if any of the following activities currently exist or are planned within the zone of respect:

C3.3.2.3.4.1. Sewer systems;

C3.3.2.3.4.2. Residential housing;

C3.3.2.3.4.3. Railways, infrastructure, and other civil engineering works; and

C3.3.2.3.4.4. Discharge of organic or chemical fertilizers or pesticides in agriculture where there is a Regional or Provincial fertilizer/pesticide plan in place.

C3.3.2.4. 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 the Italian Base Commander.

C3.3.2.5. Provide proper treatment for all water sources. Surface water supplies, including GWUDISW, must conform to the surface water treatment requirements set forth in Table 3.1. Groundwater supplies, at a minimum, must be disinfected.

C3.3.2.6. Maintain a continuous positive pressure of at least 138 kPa (1.38 bar or 20 pounds per square inch (psi)) in the water distribution system.

C3.3.2.7. Perform water distribution system operation and maintenance practices consisting of:

C3.3.2.7.1. Maintenance of a disinfectant residual throughout the water distribution system (except where determined unnecessary by the appropriate DoD medical authority);

C3.3.2.7.2. Proper procedures for repair and replacement of mains (including disinfection and bacteriological testing);

C3.3.2.7.3. An effective annual water main flushing program;

C3.3.2.7.4. Proper operation and maintenance of storage tanks and reservoirs to include cleaning and disinfection of the storage tanks, reservoirs, and other appurtenances with frequencies based on the characteristics of the water equipment and distribution system; and

C3.3.2.7.5. Maintenance of distribution system appurtenances (including equipment used for cleaning and disinfection, hydrants and valves) to include inspections of the water distribution system and repair with frequencies based on the characteristics of the water, equipment, manufacturer's Operations & Maintenance (O&M) manual, and distribution system.

C3.3.2.8. Establish an effective cross connection control and backflow prevention program. Any structure containing a double distribution system (potable and non-potable water) shall prevent cross connections and the pipes must be distinct and easily identifiable.

C3.3.2.9. Underground injection is prohibited with the following exceptions: water from geothermal exchange systems, infiltration water from mines and quarries, or water from washing and processing of inert materials and pumped water from civil engineering work. DoD installations intending to perform underground injection shall submit sufficient information to the Italian Base Commander for authorization (see Chapter 1 for the process). Chapter 4, "Wastewater," describes the requirements and procedures for wastewater discharge authorizations and other requirements for the discharge of wastewater to surface and subsurface soil.

C3.3.2.10. 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:

C3.3.2.10.1. Plans, procedures, and identification of equipment that can be implemented or utilized in the event of an intentional or un-intentional disruption;

C3.3.2.10.2. Identification of key personnel;

C3.3.2.10.3. Procedures to restore service;

C3.3.2.10.4. Procedures to isolate damaged lines;

C3.3.2.10.5. Identification of alternative water supplies; and

C3.3.2.10.6. Installation public notification procedures.

C3.3.2.11. 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 which may be taken.

C3.3.2.12. Maintain records showing monthly operating reports for at least 3 years, and records of bacteriological results for at least 5 years, and chemical results for at least 10 years.

C3.3.2.13. Document corrective actions taken to correct breaches of criteria and maintain such records for at least three years. Cross connection and backflow prevention testing and repair records should be kept for at least 10 years.

C3.3.2.14. Conduct vulnerability assessments which include, but are not limited to, a review of:

C3.3.2.14.1. Pipes and constructed conveyances, physical barriers, water collection, pretreatment, treatment, storage, and distribution facilities, electronic, computer, or other automated systems utilized by the DoD water system;

C3.3.2.14.2. Use, storage, or handling of various chemicals; and

C3.3.2.14.3. Operation and maintenance of the water storage, treatment, and distribution systems.

C3.3.3. Testing Requirements. Regardless of whether a DoD water system produces or purchases water, it will, by independent testing or by validated supplier testing, ensure conformance with the MCLs indicated in the following tables and conformance with the following criteria. Selection of public or private laboratories shall be limited to those conducting drinking water analyses in accordance with C1.5.3. (Chapter 1, "Overview").

C3.3.3.1. Analytical testing methods shall meet the performance characteristics specified in Table 3.26, "Parameters For Which Performance Characteristics Are Specified," Table 3.27, "Italian Analytical Test Methods," and Table 3.28, "DoD-Approved Inorganic Chemical Analytical Test Methods."

C3.3.3.2. Microbiological Requirements

C3.3.3.2.1. An installation responsible for a DoD water system will conduct a bacteriological monitoring program to ensure the safety of water provided for human consumption and allow evaluation with the MCLs for microbiological parameters, which are included in Table 3.2-c, "Microbiological MCLs." The MCL is no more than 5% 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 < 40 samples per month. Further, the MCL is exceeded whenever a sample is positive for fecal coliforms, E. coli, Enterovirus, anti-E. coli bacteriophages, Pathogenic enterobacteria and Pathogenic staphylococci or any repeat sample is positive for total coliforms.

C3.3.3.2.2. Each system must develop a written, site-specific monitoring plan and collect routine samples according to Table 3.2-a, "Microbiological Parameters Monitoring Frequency" and Table 3.2-b, "Total Coliform Monitoring Frequency." Microbiological testing methods are set forth in Table 3.25, "Parameters With Specified Analytical Method."

C3.3.3.2.3. 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 downstream sample, each within five service connections of the original tap. Any additional repeat sampling which may be required will be performed according to the appropriate DoD medical authority. Monitoring will continue until total coliforms are no longer detected.

C3.3.3.2.4. 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.

C3.3.3.2.5. If a system has exceeded the MCL for any microbiological parameter listed in Table 3.2-c, "Microbiological MCLs," the installation will complete the notification in C3.3.4. to:

C3.3.3.2.5.1. 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 DoD water system is notified of the result.

C3.3.3.2.5.2. 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.

C3.3.3.3. Inorganic Chemical and Physical Requirements

C3.3.3.3.1. An installation responsible for a DoD water system will ensure that the water distributed does not exceed applicable limitations set out in Table 3.3, "Inorganic Chemical MCLs."

C3.3.3.3.2. 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.

C3.3.3.3.3. Systems will be monitored for inorganic chemicals at the frequency set in Table 3.4, "Inorganics Monitoring Requirements," and Table 3.5-a, "Minimum Frequency of Sampling."

C3.3.3.3.4. If a system is out of compliance, the installation will complete the notification in paragraph C3.3.4. 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:

C3.3.3.3.4.1. 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 DoD water system is notified of the result.

C3.3.3.3.4.2. 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 3.4, “Inorganics Monitoring Requirements” until authorities determine the system is reliable and consistent and remedial actions are completed.

C3.3.3.4. Fluoride Requirements

C3.3.3.4.1. An installation commander responsible for a DoD water system will ensure that the fluoride content of drinking water does not exceed the MCL of 4.0 mg/L stated in Table 3.3, “Inorganic Chemical MCLs.”

C3.3.3.4.2. Systems will be monitored for fluoride by collecting one treated water sample at the entry point to the distribution system in accordance with the frequencies delineated in Tables 3.4 and 3.5-a. Daily monitoring is recommended for systems practicing fluoridation using the criteria in Table 3.10, “Recommended Fluoride Concentrations at Different Temperatures.”

C3.3.3.4.3. If any sample exceeds the MCL, the installation will complete the notification in paragraph C3.3.4. as soon as possible, but in no case later than 14 days after the violation.

C3.3.3.5. Lead and Copper Requirements

C3.3.3.5.1. DoD 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% of all sampled taps.

C3.3.3.5.2. The installation shall conduct monitoring in accordance with Table 3.5-b, “Monitoring Requirements for Lead and Copper Water Quality Parameters.” High risk sampling sites will be targeted by conducting a materials evaluation of the distribution system. Sampling sites will be selected as stated in Table 3.5-b.

C3.3.3.5.3. If an action level is exceeded, the installation will collect additional water quality samples specified in Table 3.5-b, “Monitoring Requirements for Lead and Copper Water Quality Parameters.” 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 Italian) within 60 days and will complete the notification in paragraph C3.3.4 as soon as possible, but in no case later than 14 days after the violation.

C3.3.3.6. Organic Chemical Requirements

C3.3.3.6.1. An installation responsible for a DoD water system will ensure that organic chemicals in water distributed do not exceed the limitations delineated in Table 3.6 “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.

C3.3.3.6.2. Systems will be monitored for organic chemicals according to the schedule stated in Table 3.7, “Organic Chemical Monitoring Requirements.”

C3.3.3.6.3. Analytical testing methods shall meet the performance characteristics specified in Table 3.26, “Parameters For Which Performance Characteristics Are Specified.”

C3.3.3.6.4. If a system is out of compliance, the notification set out in paragraph C3.3.4 shall be completed as soon as possible, but in no case later than 14 days after the violation. The installation will immediately 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 3.7., “Organic Chemical Monitoring Requirements” and will continue until the installation commander determines the system is back in compliance, and all necessary remedial measures have been implemented.

C3.3.3.7. Disinfectant/Disinfection Byproducts (DDBP) Requirements

C3.3.3.7.1. An installation 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:

C3.3.3.7.1.1. Ensure that the MCL of 0.03 mg/L for total trihalomethanes (TTHM), the MCL of 0.060 mg/L for haloacetic acids (HAA5), the MCL of 0.7 mg/L for chlorite and the MCL of 0.01 mg/L for bromate are met in drinking water.

C3.3.3.7.1.2. Ensure that the maximum residual disinfectant level (MRDL) of 4.0 mg/L for chlorine, the MRDL of 4.0 mg/L (measured as combined total chlorine) for chloramines when ammonia is added during chlorination, and the MRDL of 0.8 mg/L for chlorine dioxide are met in drinking water. Operators may increase residual disinfectant levels of chlorine or chloramines (but not chlorine dioxide) in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems caused by circumstances such as distribution line breaks, storm runoff events, source water contamination, or cross-connections.

C3.3.3.7.1.3. Such systems that add a disinfectant will monitor TTHM and HAA5 in accordance with Table 3.8, “Disinfectant/Disinfection Byproducts Monitoring Requirements.” Additional disinfectant and disinfection byproduct monitoring for systems that utilize chlorine dioxide, chloramines, or ozone are also included in Table 3.8.

C3.3.3.7.1.4. For TTHM and HAA5 a system is noncompliant when the running annual average of quarterly averages of all samples taken in the distribution system, computed quarterly, exceed the MCL for TTHM, 0.03 mg/L, or the MCL for HAA5, 0.060 mg/L. Refer to Table 3.8 for chlorine, chloramine, and chlorine dioxide compliance requirements. If a system is out of compliance as described in Table 3.8, the installation will accomplish the notification requirements outlined in paragraph C3.3.4. as soon as possible, but in no case later than 14 days after the violation, and undertake remedial measures.

C3.3.3.8. Radionuclide Requirements

C3.3.3.8.1. An installation responsible for a DoD water system will test the system for conformance with the applicable radionuclide limits contained in Table 3.9, “Radionuclide MCLs and Monitoring Requirements.”

C3.3.3.8.2. Systems will perform radionuclide monitoring as stated in Table 3.9.

C3.3.3.8.3. If the average annual MCL for gross alpha activity or radium is exceeded, the installation will complete the notification according to the procedures in paragraph C3.3.4. 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.

C3.3.3.9. Surface Water Treatment Requirements

C3.3.3.9.1. DoD water systems that use surface water sources or GWUDISW will meet the surface water treatment requirements delineated in Table 3.1.

C3.3.3.9.2. If the turbidity readings in Table 3.1 are exceeded, the installation will complete the notification in C3.3.4. as soon as possible, but in no case later than 14 days after the violation, and undertake remedial action. Surface water and GWUDISW systems that make changes to their disinfection practices (e.g., change in disinfectant or application point) in order to meet DDBP requirements (C3.3.3.7.), will ensure that protection from microbial pathogens is not compromised.

C3.3.3.10. Alternative Water Supplies

C3.3.3.10.1. 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.

C3.3.3.11. Filter Backwash Requirements

C3.3.3.11.1. To prevent microbes and other contaminants from passing through and into finished drinking water, DoD water systems will ensure that recycled streams (i.e., recycled filter backwash water, sludge thickener supernatant, and liquids from dewatering processes) are treated by direct and conventional filtration processes. This requirement only applies to DoD water systems that:

C3.3.3.11.1.1. Use surface water or GWUDISW;

C3.3.3.11.1.2. Use direct or conventional filtration processes; and

C3.3.3.11.1.3. Recycle spent filter backwash water, sludge thickener supernatant, or liquids from dewatering processes.

C3.3.4. 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. Base Commander and Italian Base Commander) 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 being taken to correct the violation, the necessity for seeking an 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.

C3.3.5. System Operator Requirements. DoD installations will ensure that personnel are appropriately trained to operate DoD water systems. At a minimum, certification shall be for the class of water treatment plant operated. Certification shall meet the requirements of a recognized U.S. certification body such as the Association of Boards of Certification and/or the Italian equivalent.

Table 3.1. Surface Water Treatment Requirements

1. Unfiltered Systems a. Systems which use unfiltered surface water or GUDISW will analyze the raw water for total coliforms or fecal coliforms at least weekly and for turbidity at least daily, and must continue as long as the unfiltered system is in operation. If the total coliforms and/or fecal coliforms exceed 100/100 milliliters (mL) and 20/100 mL, respectively, in excess of 10% of the samples collected in the previous 6 months, appropriate filtration must be applied. Appropriate filtration must also be applied if turbidity of the source water immediately prior to the first or only point of disinfectant application exceeds 1 Nephelometric Turbidity Units (NTU). b. Disinfection must achieve at least 99.9% (3-log) inactivation of <i>Giardia lamblia</i> cysts and 99.99% (4-log) inactivation of viruses by meeting applicable CT values, as shown in Tables 3.11. through 3.24. 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 four hours that the system is in operation. Disinfectant residual measurements in the distribution system will be made at the same times as total coliforms are sampled. e. Disinfectant residual of water entering the distribution system cannot be < 0.2 mg/L for > 4 hours. f. Water in a distribution system with a heterotrophic bacteria concentration $\leq$ 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% 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% (3-log) removal and/or inactivation of <i>Giardia lamblia</i> cysts and 99.99% (4-log) removal and/or inactivation of viruses. b. The turbidity of filtered water will be monitored at least once every four hours. The turbidity of filtered water for direct and conventional filtration systems will not exceed 0.5 NTU (1 NTU for slow sand and diatomaceous earth filters) in 95% of the analyses in a month, with a maximum of 1 NTU. c. Disinfection must provide the remaining log-inactivation of <i>Giardia lamblia</i> 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 typically removes 2.0-log *Giardia*/ 2.0-log viruses. Less log-removal may be assumed if treatment is not properly applied.

3. SW or GWUDISW systems will provide at least 99% (2-log) removal of *Cryptosporidium*. A system is considered to be compliant with the *Cryptosporidium* removal requirements if:

- a. For conventional and direct filtration systems, the turbidity level of the system's combined filter effluent water does not exceed 0.3 NTU in at least 95% of the measurements taken each month and at no time exceeds 1 NTU.
- b. For slow sand and diatomaceous earth filtration plants, the turbidity level of the system's combined filter effluent water at no time exceeds 1 NTU.
- c. For alternative systems, the system demonstrates to the appropriate medical authority that the alternative filtration technology, in combination with disinfection treatment, consistently achieves 3-log removal and/or inactivation of *Giardia lamblia* cysts, 4-log removal and/or inactivation of viruses, and 2-log removal of *Cryptosporidium* oocysts.
- d. For unfiltered systems, the system continues to meet the source water monitoring requirements noted in 1a above to remain unfiltered.

4. Individual Filter Effluent Monitoring. Conventional or direct filtration systems must continuously monitor (every 15 minutes) the individual filter turbidity for each filter used at the system. Systems with two or fewer filters may monitor combined filter effluent turbidity continuously, in lieu of individual filter turbidity monitoring. If a system exceeds 1.0 NTU in two consecutive measurements for three months in a row (for the same filter), the installation must conduct a self-assessment of the filter within 14 days. The self-assessment must include at least the following components: assessment of filter performance; development of a filter profile; identification and prioritization of factors limiting filter performance; assessment of the applicability of corrections; and preparation of a self-assessment report. If a system exceeds 2.0 NTU (in two consecutive measurements 15 minutes apart) for two months in a row, a Comprehensive Performance Evaluation (CPE) must be conducted within 90 days by a third party.

5. Covers for Finished Water Storage Facilities. Installations must physically cover all finished water reservoirs, holding tanks, or storage water facilities.

Table 3.2-a. Microbiological Parameters Monitoring Frequency

Parameter	Monitoring
Total Coliforms	See Table 3.2-b
Escherichia coli (E.coli)	Check Monitoring ¹ and See C3.3.3.2.1
Enterococci	Audit Monitoring ¹
Colony count 22 °C and 37°C	Audit Monitoring ¹
Clostridium perfringens (including spores)	If GWUDISW, Check Monitoring ¹ Otherwise, Audit Monitoring ¹
Pathogenic staphylococci, pathogenic enterobacteria, anti-E. coli bacteriophages, Enterovirus, Pseudomonas aeruginosa, protozoa, helminthes, algae, fungi	Only if requested by ASL

Note:

1. See Table 3.5-a

Table 3.2-b. 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. DoD water systems serving < 25 people shall periodically monitor for total coliforms.

Systems that use groundwater, serve < 4,900 people, 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 3.2-c. Microbiological MCLs

Parameter	MCL	Unit
Escherichia coli (E. coli)	0	Number /100 mL
Coliform bacteria (at 37°C)	0	Number /100 mL
Enterococci	0	Number /100 mL
Enumeration of culturable microorganisms - Colony count 22°C	No abnormal changes	Number/100 mL
Enumeration of culturable microorganisms - Colony count 37°C	0	Number/100 mL
Clostridium perfringens (including spores)	0	Number /100 mL
Pathogenic staphylococci	0	Number /250 mL
Pathogenic enterobacteria	0	Number / 1 L
Anti-E. coli bacteriophages	0	Number /100 L
Enterovirus	0	Number /100 L
Pseudomonas aeruginosa ⁽¹⁾	-	Number /250 mL
Protozoa ⁽¹⁾	-	Number / 100 L
Helmintes ⁽¹⁾	-	Number / 1 L
Algae ⁽¹⁾	-	Number / 1 L
Fungi ⁽¹⁾	-	Number /100 mL

Note:

1. MCLs are not defined; only sample volumes are defined.

Table 3.3. Inorganic Chemical MCLs

Contaminant	MCL	
Aluminum	0.2	mg/L
Ammonium	0.50	mg/L
Arsenic	0.010	mg/L
Antimony	0.005	mg/L
Asbestos	7 million	fibers/L (longer than 10 μm)
Barium	2.0	mg/L
Beryllium	0.004	mg/L
Boron	1.0	mg/L
Bromate	0.010	mg/L
Cadmium	0.005	mg/L
Chlorides ⁽¹⁾	250	mg/L
Chlorite	0.2	mg/L
Chromium	0.050	mg/L
Copper ⁽²⁾	1.0	mg/L
Conductivity ⁽¹⁾	2,500	μScm^{-1} at 20°C
Cyanide	0.050	mg/L (as free cyanide)
Dry residues ⁽⁶⁾	1,500	mg/L (at 180°C)
Fluoride	4.0	mg/L
Hydrogen ion concentration ⁽¹⁾	6.5 – 9.5	pH Unit
Iron	0.200	mg/L
Lead ⁽²⁾	0.010	mg/L
Manganese	0.050	mg/L
Mercury	0.001	mg/L
Nickel	0.020	mg/L
Nitrate	44.3 (as NO_3) 10 (as N)	mg/L
Nitrite	0.5 (as NO_2) 0.15 (as N)	mg/L
Total Nitrite and Nitrate	10	mg/L (as N)
Oxidizability ⁽³⁾	5.0	mg/L O2
Selenium	0.010	mg/L

Contaminant	MCL	
Sodium	200	mg/L
Sulfates ⁽¹⁾	250	mg/L
Thallium	0.002	mg/L
Total hardness ^{(4) (5)}	15-50 150 – 500	°F French Degree mg/L (as CaCO ₃)
Vanadium	0.140	mg/L

Notes:

1. Water should not be aggressive.
2. This value applies to a sample of water intended for human consumption obtained by an adequate sampling method at the tap and taken so as to be representative of a weekly average ingested by consumers. See C3.3.3.5. for copper and lead Action Level requirements, which are indicators of potential water system corrosion.
3. The parameter need not be measured if the parameter TOC is analyzed.
4. Guidance values.
5. Lower limit is valid for water treated by water softener or by desalination equipment.
6. Guidance maximum value.

Table 3.4. Inorganics Monitoring Requirements

Parameter	Frequency (See Table 3.5a)	Note
Aluminum	Check Monitoring	Necessary only when used as flocculants or present, in significant concentration, in the drinking water source utilized
Ammonia	Check Monitoring	
Antimony	Audit monitoring	
Arsenic	Audit monitoring	
Asbestos	1 sample every 9 years	Necessity for analysis is predicated upon a sanitary survey conducted by the DoD water system
Barium	1 sample every 3 years	The frequency must be increased to an annual sample if water is produced from Surface Water
Beryllium	1 sample every 3 years	The frequency must be increased to an annual sample if water is produced from Surface Water
Boron	Audit monitoring	
Bromate	Audit monitoring	
Cadmium	Audit monitoring	
Chlorides	Audit monitoring	
Chlorite	Audit monitoring	
Chromium	Audit monitoring	
Copper	Audit monitoring	
Color	Check Monitoring	
Conductivity	Check Monitoring	
Cyanide	Audit monitoring	
Dry Residues at 180 °C	Audit monitoring	
Fluoride	Audit monitoring	Daily monitoring is recommended for systems practicing fluoridation (see Table 3.10 for fluoridation criteria)
Hydrogen ion concentration	Check Monitoring	
Iron	Check Monitoring	Necessary only when used as flocculant.
Lead	Audit monitoring	
Manganese	Audit monitoring	
Mercury	Audit monitoring	
Nickel	Audit monitoring	
Nitrate ^(1,2)	Audit monitoring	
Nitrite ^(1,2)	Check Monitoring	Necessary only when chloramine disinfectant is used
Total	Annual sample	The frequency must be increased to quarterly

Parameter	Frequency (See Table 3.5a)	Note
Nitrate/Nitrite ⁽²⁾		if water is produced from Surface Water
Odor	Check Monitoring	
Oxidizability	Audit monitoring	
Residual Disinfectants	Check Monitoring	Necessary only when disinfectant is used
Selenium	Audit monitoring	
Sodium	Audit monitoring	
Sulfates	Audit monitoring	
Taste	Check Monitoring	
Thallium	1 sample every 3 years	The frequency must be increased to a annual sample if water is produced from Surface Water
Total hardness	Audit monitoring	
Turbidity	Check Monitoring	
Vanadium	Audit monitoring	

Notes:

1. Increased quarterly monitoring (2 samples per quarter for groundwater systems and at least 4 samples per quarter for surface water systems) shall be undertaken for nitrate and nitrite if a sample is >50% of the MCL.
2. If result is >50% nitrite MCL (which is 0.075 mg/L), increased quarterly monitoring is triggered (2 samples per quarter for groundwater systems and at least 4 samples per quarter for surface water systems) and sampling for nitrate and nitrite shall commence on a quarterly basis for surface water.

Table 3.5-a. Minimum Frequency of Sampling

Volume of water distributed or produced each day within a supply zone (m³) (1) (2)	Check Monitoring Number of Samples for Year (3)	Audit monitoring Number of Samples for Year (3)
≤ 1,000 ⁽⁴⁾	4	1
1,001 to 10,000	4 + 3 for each 1,000 m ³ /d and part thereof of the total volume	1 + 1 for each 3,300 m ³ /d and part thereof of the total volume
10,001 to 100,000		3 + 1 for each 10,000 m ³ /d and part thereof of the total volume
>100,000		10 + for each 25,000 m ³ /d and part thereof of the total volume

Notes:

1. A supply zone is a geographically defined area within which water intended for human consumption comes from one or more sources and within which water quality may be considered as being approximately uniform.
2. The volumes are calculated as averages over a calendar year. In order to determine the minimum frequency, the number of inhabitants in a supply zone may be used instead of water volume, assuming a water consumption of 200 l/day/capita.
3. To the extent possible, the number of samples should be distributed equally in time and location.
4. If the volume is < 100 m³, monitoring frequency requirements are at the discretion of the local Health Board (ASL), or the DoD medical authority, whichever is more stringent.

Example Calculation:

For 75,250 m³/d of distributed water, the following samples should be collected in one year:

Check monitoring: $4 + 3 \times (75,000 / 1,000 + 1) = 232$

Audit monitoring: $3 + 1 \times (70,000 / 10,000 + 1) = 11$

Table 3.5-b. Monitoring Requirements for Lead and Copper Water Quality Parameters

Population Served	No. of Sites for Standard Monitoring^{1, 2}	No. of Sites for Reduced Monitoring³	No. of Sites for Water Quality Parameters⁴
>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. Priority will be given to single family residences and structures which contain copper pipe with lead solder installed after 1982, contain lead pipes, or are served by lead service lines; then, structures, including multi-family residences with the foregoing characteristics; and finally, residences and structures with copper pipe with lead solder installed before 1983. 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 2 consecutive 6-month monitoring periods. Any small or medium-sized system (<50,000) that meets the lead and copper action levels during three consecutive years may reduce the monitoring for lead and copper from annually to once every three 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 3.6. Organic Chemical MCLs

Parameter	MCL (mg/L)	Detection Limit (mg/L)
Pesticides/PCBs		
Alachlor ³	0.0001	
Aldicarb ³	0.0001	
Aldicarb sulfone ³	0.0001	
Aldicarb sulfoxide ³	0.0001	
Aldrin	0.00003	
Atrazine ³	0.0001	0.0001
Benzo[a]pyrene	0.00001	
Carbofuran ³	0.0001	
Chlordane ³	0.0001	
Dalapon ³	0.2	
2,4-D ³	0.0001	0.0001
1,2-Dibromo-3-chloropropane (DBCP) ³	0.0001	0.00002
Di (2-ethylhexyl) adipate	0.4	
Di (2-ethylhexyl) phthalate	0.006	
Dieldrin	0.00003	
Dinoseb ³	0.0001	
Diquat ³	0.0001	
Endrin ³	0.0001	0.00002
Endothall ³	0.0001	
Ethylene dibromide (EDB)	0.00005	0.00001
Glyphosphate ³	0.0001	
Heptachlor	0.00003	
Heptachlorepoxyde	0.00003	
Hexachlorobenzene	0.001	
Hexachlorocyclopentadiene	0.05	
Lindane ³	0.0001	0.00002
Methoxychlor ³	0.0001	0.0001
Oxamyl (Vydate) ³	0.0001	
PCBs (as decachlorobiphenyls)	0.0005	0.0001
Pentachlorophenol ³	0.0001	0.00004
Picloram ³	0.0001	
Simazine ³	0.0001	

Parameter	MCL (mg/L)	Detection Limit (mg/L)
2,3,7,8-TCDD (Dioxin)	0.00000003	
Toxaphene ³	0.0001	
2,4,5-TP (Silvex) ³	0.0001	0.0002
Pesticides- Total ^{3, 4}	0.0005	
Volatile Organic Compounds/Semi-Volatile Organic Compounds		
Benzene	0.001	
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	0.003	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
Polycyclic aromatic hydrocarbons (PAH) ⁵	0.0001	
Styrene	0.1	0.0005
Tetrachloroethylene	0.005	0.0005
Trichloroethylene	0.005	0.0005
Tetrachloroethene-Trichloroethene ⁶	0.01	
Toluene	1.0	0.0005
Vinyl chloride ²	0.0005	0.0005
Xylene (total)	10	0.0005
Other Organics		
Acrylamide ^{1, 2}	0.0001 mg/L	
Epihydrochlorin ^{1, 2}	0.0001 mg/L	
Total organic carbons (TOC) ^{7,9}	No abnormal changes	
Total trihalomethanes ^{8,9}	0.03 mg/L	

Notes:

1. Only applies when adding these polymer flocculants to the treatment process. No sampling is required, the system must certify that dosing is within specified limits.
2. The MCL refers to the residual monomer concentration in the water as calculated according to specifications of the maximum release from the corresponding polymer in contact with the water.
3. Pesticides means:

- organic insecticides
 - organic herbicides
 - organic fungicides
 - organic nematocides
 - organic acaricides
 - organic algicides
 - organic rodenticides
 - organic slimicides
 - related products (inter alia, growth regulators) and their relevant metabolites, degradation and reaction products. Only those pesticides which are likely to be present in a given supply need to be monitored. They include Alachlor, Aldicarb, Aldicarb Sulfone, Aldicarb Sulfoxide, Atrazine, Carbofuran, Chloradane, Dalapon, 2,4-D, 1,2- Dibromo-3-chloropropane (DBCP), Dinoseb, Diquat, Endrin, Endothall, Glyphosate, Heptachlor, Heptachlor Epoxide Lindane Methoxychlor, Oxamyl, Pentachlorophenol, Picloram, Simazine, Silvex (2,4,5-TP³), Toxaphene. The MCL applies to each individual pesticide. The MCL for Total Pesticides excludes dalapon.
4. Pesticides -Total means the sum of all individual pesticides detected and quantified in the monitoring procedure.
 5. Sum of concentration of specified compounds. The specified compounds are:
 - benzo[b]fluoranthene
 - benzo[k]fluoranthene
 - benzo[ghi]perylene
 - indeno[1, 2, 3-cd]pyrene
 6. Sum of concentration of specified parameters.
 7. This parameter needs not to be measured for water supply systems of < 10,000 m³ a day.
 8. The MCL of TTHM is referred to the concentration sum of the following specific compounds: chloroform, bromoform, dibromochloromethane, bromodichloromethane.
 9. See Table 3.8 for monitoring requirements.

Table 3.7. Organic Chemical Monitoring Requirements

Contaminant	Base Requirement ¹		Trigger for more monitoring ²	Reduced monitoring
	Groundwater	Surface water		
VOCs/SVOCs	Quarterly	Quarterly	>0.0005 mg/L	Yes ^{3, 4}
Pesticides/PCBs	4 quarterly samples/3 years 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 which is representative of each source after treatment. For DoD water systems, monitoring compliance is to be met within 1 year of the publishing of the OEBGD (FGS).
2. Increased monitoring requires a minimum of 2 samples per quarter for groundwater systems, and at least 4 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 sanitary survey of the DoD water system.
5. Detection limits as determined by the best available testing methods.
6. Repeat sampling frequency may be reduced to the following if after one round of no detection: systems >3,300 reduce to a minimum of 2 samples per quarter in one year during each repeat compliance period, or systems <3,300 reduce to a minimum of 1 sample every 3 years.
7. 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 3.8. Disinfectant/Disinfection Byproducts Monitoring Requirements

Source Water Type	Population Served by System	Analyte & Frequency of Samples	Number of Samples
Surface Water (SW) or Groundwater Under the Direct Influence of Surface Water (GWUDISW)	10,000 or more	TTHM & HAA5 – Quarterly ^{1,2}	4 ^{1,2,3}
SW or GWUDISW	Serving 500 to 9,999	TTHM & HAA5 - Quarterly ⁴	1 ^{5,6}
SW or GWUDISW	499 or less	TTHM & HAA5 - Yearly	1 ^{7,8}
Ground Water (GW)	10,000 or more	TTHM & HAA5 - Quarterly ⁹	1 ^{10,11}
GW	9,999 or less	TTHM & HAA5 - Yearly ¹²	1 ^{13,14}
		Chlorite - Daily & Monthly ^{15,16,17,18}	
		Bromate - Monthly ^{19,20}	
		Chlorine ^{21,22}	
		Chloramines ^{23,24}	
		Chlorine Dioxide ^{25,26,27}	
		TOC ²⁸	

Notes:

1. For TTHM and HAA5, a DoD system using surface water or GWUDISW that treats its water with a chemical disinfectant must collect the number of samples listed above. 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.
2. To be eligible for reduced monitoring, a system must meet all of the following conditions: a) the annual average for TTHM is no more than 0.030 mg/L; b) the annual average for HAA5 is no more than 0.030 mg/L; c) at least one year of routine monitoring has been completed; and d) the annual average source water total organic carbon level is no more than 4.0 mg/L prior to treatment. Systems may then reduce monitoring of TTHM and HAA5 to one sample per treatment plant per quarter. Systems remain on the reduced schedule as long as the average of all samples taken in the year is no more than 0.030 mg/L for TTHM and 0.045 mg/L for HAA5. Systems that do not meet these levels must revert to routine monitoring the following quarter.
3. A system is noncompliant if the running annual average for any quarter exceeds the TTHM MCL, 0.030 mg/L or the HAA5 MCL, 0.060 mg/L.
4. One sample must be collected per treatment plant in the system at the point of maximum residence time in the distribution system.
5. Systems meeting the eligibility requirements in Note 2 may reduce monitoring frequency to one sample per treatment plant per year. Sample must be taken at the point of maximum residence time in the distribution system and during the month of warmest water temperature. Systems remain on the reduced schedule as long as the average of all samples taken in the year is no more than 0.030 mg/L for TTHM and 0.045 mg/L

for HAA5. Systems that do not meet these levels must revert to routine (quarterly) monitoring the following quarter.

6. A system is noncompliant if the annual average of all samples taken that year exceeds the TTHM MCL, 0.030 mg/L or the HAA5 MCL, 0.060 mg/L.
7. Sample must be taken at the point of maximum residence time in the distribution system and during the month of warmest water temperature. If annual sample exceeds MCL (TTHM or HAA5) the system must increase monitoring to one sample per treatment plant per quarter at the point of maximum residence time. The system may return to routine monitoring if the annual average of quarterly samples is no more than 0.030 mg/L for TTHM and 0.045 mg/L for HAA5.
8. No reduced monitoring schedule is available. Noncompliance exists when the annual sample (or average of annual samples is conducted) exceeds the TTHM MCL, 0.030 mg/L or if the HAA5 concentration exceeds the MCL, 0.060 mg/L.
9. For TTHM and HAA5, a DoD system using only ground water NOT under the influence of surface water that treats its water with a chemical disinfectant must collect the number of samples listed above. Samples must be taken at a location in the distribution system reflecting the maximum residence time of water in the system.
10. System may reduce monitoring to one sample per treatment plant per year if the system meets all of the following conditions: a) the annual average for TTHM is no more than 0.030 mg/L; b) the annual average for HAA5 is no more than 0.030 mg/L; and c) at least one year of routine monitoring has been completed. Sample must be taken at the point of maximum residence time in the distribution system and during the month of warmest water temperature. Systems remain on the reduced schedule as long as the average of all samples taken in the year is no more than 0.030 mg/L for TTHM and 0.045 mg/L for HAA5. Systems that do not meet these levels must revert to routine monitoring the following quarter.
11. Noncompliance exists when the annual average of quarterly averages of all samples, compounded quarterly, exceeds the TTHM MCL, 0.030 mg/L or the HAA5 the MCL, 0.060 mg/L.
12. For TTHM and HAA5, a DoD system using only ground water NOT under the influence of surface water that treats its water with a chemical disinfectant must collect the number of samples listed above. One sample per treatment plant must be taken at a location in the distribution system reflecting the maximum residence time of water in the system and during the month of warmest water temperature. If the sample exceeds the MCL, the system must increase monitoring to quarterly.
13. System may reduce monitoring to one sample per three-year monitoring cycle if the system meets all the following conditions: a) the annual average for TTHM is no more than 0.030 mg/L; b) the annual average for HAA5 is no more than 0.030 mg/L; and c) at least one year of routine monitoring has been completed. Sample must be taken at the point of maximum residence time in the distribution system and during the month of warmest water temperature. Systems remain on the reduced schedule as long as the average of all samples taken in the year is no more than 0.030 mg/L for TTHM, and 0.045 mg/L for HAA5. Systems that do not meet these levels must revert to routine monitoring. Systems on increased monitoring may return to routine monitoring if the annual average of quarterly samples does not exceed 0.030 mg/L for TTHM and 0.045 mg/L for HAA5.
14. Noncompliance exists when the annual sample (or average of annual samples) exceeds the TTHM MCL, 0.030 mg/L or the HAA5 the MCL, 0.060 mg/L.
15. For systems using chlorine dioxide for disinfection or oxidation, daily samples are taken for chlorite at the entrance to the distribution system for chlorite. The monthly chlorite samples are collected within the distribution system, as follows: one as close as possible to the first customer, one in a location representative of average residence time, and one as close as possible to the end of the distribution system (reflects maximum residence time within the distribution system).
16. Additional monitoring is required when a daily sample exceeds the chlorite MCL, 0.70 mg/L. A three-sample set (following the monthly sample set protocol) is required to be collected the following day. Further distribution system monitoring will not be required in that month unless the chlorite concentration at the entrance to the distribution system again exceeds the MCL, 0.70 mg/L.
17. For chlorite, systems may reduce routine distribution system monitoring from monthly to quarterly if the chlorite concentration in all samples taken in the distribution system is below the MCL, 0.70 mg/L, for a period of one year and the system has not been required to conduct any additional monitoring. Daily samples must still be collected. Monthly sample set monitoring resumes when if any one daily sample exceeds the MCL, 0.70 mg/L.
18. Noncompliance for chlorite exists if the average concentration of any three-sample set (i.e., one monthly sample set from within the distribution system) exceeds the MCL, 0.70 mg/L.

19. Systems using ozone for disinfection or oxidation are required to take at least one sample per month from the entrance to the distribution system for each treatment plant in the system using ozone under normal operating conditions. Systems may reduce monitoring from monthly to once per quarter if the system demonstrates that the yearly average raw water bromide concentration is < 0.05 mg/L based upon monthly measurements for one year.
20. Noncompliance is based on a running yearly average of samples, computed quarterly, that exceeds the MCL, 0.01 mg/L.
21. Chlorine samples must be measured at the same points in the distribution system and at the same time as total coliforms. Notwithstanding the MRDL, operators may increase residual chlorine levels in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems. The installation will ensure that concentration of residual disinfectants at the ends of the distribution line is maintained at a minimum of 0.2 mg/L. Residual disinfectants may fluctuate below 0.2 mg/L for a maximum period of 4 hours if the disinfectant is added as a precautionary measure.
22. Noncompliance is based on a running yearly average of monthly averages of all samples, computed quarterly, that exceeds the MRDL, 4.0 mg/L.
23. Chloramine samples (as either total chlorine or combined chlorine) must be measured at the same points in the distribution system and at the same time as total coliforms. Notwithstanding the MRDL, operators may increase residual chlorine levels in the distribution system to a level and for a time necessary to protect public health to address specific microbiological contamination problems. The installation will ensure that concentration of residual disinfectants at the ends of the distribution line is maintained at a minimum of 0.2 mg/L. Residual disinfectants may fluctuate below 0.2 mg/L for a maximum period of 4 hours if the disinfectant is added as a precautionary measure.
24. Noncompliance is based on a running yearly average of monthly averages of all samples, computed quarterly, that exceeds the MRDL, 4.0 mg/L.
25. For systems using chlorine dioxide for disinfection or oxidation, samples must be taken daily at the entrance to the distribution system. If the MRDL, 0.8 mg/L, is exceeded, three additional samples must be taken the following day as follows: one as close as possible to the first customer, one in a location representative of average residence time, and one as close as possible to the end of the distribution system (reflects maximum residence time within the distribution system). Systems not using booster chlorination systems after the first customer must take three samples in the distribution system as close as possible to the first customer at intervals of not < 6 hours.
26. If any daily sample from the distribution system exceeds the MRDL and if one or more of the three samples taken the following day from within the distribution system exceeds the MRDL, the system is in violation of the MRDL and must issue public notification in accordance with paragraph C3.3.4. If any two consecutive daily samples exceed the MRDL but none of the distribution samples exceed the MRDL, the system is in violation of the MRDL. Failure to monitor at the entrance to the distribution system on the day following an exceedance of the chlorine dioxide MRDL is also an MRDL violation.
27. The MRDL for chlorine dioxide may NOT be exceeded for short periods to address specific microbiological contamination problems.
28. Systems that use conventional filtration treatment must monitor each treatment plant water source for TOC on a monthly basis. Samples must be taken from the source water prior to treatment and the treated water not later than the point of combined filter effluent turbidity monitoring. Source water alkalinity must also be monitored at the same time. Surface water and GWUDISW systems with average treated water TOC of < 2.0 mg/L for two consecutive years, or < 1.0 mg/L for one year, may reduce TOC and alkalinity to one paired sample per plant per quarter.

Table 3.9. Radionuclide MCLs and Monitoring Requirements

Contaminant	MCL
Gross Alpha ¹	15 pCi/L
Combined Radium-226 and -228	5 pCi/L
Beta Particle and Photon Radioactivity ²	4 mrem/yr
Uranium	30 µg/L
Tritium ⁴	100 Bequerel/L
Total Indicative Dose ^{3,4}	0.10 MSv/year

Notes:

1. Gross alpha activity includes radium-226, but excludes radon and uranium.
2. Beta particle and photon activity is also referred to as gross beta activity from manmade radionuclides.
3. Excluding tritium, potassium-40, radon and radon decay products.
4. Monitoring frequencies and analytical methods have not been set yet.

Monitoring Requirements:

All installations using ground water, surface water, or systems using both ground and surface water must sample at every point (i.e., sampling points) to the distribution system that is representative of all sources being used under normal operating conditions.⁵

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 4 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 ≤ 5 picoCuries per liter (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 MCL, 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 3.10. Recommended Fluoride Concentrations at Different Temperatures

Annual Average of Maximum	Control Limits (mg/L)		
Daily Air Temperatures (°F)	Lower	Optimum	Upper
50.0 - 53.7	0.9	1.2	1.5
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 3.11. 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 3.12. *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 3.13. 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 3.14. 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 3.15. 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 3.16. 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 3.17. CT Values for Inactivation of Viruses by Free Chlorine

Temperature (C)	Log Inactivation 2.0 pH		Log Inactivation 3.0 pH		Log Inactivation 4.0 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 3.18. 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 3.19. 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 3.20. 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 3.21. 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 3.22. 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 3.23. 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 3.24. CT Values for Inactivation of Viruses by UV

Log Inactivation	
2.0	3.0
21	36

Table 3.25. Parameters with Specified Analytical Method

Parameter	Methodology	ISS ¹ Analytical Method Code
Escherichia coli (E. coli)	MPN (Most Probable Number)	ISS A 001A rev.00
	Membrane Filtration	ISS A 001B rev.00
	Membrane Filtration	ISS A 001C rev.00
Enterococci	Membrane Filtration	ISS A 002A rev.00
Pseudomonas aeruginosa	Membrane Filtration	ISS A 003A rev.00
Colony count 22 °C	Plate Culture (Agar)	ISS A 004A rev.00
Clostridium Perfringens (including spores)	Membrane Filtration	ISS A 005A rev.00
	Membrane Filtration	ISS A 005B rev.00
Coliforms (37°C)	MPN (Most Probable Number)	ISS A006A rev.00
	Membrane Filtration	ISS A 006B rev.00
	Membrane Filtration	ISS A 006C rev.00
Algae	Sedimentation with microscopic technique	ISS A 007A rev.00
Anti-E. coli Bacteriophages	MPN (Most Probable Number)	ISS A 008A rev.00
	Plaque Count (lysis)	ISS A 008B rev.00
	Presence/Absence	ISS A 008C rev.00
F-specific RNA Bacteriophages	Plaque Assay (lysis)	ISS A 009A rev.00
Free-living Nematodes	Sedimentation with microscopic technique	ISS A 0010A rev.00
	Membrane Filtration with microscopic technique	ISS A 0010B rev.00
Salmonella	Presence/Absence	ISS A 0011A rev.00
	Presence/Absence	ISS A 0011B rev.00
	Presence/Absence	ISS A 0011C rev.00
Shigella	Presence/Absence	ISS A 0012A rev.00
	Presence/Absence	ISS A 0012B rev.00
	Presence/Absence	ISS A 0012C rev.00
Vibrio	Presence/Absence	ISS A 0013A rev.00
Aeromonas	Membrane Filtration	ISS A 0014A rev.00
Enterovirus	Concentration and Isolation on Cellulose Culture, Immunofluorescence, ELISA, PCR	ISS A 0015A rev.00
Fungi	Membrane Filtration	ISS A 0016A rev.00

Parameter	Methodology	ISS ¹ Analytical Method Code
	Membrane Filtration	ISS A 0016B rev.00
	Membrane Filtration	ISS A 0016C rev.00
Giardia and Cryptosporidium	Capsule Filtration and Direct Immunofluorescence	ISS A 0017A rev.00
		ISS A 0017B rev.00
	Compressed Foam Filtration and Direct Immunofluorescence	ISS A 0017C rev.00
	PCR and Nested-PCR Real-Time PCR	ISS A 0017D rev.00
Pathogenic Staphylococci	Membrane Filtration	ISS A 0018A rev.00
	Membrane Filtration	ISS A 0018B rev.00

Note:

1. The composition of m-CP agar is:

Basal medium	
Tryptose	30 g
Yeast Extract	20 g
Sucrose	5 g
L-Cystein Hydrochloride	1 g
MgSO ₄ * 7 H ₂ O	0.1 g
Bromocresol purple	40 mg
Agar	15 g
Water	1,000 mL

Dissolve the ingredients of the basal medium, adjust pH to 7.6 and autoclave at 121 °C (250 °F) for 15 minutes. Allow the medium to cool and add:

D-cycloserine	400 mg
Polymyxine – B sulfate	25 mg
Indoxyl β D-glucoside to be dissolved in 8 mL of sterile water before addition	60 mg
Filter-sterilized 0.5 % phenolphthalein diphosphate solution	20 mL
Filter-sterilized 4.5% FeCl ₃ *6 H ₂ O	2 mL

Table 3.26. Parameters For Which Performance Characteristics Are Specified

Parameter	Accuracy (Trueness) % of MCL ⁽¹⁾	Precision % of MCL ⁽²⁾	Limit of detection % of MCL ⁽³⁾
Acrylamide	To be controlled by product specification		
Aluminum	10	10	10
Ammonium	10	10	10
Antimony	25	25	25
Arsenic	10	10	10
Benzo[a]pyrene	25	25	25
Benzene	25	25	25
Boron	10	10	10
Bromate	25	25	25
Cadmium	10	10	10
Chloride	10	10	10
Chromium	10	10	10
Conductivity	10	10	10
Copper	10	10	10
Cyanide ⁽⁴⁾	10	10	10
1,2 dichloroethane	25	25	10
Epichlorohydrin	To be controlled by product specification		
Fluoride	10	10	10
Hydrogen ion concentration	The method of analysis used must be capable of measuring concentrations equal to the MCL with a trueness of 0.2 pH unit and a precision of 0.2 pH unit.		
Iron	10	10	10
Lead	10	10	10
Manganese	10	10	10
Mercury	20	10	20
Nickel	10	10	10
Nitrate	10	10	10
Nitrite	10	10	10
Oxidizability ⁽⁵⁾	25	25	10
Pesticides ⁽⁶⁾	25	25	25
Polycyclic aromatic hydrocarbons ⁽⁷⁾	25	25	25
Selenium	10	10	10
Sodium	10	10	10
Sulfate	10	10	10
Tetrachloroethene ⁽⁸⁾	25	25	10
Trichloroethene ⁽⁸⁾	25	25	10
Trihalomethanes Total ⁽⁷⁾	25	25	10
Vinyl Chloride	To be controlled by product specification		

Notes:

1. Trueness is the systematic error and is the difference between the mean value of the large number of repeated measurements and the true value.
2. Precision is the random error and is usually expressed as the standard deviation (within and between batch) of the spread of results about the mean.
3. Limit of detection is either:
 - three times the relative within batch standard deviation of a natural sample containing a low concentration of the parameter,
 - or
 - five times the relative within batch standard deviation of a blank sample.
4. The method should determine total cyanide in all forms.
5. Oxidation should be carried out for 10 minutes at 100 °C (212°F) under acid conditions using permanganate.
6. The performance characteristics apply to each individual pesticide and will depend on the pesticide concerned. The limit of detection may not be achievable for all pesticides at present, but it should strive to achieve this standard.
7. The performance characteristics apply to the individual substances specified at 25 % of the MCL in Table 3.6.
8. The performance characteristics apply to the individual substances specified at 50 % of the MCL in Table 3.6.

Table 3.27. Italian Analytical Test Methods

Parameter	Method	ISS ^{1,2} Analytical Method Code
Acrylamide	Quantitative determination, or Mass spectrometry Liquid chromatography	ISS XAA 001 rev.00 ISS CBA 001 rev.00
Aluminum	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 018 rev.00 ISS DBA 035 rev.00
Ammonium	Spectrophotometric	ISS BHE 019 rev.00
Antimony	Atomic absorption spectroscopy or Inductively Coupled Plasma - Hydrides	ISS DAA 002 rev.00 ISS DBB 034 rev.00
Arsenic	Atomic absorption spectroscopy, or Inductively Coupled Plasma - Hydrides	ISS DAA 003 rev.00 ISS DBB 034 rev.00
Barium	Atomic absorption spectroscopy	ISS DAA 046 rev.00
Benzo(a)pyrene	Gas chromatography / Mass spectrometry and Gas Chromatography/Flame ionization detector	ISS CAB 039 rev.00
Benzene	Gas chromatography (headspace static), or Gas Chromatography (Headspace dynamic)	ISS CAA 004 rev.00 ISS CAD 004 rev.00
Boron	Spectrophotometry (curnumin), or Spectrometry (azomethin), or Inductively Coupled Plasma	ISS BHA 005 rev.00 ISS BHB 005 rev.00 ISS DBA 035 rev.00
Bromate	Ion exchange chromatography	ISS CBB 006 rev.00
Cadmium	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 007 rev.00 ISS DBA 035 rev.00
Chloride	Argentometry, or Ion exchange chromatography	ISS BEA 020 rev.00 ISS CBB 037 rev.00
Chlorite	Ion exchange chromatography	ISS CBB 037 rev.00
Chromium	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 008 rev.00 ISS DBA 035 rev.00
Cobalt	Atomic absorption spectroscopy	ISS DAA 048 rev.00
Color	Photometric method (Platinum- Cobalt)	ISS BJA 021 rev.00
Conductivity	Conductometry	ISS BDA 022 rev.00
Copper	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 009 rev.00 ISS DBA 035 rev.00
Cyanide	Spectrophotometry	ISS BHC 010 rev.00
Cyanotoxins (microcystins)	Immunoassay, or Liquid chromatography/ Mass spectrometry	ISS BGA 044 rev.00 ISS CBA 044 rev.00

Parameter	Method	ISS ^{1,2} Analytical Method Code
1,2 dichloroethane	Gas chromatography (head space)	ISS CAA 036 rev.00
Epichlorohydrin	Quantitative determination	ISS XAA 011 rev.00
Dry residue (180°C)	Gavimetric	ISS BFA 032 rev.00
Fluoride	Ion exchange chromatography	ISS CBB 037 rev.00
Hardness	Titrimetric (ethylenediaminetetraacetic acid)	ISS BEC 031 rev.00
Iron	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 024 rev.00 ISS DBA 035 rev.00
Lead	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 012 rev.00 ISS DBA 035 rev.00
Manganese	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 025 rev.00 ISS DBA 035 rev.00
Mercury	Atomic absorption spectrometry without flame (on cold steam)	ISS DAB 013 rev.00
Nickel	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 014 rev.00 ISS DBA 035 rev.00
NO ₃	Ion exchange chromatography	ISS CBB 037 rev.00
NO ₂	Ion exchange chromatography	ISS CBB 037 rev.00
Odor	Sensory technique	ISS BAA 026 rev.00
Oxidizability	Titrimetric analysis (permanganate)	ISS BEB 027 rev.00
Pesticides	Gas chromatography/Mass spectrometry (solid phase extraction)	ISS CAC 015 rev.00
pH	Potentiometric	ISS BCA 023 rev.00
Polycyclic aromatic hydrocarbons	Gas chromatography/Mass spectrometry and Gas Chromatography/Flame ionization detector	ISS CAB 039 rev.00
Residual chlorine	N,NDiethyl-p-phenylenediamine (DPD) colorimetric method	ISS BHD 033 rev.00
Selenium	Atomic absorption spectroscopy or Inductively Coupled Plasma - Hydrides	ISS DAA 016 rev.00 ISS DBB 034 rev.00
Silver	Atomic absorption spectroscopy	ISS DAA 045 rev.00
Sodium	Ion exchange chromatography, or Inductively Coupled Plasma	ISS CBB 038 rev.00
Sulfates	Ion exchange chromatography	ISS CBB 037 rev.00
Taste	Sensory technique	ISS BKA 028 rev.00-
Tetrachloroethene	Gas chromatography (headspace)	ISS CAA 036 rev.00
Trichloroethene	Gas chromatography (headspace)	ISS CAA 036 rev.00
Trialomethanes Total	Gas chromatography (headspace)	ISS CAA 036 rev.00
Total organic carbon	Instrumental method	ISS BIA 029 rev.00

Parameter	Method	ISS ^{1,2} Analytical Method Code
Turbidity	nephelometric (formazine)	ISS BLA 030 rev.00
Undissolved Solids	Gravimetric	ISS BFA 042 rev.00
Vanadium	Atomic absorption spectroscopy, or Inductively Coupled Plasma	ISS DAA 017 rev.00 ISS DBA 035 rev.00
Vinyl Chloride	Quantitative determination	ISS XAA 040 rev.00
Zinc	Atomic absorption spectroscopy	ISS DAA 049 rev.00

Notes:

- For additional details, see manual published by ISS (Istituto Superiore di Sanita – Health Institute) titled “Reference analytical methods for water intended for human consumption – Chemical Methods (07/31).” A Component can approve or delegate approval of different test methods than indicated above if the alternate test method will attain the same limits in terms of detection, accuracy, and precision.
- Procedures related to the analytical control of water destined for human consumption:
 - Collection and preservation of samples = Follow Code ISS PGA 901 rev.00
 - Quality Control = Follow Code ISS PGA 903 rev.00

Table 3.28. DoD-Approved Inorganic Chemical Analytical Test Methods

Parameter	Methodology ¹³	EPA	ASTM ³	SM ⁴ (18 th , 19 th ed.)	SM ⁴ (20 th ed.)	SM Online ²²	Other
Alkalinity	Titrimetric Electrometric titration		D1067-92, 02 B	2320 B	2320 B	2320 B-97 I-1030-85 ⁵	
Aluminum	Axially viewed inductively coupled plasma-atomic emission spectrometry (AVICP-AES) Atomic Absorption; Direct Atomic Absorption; Furnace Inductively Coupled Plasma (ICP)	200.5 Revision 4.2 ²		3111 D 3113B 3120 B		3113 -04, B-10	
Antimony	ICP-Mass Spectrometry Hydride-Atomic Absorption Atomic Absorption (Platform) Atomic Absorption (Furnace)	200.8 ² 200.9 ²	D-3697-92, 02	 3113 B		3113 B-99	
Arsenic ¹⁴	ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Furnace) Hydride Atomic Absorption	200.8 ² 200.9 ²	D-2972-03C D-1972-03B	3113 B 3114 B		3113 B-99 3114 B-97	
Asbestos	Transmission Electron Microscopy Transmission Electron Microscopy	100.1 ⁹ 100.2 ¹⁰					
Barium	ICP ICP-Mass Spectrometry Atomic Absorption (Direct) Atomic Absorption (Furnace)	200.7 ² 200.8 ²		3120 B 3111 D 3113 B	3120 B	3120 B-99 3111 D-99 3113 B-99	
Beryllium	ICP ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Furnace)	200.7 ² 200.8 ² 200.9 ²	D3645-97, 03B	3120 B 3113 B	3120 B	3120 B-99 3113 B-99	
Cadmium	ICP ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Furnace)	200.7 ² 200.8 ² 200.9 ²		3113 B		3113 B-99	
Calcium	EDTA Titrimetric Atomic Absorption (Direct Aspiration) Inductively-Coupled Plasma Ion Chromatography	 200.7 ²	D511-93, 03A D511-93, 03B D6919-03	3500-Ca D 3111 B 3120 B	3500-Ca B 3120 B	3500-Ca B- 97 3111 B-99 3120 B-99	
Chloride	Silver Nitrate Titration Ion Chromatography Potentiometric Titration		D 512-04 B, 12 B D4327-11	4500-Cl ⁻ B 4110 B 4500-Cl ⁻ D	4500-Cl ⁻ B 4110 B 4500-Cl ⁻ D		
Chromium	ICP ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Furnace)	200.7 ² 200.8 ² 200.9 ²		3120 B 3113 B	3120 B	3120 B-99 3113 B-99	

Parameter	Methodology ¹³	EPA	ASTM ³	SM ⁴ (18 th , 19 th ed.)	SM ⁴ (20 th ed.)	SM Online ²²	Other
Color	Visual Comparison			2120 B	2120 B	2120B-01	
Copper	Atomic Absorption (Furnace) Atomic Absorption (Direct Aspiration) ICP ICP - Mass Spectrometry Atomic Absorption (Platform)	 200.7 ² 200.8 ² 200.9 ²	D1688-95, 02 C D1688-95, 02 A	3113 B 3111 B 3120 B	 3120 B	3113 B-99 3111 B-99 3120 B-99	
Conductivity	Conductance		D1125-95A	2510 B	2510 B	2510 B-97	
Cyanide	Manual Distillation followed by: Spectrophotometric (Amenable) Spectrophotometric (Manual) Spectrophotometric (Semi-automated) Selective Electrode UV, Distillation, Spectrophotometric Micro Distillation, Flow Injection, Spectrophotometric Ligand Exchange and Amperometry ²¹	 335.4 ⁶	D2036-98A D2036-98B D2036-98A D6888-04	4500-CN-C 4500-CN-G 4500-CN-E 4500-CN-F	4500-CN-C 4500-CN-G 4500-CN-E 4500-CN-F	4500-CN-G-99 4500-CN-E-99 4500-CN-F-99	I-3300-85 ⁵ Kelada-01 ¹⁷ QuikChem 10-204-00-1-X ¹⁸ OIA-1677, DW ²⁰
Foaming Agents	Methylene Blue Active Substances (MBAS)			5540C	5540C	5540 C-00	
Fluoride	Ion Chromatography Manual Distill (Color SPADNS) Manual Electrode Automated Electrode Automated Alizarin Capillary Ion Electrophoresis	300.0 ⁶ 300.1 ¹⁹	D4327-97, 03 D1179-93, 99 B	4110 B 4500-F-B, D 4500-F-C 4500-F-E	4110 B 4500-F-B, D 4500-F-C 4500-F-E	4110B-00 4500F-B-D-97 4500-F-C-97 4500-F-E-97	 380-75WE ¹¹ 129-71W ¹¹ D6508, Rev. 2 ²³
Iron	AVICP-AES Atomic Absorption (Direct) Atomic Absorption (Furnace) ICP	200.5, Revision 4.2 ²		 3111 B 3111 B 3120 B	 3111 B 3111 B 3120 B	 3111 B-04, B-10	

Parameter	Methodology ¹³	EPA	ASTM ³	SM ⁴ (18 th , 19 th ed.)	SM ⁴ (20 th ed.)	SM Online ²²	Other
Lead	Atomic Absorption (Furnace) ICP-Mass Spectrometry Atomic Absorption (Platform) Differential Pulse Anodic Stripping Voltammetry	200.8 ² 200.9 ²	D3559-96, 03 D	3113 B		3113 B-99	Method 1001 ¹⁶
Magnesium	Atomic Absorption ICP Complexation Titrimetric Methods Ion Chromatography	200.7 ²	D 511-93, 03 B D 511-93, 03 A D6919-03	3111 B 3120 B 3500-Mg E	3120 B 3500-Mg B	3111 B-99 3120 B-99 3500-Mg- B-97	
Manganese	AVICP-AES Atomic Absorption (Direct) Atomic Absorption (Furnace) ICP	200.5, Revision 4.2 ²		3111 B 3111 B 3120 B	3111 B 3111 B 3120 B	3111 B-04, B-10	
Mercury	Manual (Cold Vapor) Automated (Cold Vapor) ICP-Mass Spectrometry	245.1 ² 245.2 ¹ 200.8 ²	D3223-97, 02	3112 B		3112 B-99	
Nickel	ICP ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Direct) Atomic Absorption (Furnace)	200.7 ² 200.8 ² 200.9 ²		3120 B 3111 B 3113 B	3120 B	3120 B-99 3111 B-99 3113 B-99	
Nitrate	Ion Chromatography Automated Cadmium Reduction Ion Selective Electrode Manual Cadmium Reduction Capillary Ion Electrophoresis	300.0 ⁶ 300.1 ¹⁹ 353.2 ⁶	D4327-97, 03 D3867-90A D3867-90B D6508-00	4110 B 4500-NO ₃ ⁻ F 4500-NO ₃ ⁻ D 4500-NO ₃ ⁻ E	4110 B 4500-NO ₃ ⁻ F 4500-NO ₃ ⁻ D 4500-NO ₃ ⁻ E	4110 B-00 4500-NO ₃ ⁻ F-00 4500-NO ₃ ⁻ D-00 4500-NO ₃ ⁻ E-00	B-1011 ⁸ 601 ⁷
Nitrite	Ion Chromatography Automated Cadmium Reduction Manual Cadmium Reduction Spectrophotometric Capillary Ion Electrophoresis	300.0 ⁶ 300.1 ¹⁹ 353.2 ⁶	D4327-97, 03 D3867-90A D3867-90B D6508-00	4110 B 4500-NO ₃ ⁻ F 4500-NO ₃ ⁻ E 4500-NO ₂ ⁻ B	4110 B 4500-NO ₃ ⁻ F 4500-NO ₃ ⁻ E 4500-NO ₂ ⁻ B	4110 B-00 4500-NO ₃ ⁻ F-00 4500-NO ₃ ⁻ E-00 4500-NO ₂ ⁻ B-00	B-1011 ⁸
Odor	Threshold Odor Test			2150 B	2150 B	2150 B-97	
Orthophosphate	Colorimetric (Automated, Ascorbic Acid) Colorimetric (Ascorbic Acid, Single Reagent)	365.1 ⁶	D515-88A	4500-P F 4500-P E	4500-P F 4500-P E		

Parameter	Methodology ¹³	EPA	ASTM ³	SM ⁴ (18 th , 19 th ed.)	SM ⁴ (20 th ed.)	SM Online ²²	Other
	Colorimetric (Phosphomolybdate) Automated-Segmented Flow Automated Discrete Ion Chromatography Capillary Ion Electrophoresis	300.0 ⁶ 300.1 ¹⁹	D4327-97, 03 D6508-00	4110 B	4110 B	4110 B-00	I-1602-85 ₅ I-2601-90 ₅ I-2598-85 ₅
pH	Electrometric	150.1 ¹ 150.2 ²	D1293-95, 99	4500-H ⁺ B	4500-H ⁺ B	4500-H ⁺ B- 00	
Selenium	Hydride-Atomic Absorption ICP-Mass Spectrometry Atomic Absorption (Platform) Atomic Absorption (Furnace)	200.8 ² 200.9 ²	D3859-98, - 03A D3859-98, 03B	3114 B 3113 B		3114 B-97 3113 B-99	
Silica	Colorimetric, Molybdate Blue Automated-Segmented Flow Colorimetric Molybdosilicate Heteropoly blue Automated for Molybdate-reactive Silica ICP	200.7 ²	D859-94, 00	4500-Si D 4500-Si E 4500-Si F 3120 B	4500-SiO ₂ C 4500-SiO ₂ D 4500-SiO ₂ E 3120 B	4500-SiO ₂ C-97 4500-SiO ₂ D-97 4500-SiO ₂ E-97 3120 B-99	I-1700-85 ₅ I-2700-85 ₅
Silver	AVICP-AES Atomic Absorption (Direct) Atomic Absorption (Furnace) ICP	200.5, Revision 4.2 ²		3111 B 3111 B 3120 B	3111 B 3111 B 3120 B	3111 B-04, B-10	
Sodium	Inductively-Coupled Plasma Atomic Absorption (Direct Aspiration) Ion Chromatography	200.7 ²	D6919-03	3111 B		3111 B-99	
Sulfate	Ion Chromatography Gravimetric with ignition of residue Gravimetric with drying of residue		D4327-11	4110 B 4500-SO ₄ ²⁻ C 4500-SO ₄ ²⁻ D	4110 B 4500-SO ₄ ²⁻ C 4500-SO ₄ ²⁻ D	4500-SO ₄ ²⁻ C-97 4500-SO ₄ ²⁻ D-97	

Parameter	Methodology ¹³	EPA	ASTM ³	SM ⁴ (18 th , 19 th ed.)	SM ⁴ (20 th ed.)	SM Online ²²	Other
	Turbidimetric method		D 516-07, 11	4500-SO ₄ ²⁻ E	4500-SO ₄ ²⁻ E	4500-SO ₄ ²⁻ E-97	
	Automatic methylthymol blue method			4500-SO ₄ ²⁻ F	4500-SO ₄ ²⁻ F	4500-SO ₄ ²⁻ F-97	
Temperature	Thermometric			2550	2550	2550-00	
Thallium	ICP-Mass Spectrometry Atomic Absorption (Platform)	200.8 ² 200.9 ²					
Zinc	AVICP-AES	200.5, Revision 4.2 ²					
	Atomic Absorption (Direct Aspiration)			3111 B	3111 B		
	ICP			3120 B	3120 B		

Notes:

The procedures shall be done in accordance with the documents listed below. Copies of the documents may be obtained from the sources listed below. Information regarding obtaining these documents can be obtained from the Safe Drinking Water Hotline at 800-426-4791. Documents may be inspected at EPA's Drinking Water Docket, EPA West, 1301 Constitution Avenue, NW., Room 3334, Washington, DC 20460 (Telephone: 202-566-2426); or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to:

http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

1. "Methods for Chemical Analysis of Water and Wastes", EPA/600/4-79/020, March 1983. Available at NTIS, PB84- 128677.
2. "Methods for the Determination of Metals in Environmental Samples--Supplement I", EPA/600/R-94/111, May 1994. Available at NTIS, PB95-125472.
3. *Annual Book of ASTM Standards*, ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428, <http://www.astm.org>; *Annual Book of ASTM Standards 1994*, Vols. 11.01 and 11.02; *Annual Book of ASTM Standards 1996*, Vols. 11.01 and 11.02; *Annual Book of ASTM Standards 1999*, Vols. 11.01 and 11.02; *Annual Book of ASTM Standards 2003*, Vols. 11.01 and 11.02.
4. *Standard Methods for the Examination of Water and Wastewater*, American Public Health Association, 800 I Street NW., Washington, DC 20001-3710; *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992); *Standard Methods for the Examination of Water and Wastewater*, 19th edition (1995); *Standard Methods for the Examination of Water and Wastewater*, 20th edition (1998). The following methods from this edition cannot be used: 3111 B, 3111 D, 3113 B, and 3114 B.
5. U.S. Geological Survey, Federal Center, Box 25286, Denver, CO 80225-0425; *Methods for Analysis by the U.S. Geological Survey National Water Quality Laboratory—Determination of Inorganic and Organic Constituents in Water and Fluvial Sediment*, Open File Report 93-125, 1993; *Techniques of Water Resources Investigation of the U.S. Geological Survey*, Book 5, Chapter A-1, 3rd edition, 1989.
6. "Methods for the Determination of Inorganic Substances in Environmental Samples," EPA/600/R-93/100, August 1993. Available at NTIS, PB94-120821.
7. The procedure shall be done in accordance with the Technical Bulletin 601 "Standard Method of Test for Nitrate in Drinking Water," July 1994, PN 221890-001, Analytical Technology, Inc. Copies may be obtained from ATI Orion, 529 Main Street, Boston, MA 02129.
8. Method B-1011, "Waters Test Method for Determination of Nitrite/Nitrate in Water Using Single Column Ion Chromatography," August 1987. Copies may be obtained from Waters Corporation, Technical Services Division, 34 Maple Street, Milford, MA 01757.

9. Method 100.1, "Analytical Method For Determination of Asbestos Fibers in Water," EPA/600/4-83/043, EPA, September 1983. Available at NTIS, PB83-260471.
10. Method 100.2, "Determination of Asbestos Structure Over 10- μ m In Length In Drinking Water," EPA/600/R-94/134, June 1994. Available at NTIS, PB94-201902.
11. Industrial Method No. 129-71W, "Fluoride in Water and Wastewater," December 1972, and Method No. 380-75WE, "Fluoride in Water and Wastewater," February 1976, Technicon Industrial Systems. Copies may be obtained from Bran & Luebbe, 1025 Busch Parkway, Buffalo Grove, IL 60089.
12. Unfiltered, no digestion or hydrolysis.
13. Because MDLs reported in EPA Methods 200.7 and 200.9 were determined using a 2X preconcentration step during sample digestion, MDLs determined when samples are analyzed by direct analysis (i.e., no sample digestion) will be higher. For direct analysis of cadmium and arsenic by Method 200.7, and arsenic by Method 3120 B sample preconcentration using pneumatic nebulization may be required to achieve lower detection limits. Preconcentration may also be required for direct analysis of antimony, lead, and thallium by Method 200.9; antimony and lead by Method 3113 B; and lead by Method D3559-90D unless multiple in-furnace depositions are made.
14. If ultrasonic nebulization is used in the determination of arsenic by Method 200.8, the arsenic must be in the pentavalent state to provide uniform signal response. For direct analysis of arsenic with Method 200.8 using ultrasonic nebulization, samples and standards must contain 1 mg/L of sodium hypochlorite.
15. [Reserved]
16. The description for Method Number 1001 for lead is available from Palintest, LTD, 21 Kenton Lands Road, P.O. Box 18395, Erlanger, KY 41018. Or from the Hach Company, P.O. Box 389, Loveland, CO 80539.
17. The description for the Kelada-01 Method, "Kelada Automated Test Methods for Total Cyanide, Acid Dissociable Cyanide, And Thiocyanate," Revision 1.2, August 2001, EPA # 821-B-01-009 for cyanide is available from the National Technical Information Service (NTIS), PB 2001-108275, 5285 Port Royal Road, Springfield, VA 22161. The toll free telephone number is 800-553-6847. **Note:** A 450-W UV lamp may be used in this method instead of the 550-W lamp specified if it provides performance within the quality control (QC) acceptance criteria of the method in a given instrument. Similarly, modified flow cell configurations and flow conditions may be used in the method, provided that the QC acceptance criteria are met.
18. The description for the QuikChem Method 10-204-00-1-X, "Digestion and distillation of total cyanide in drinking and wastewaters using MICRO DIST and determination of cyanide by flow injection analysis," Revision 2.1, November 30, 2000, for cyanide is available from Lachat Instruments, 6645 W. Mill Rd., Milwaukee, WI 53218. Telephone: 414-358-4200.
19. "Methods for the Determination of Organic and Inorganic Compounds in Drinking Water," Vol. 1, EPA 815-R-00-014, August 2000. Available as Technical Report PB2000-106981 at National Technical Information Service (NTIS), 5301 Shawnee Road, Alexandria, VA 22312. <http://www.ntis.gov>.
20. Method OIA-1677, DW "Available Cyanide by Flow Injection, Ligand Exchange, and Amperometry," January 2004. EPA-821-R-04-001, Available from ALPKEM, A Division of OI Analytical, P.O. Box 9010, College Station, TX 77842-9010.
21. Sulfide levels below those detected using lead acetate paper may produce positive method interferences. Test samples using a more sensitive sulfide method to determine if a sulfide interference is present, and treat samples accordingly.
22. Standard Methods Online, American Public Health Association, 800 I Street NW., Washington, DC 20001, available at <http://www.standardmethods.org>. The year in which each method was approved by the Standard Methods Committee is designated by the last two digits in the method number. The methods listed are the only online versions that may be used.

Table 3.29. DoD-Approved Organic Chemicals Analytical Test Methods

Parameter	Method			
	EPA	Standard	ASTM	Other
Alachlor ²	507, 525.2, 508.1, 505, 551.1			
Atrazine ²	507, 525.2, 508.1, 505, 551.1			Syngenta ⁵ AG-625
Benzene	502.2, 524.2			
Benzo[a]pyrene	525.2, 550, 550.1			
Carbofuran	531.1, 531.2	6610		
Carbon tetrachloride (Tetrachloromethane)	502.2, 524.2, 551.1			
Chlordane	508, 525.2, 508.1, 505			
Monochlorobenzene (Chlorobenzene)	502.2, 524.2			
2,4-D ⁴ (as acid, salts and esters)	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98	
Dalapon	552.1, 515.1, 552.2, 515.3, 515.4, 552.3			
Dibromochloropropane (DBCP)	504.1, 551.1			
o-Dichlorobenzene (1,2-Dichlorobenzene)	502.2, 524.2			
p-Dichlorobenzene (1,4-Dichlorobenzene)	502.2, 524.2			
1,2-Dichloroethane	502.2, 524.2			
1,1-Dichloroethylene (1,1-Dichloroethene)	502.2, 524.2			
cis-Dichloroethylene (cis-1,2-Dichloroethene)	502.2, 524.2			
trans-Dichloroethylene (trans-1,2-Dichloroethene)	502.2, 524.2			
Dichloromethane	502.2, 524.2			
1,2-Dichloropropane	502.2, 524.2			
Di(2-ethylhexyl)adipate	506, 525.2			
Di(2-ethylhexyl)phthalate	506, 525.2			
Dinoseb ⁴	515.2, 555, 515.1, 515.3, 515.4			
Dioxin (2,3,7,8-TCDD)	1613			
Diquat	549.2			
Endothall	548.1			
Endrin	508, 525.2, 508.1, 505, 551.1			
Ethylbenzene	502.2, 524.2			
Ethylene dibromide (EDB) (1,2-Dibromoethane)	504.1, 551.1			
Glyphosate	547	6651		
Heptachlor	508, 525.2, 508.1, 505, 551.1			
Heptachlor Epoxide	508, 525.2, 508.1, 505, 551.1			
Hexachlorobenzene	508, 525.2, 508.1, 505, 551.1			
Hexachlorocyclopentadiene	508, 525.2, 508.1, 505,			

Parameter	Method			
	EPA	Standard	ASTM	Other
	551.1			
Lindane	508, 525.2, 508.1, 505, 551.1			
Methoxychlor	508, 525.2, 508.1, 505, 551.1			
Oxamyl	531.1, 531.2	6610		
PCBs ³ (as decachlorobiphenyl) (as Aroclors)	508A 508.1, 508, 525.2, 505			
Pentachlorophenol	515.2, 525.2, 555, 515.1, 515.3, 515.4		D5317-93, 98	
Picloram ⁴	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98	
Silvex (2,4,5-TP ⁴)	515.2, 555, 515.1, 515.3, 515.4		D5317-93, 98	
Simazine ²	507, 525.2, 508.1, 505, 551.1			
Styrene	502.2, 524.2			
Tetrachloroethylene (Tetrachloroethene)	502.2, 524.2, 551.1			
Toluene	502.2, 524.2			
Total Trihalomethanes	502.2, 524.2, 551.1			
Toxaphene	508, 508.1, 525.2, 505			
1,2,4-Trichlorobenzene	502.2, 524.2			
1,1,1-Trichloroethane	502.2, 524.2, 551.1			
1,1,2-Trichloroethane	502.2, 524.2, 551.1			
Trichloroethylene (Trichloroethene)	502.2, 524.2, 551.1			
Vinyl chloride	502.2, 524.2			
Xylenes (total)	502.2, 524.2			

Notes:

1. [Reserved]
2. Substitution of the detector specified in Method 505, 507, 508 or 508.1 for the purpose of achieving lower detection limits is allowed as follows. Either an electron capture or nitrogen phosphorous detector may be used provided all regulatory requirements and quality control criteria are met.
3. PCBs are qualitatively identified as Aroclors and measured for compliance purposes as decachlorobiphenyl. Users of Method 505 may have more difficulty in achieving the required detection limits than users of Methods 508.1, 525.2 or 508.
4. Accurate determination of the chlorinated esters requires hydrolysis of the sample as described in EPA Methods 515.1, 515.2, 515.3 and 555, and ASTM Method D 5317-93.
5. This method may not be used for the analysis of atrazine in any system where chlorine dioxide is used for drinking water treatment. In samples from all other systems, any result for atrazine generated by Method AG-625 that is > one-half the maximum contaminant level (MCL) (in other words, > 0.0015mg/L or 1.5 µg/L) must be confirmed using another approved method for this contaminant and should use additional volume of the original sample collected for compliance monitoring. In instances where a result from Method AG-625 triggers such confirmatory testing, the confirmatory result is to be used to determine compliance.

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C4. CHAPTER 4

WASTEWATER

C4.1. SCOPE

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

C4.2. DEFINITIONS

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

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

C4.2.3. Annual Average. The arithmetic mean of values for each parameter of samples collected during 1 year.

C4.2.4. 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.

C4.2.5. 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.

C4.2.6. Best Management Practices (BMPs). Practical practices and procedures that will minimize or eliminate the possibility of pollution being introduced into waters of Italy.

C4.2.7. Biochemical Oxygen Demand (BOD₅). The 5-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).

C4.2.8. Carbonaceous BOD₅ (CBOD₅). The 5-day measure of the pollutant parameter, CBOD₅. This test can substitute for the BOD₅ testing which suppresses the nitrification reaction/component in the BOD₅ test.

C4.2.9. Chemical Oxygen Demand (COD). The mass of oxygen consumed for the complete oxidation of organic and inorganic compounds contained in one liter of solution.

C4.2.10. Daily Average. The arithmetic mean of values calculated for each parameter on samples collected during a 24-hour period.

C4.2.11. 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.

C4.2.12. Discharge. Any flow through a continuous fixed conveyance system, which connects the process generating the wastewater flow to the receptor (surface waters, soil, subsoil, or into a sewer system), regardless of its pollutant composition and whether previously treated.

The following sources of "water releases" are not included in the definition of "discharge":

C4.2.12.1. Hydroelectric power plants;

C4.2.12.2. Irrigation;

C4.2.12.3. Drinking water purifying plants; and

C4.2.12.4. Drilling activities not including those for hydrocarbon exploration.

C4.2.13. Discharge onto Soil. Any discharge onto soil or shallow subsoil.

C4.2.14. Discharge of a Pollutant. The addition of any pollutant or combination of pollutants to waters of Italy from any "point source."

C4.2.15. Distribution Network. Facilities destined to the conveyance of reclaimed wastewater, including any equalization equipment or storage of reclaimed wastewater different from those mentioned above.

C4.2.16. Domestic Wastewater. Wastewater originating from residential establishments and consisting primarily of refuse from human metabolism and domestic activities.

C4.2.17. Domestic Wastewater Treatment System (DWTS). Any DoD or Italian facility designed to treat wastewater before its discharge to waters of Italy and in which the majority of such wastewater is made up of domestic sewage.

C4.2.18. Effluent Limitation. Any restriction imposed on characteristics of wastewater that are ultimately discharged.

C4.2.19. Existing Discharge. Authorized wastewater discharges (urban, domestic, and industrial) operational prior to 1 October 1994.

C4.2.20. Industrial Activities Associated with Storm Water. Activities that may contribute pollutants to storm water runoff or drainage during wet weather events (see Table 4.5, “Best Management Practices.”)

C4.2.21. Industrial Wastewater. Any type of wastewater, other than domestic wastewater and storm water, discharged from buildings or facilities where commercial or industrial activities take place.

C4.2.22. Inhabitant Equivalent (IE). A unit of measure indicating the biodegradable organic load having a BOD₅ (5-day biochemical oxygen demand) equal to 60 grams (21 ounces) of O₂ per day. The capacity of a wastewater treatment system is expressed in IE. This value should not be substituted for the number of people served by the wastewater treatment system.

C4.2.23. 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.

C4.2.24. Maximum Daily Discharge Limitation. The highest allowable daily discharge based on volume as well as concentration.

C4.2.25. 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.

C4.2.26. 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.

C4.2.27. Process Wastewater. Industrial wastewater 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.

C4.2.28. Reclaim. Treatment of wastewater for reuse.

C4.2.29. Regulated Facilities. Those facilities for which criteria are established under this Chapter, such as treatment systems for domestic, industrial, and urban wastewaters.

C4.2.30. Reuse. The use of reclaimed wastewater instead of abstracted surface/or groundwater (partially or totally). Reclaimed wastewater has to meet specific quality standards and to be supplied through a distribution network.

C4.2.31. Sensitive Areas. Include the following water systems:

C4.2.31.1. Natural lakes, fresh waters, estuaries, and coastal waters, eutrophic or subject to future eutrophication, in the absence of specific protective actions;

C4.2.31.2. Fresh surface waters intended to produce drinking water that may contain nitrates at a concentration exceeding 50 mg/L (as NO₃) in the absence of corrective actions;

C4.2.31.3. Areas where discharges require supplementary treatment;

C4.2.31.4. Lakes located at an elevation of < 1,000 m (3,281 ft) above sea level (asl) and with a surface area of $\geq 0.3 \text{ km}^2$ (74.1 acres); and

C4.2.31.5. Water bodies where traditional fish production activities are conducted.

C4.2.32. Separated Sewer Systems. A sewer system with two conduits, one conduit for conveying storm water and the other conduit for conveying wastewater.

C4.2.33. Septic Systems. An on-site system designed to treat and dispose of domestic sewage. A septic system consists of a septic tank that receives the waste and allows the solids to settle and an underground drainage field that allows the liquid to be absorbed by the soil.

C4.2.34. Sewer System. A conduit system for the collection and conveyance of Urban Wastewater.

C4.2.35. Storm Water. Runoff and drainage from wet weather events such as rain, snow, ice, sleet, or hail.

C4.2.36. Substantial Modification. Any modification to a facility, the cost of which exceeds \$1,000,000, regardless of funding source.

C4.2.37. Total Suspended Solids (TSS). The pollutant parameter total filterable suspended solids.

C4.2.38. Total Toxic Organics (TTO). The summation of all quantifiable values > 0.01 mg/L for the toxic organics in Table 4.4, "Components of Total Toxic Organics."

C4.2.39. Urban Conglomerate. Areas where the population or economic activities are sufficiently concentrated to allow the collection and conveyance of urban wastewater to a treatment system or a final discharge point, when technically and economically feasible considering the resulting improvements to the environment.

C4.2.40. Urban Wastewater. Domestic wastewater or the mixing of domestic wastewater, industrial wastewater, or storm water runoff, conveyed to a sewer system (including separated systems) and originating from an urban conglomerate.

C4.2.41. Wastewater Reclaiming Treatment System. The system for the reclaiming of wastewater, including any equalization equipment or storage of recovered wastewater located near the treatment system before the inlet in the distribution network.

C4.2.42. Waters of Italy. Surface waters including the territorial seas (12 nm) recognized under customary international law, including:

C4.2.42.1. All waters which are currently used, were used in the past, or may be susceptible to use in commerce;

C4.2.42.2. Waters which are or could be used for recreation or other purposes;

C4.2.42.3. Waters from which fish or shellfish are or could be taken and sold;

C4.2.42.4. Waters which are used or could be used for industrial purposes by industries;

C4.2.42.5. Waters including lakes, rivers, streams (including intermittent streams), sloughs, prairie potholes, or natural ponds; and

C4.2.42.6. Tributaries of waters identified above.

C4.2.42.7. Waters of Italy also includes groundwater.

C4.2.42.8. Exclusions to waters of Italy. Domestic or industrial waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of this Chapter, are not waters of Italy. This exclusion applies only to manmade bodies of water that were neither originally waters of Italy nor resulted from impoundment of waters of Italy.

C4.3. CRITERIA

C4.3.1. Effluent Limitations for Discharges of Pollutants

C4.3.1.1. All new and existing sources of pollutants that discharge into surface waters or Italian sewer systems shall be authorized (see Chapter 1 for the process) and shall comply with the effluent limitations of Table 4.1.

C4.3.1.1.1. Urban wastewater treatment systems shall comply with a daily average. In addition, urban wastewater containing industrial wastewater shall comply with composite three-hour averages.

C4.3.1.1.2. In addition, in the Veneto Region all new and existing urban wastewater discharges into surface water shall comply with the effluent limitations of Table 4.1.1.

C4.3.1.1.3. The following requirements apply to domestic wastewater in the Veneto Region:

C4.3.1.1.3.1. Domestic wastewater from isolated buildings or facilities not conveyed to the public sewer system and associated with a number of inhabitant equivalents (IE) lower than 50: buildings and facilities shall be provided with an Imhoff tank and a dispersion system into the soil. The discharge authorization may be included in the building authorization.

C4.3.1.1.3.2. Domestic wastewater from conglomerates associated with a number of inhabitant equivalents (IE) ≥ 50 IE and lower than threshold values of IE listed in Table 4.1.1-b: these areas shall be provided with Imhoff tanks, possibly followed by natural treatment technologies (such as lagooning or phytotreatment) or other systems having equivalent or better performances. In the case of discharge onto soil or surface waters, the treatment system shall ensure a 50% reduction of TSS and a 25% reduction of BOD₅ and COD.

C4.3.1.1.4. The following requirements apply to domestic and urban wastewater in the Tuscany Region:

C4.3.1.1.4.1. Domestic wastewater from isolated buildings or facilities associated to a number of inhabitant equivalents (IE) lower than 100 and discharging to soil: the buildings and facilities shall be provided with a septic tank (two-stage, three-stage or Imhoff tank) and a dispersion system into the soil.

C4.3.1.1.4.2. Domestic or urban wastewater from conglomerates discharging to surface water and associated with a number of inhabitant equivalents (IE) lower than 2,000: these areas shall be provided with a treatment system refer to Table 4.1.2-a if discharging to fresh waters or in Table 4.1.2-b if discharging to sea-water.

C4.3.1.2. All new sources of urban wastewater not regulated under C4.3.1.1 and C4.3.1.1.1 and directly discharged to waters of Italy will comply with the following effluent limitations:

C4.3.1.2.1. BOD₅

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

C4.3.1.2.1.2. The 7-day average will not exceed 45 mg/L.

C4.3.1.2.1.3. CBOD₅ may be substituted for BOD₅. CBOD₅ limit, if substituted for the parameter BOD₅, should be ≥ 5 mg/L less than each numerical limit for the 30-day and 7-day average for the BOD₅ limit. The CBOD₅ test procedure suppresses the nitrification component in the BOD₅ test procedure, thereby reducing the value or effects and lowering the oxygen demand. When CBOD₅ is substituted for BOD₅, the following limits will apply:

C4.3.1.2.1.3.1 30-day average will not exceed 25 mg/L.

C4.3.1.2.1.3.2 The 7-day average will not exceed 40 mg/L.

C4.3.1.2.2. TSS

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

C4.3.1.2.2.2. The 7-day average will not exceed 45 mg/L.

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

C4.3.1.3. Existing sources of urban wastewater not regulated under C4.3.1.1 and C4.3.1.1.1 to waters of Italy will comply with the following effluent limitations:

C4.3.1.3.1. BOD₅

C4.3.1.3.1.1. The 30-day average will not exceed 45 mg/L.

C4.3.1.3.1.2. The 7-day average will not exceed 65 mg/L.

C4.3.1.3.2. TSS

C4.3.1.3.2.1. The 30-day average will not exceed 45 mg/L.

C4.3.1.3.2.2. The 7-day average will not exceed 65 mg/L.

C4.3.1.3.2.3. The effluent pH values will be maintained between 6.0 and 9.0.

C4.3.1.4. Sewer Systems. The following requirements apply to urban conglomerates:

C4.3.1.4.1. Urban conglomerates with a number of inhabitant equivalents (IE) $\geq$ 2,000 shall be provided with a sewer system for the collection of urban wastewater.

C4.3.1.4.1.1. In addition, in the Veneto Region urban conglomerates with a number of inhabitant equivalents (IE) $<$ 2,000 shall be provided with a sewer system for the collection of urban wastewater by the end of 2014, unless the cost-benefit analysis is disadvantageous or the construction is not technically feasible due to geomorphologic characteristics of the area.

C4.3.1.5. DoD-owned or operated wastewater treatment systems with a capacity $>$ 2,000 inhabitant equivalents (IE) shall be equipped with a disinfection system, unless using natural treatment technologies (such as lagooning or phytoremediation).

C4.3.1.5.1. The use of chlorine gas or hypochlorite in the disinfection systems of urban wastewater treatment plants in the Veneto Region is prohibited beginning 8 December 2012.

C4.3.1.6. Discharge of any wastewater directly onto soils, and shallow subsoil is prohibited with the exception of the following:

C4.3.1.6.1. Isolated residential areas or sites where connection to a sewer system is not feasible because of excessive costs and would not result in an increased protection of the environment (e.g., septic systems).

C4.3.1.6.2. Overflow pipes serving sewer systems.

C4.3.1.6.3. Urban or industrial wastewater discharges that are not technically or economically feasible to convey to surface water bodies, if such discharges respect the criteria and effluent limits listed in Table 4.1 sixth column (“Discharge to soil”).

C4.3.1.6.4. Wastewater discharges resulting from the processing of natural rocks or mineral washing if the discharge consists only of water and natural inert material and does not impact the groundwater or create soil erosion or risk of landslides.

C4.3.1.6.5. Storm water discharges conveyed through a separate sewer system.

C4.3.1.6.6. Waters discharged as a result of water tank overflow, maintenance activities of the drinking water system, and maintenance of water system wells.

C4.3.1.6.7. Notwithstanding the exceptions identified above, in cases of discharges of urban and industrial wastewater, the distance to the closest surface water body shall be > the following:

C4.3.1.6.7.1. Urban wastewater:

C4.3.1.6.7.1.1 1,000 m (3,281 ft) for daily average discharge < 500 m³ (17,657 ft³);

C4.3.1.6.7.1.2 2,500 m (8,202 ft) for daily average discharge 501 to 5,000 m³ (17,692 ft³ to 176,573 ft³); and

C4.3.1.6.7.1.3 5,000 m (16,404 ft) for daily average discharge 5,001 to 10,000 m³ (176,609 ft³ to 353,147 ft³).

C4.3.1.6.7.2. Industrial wastewater:

C4.3.1.6.7.2.1 1,000 m (3,281 ft) for daily average discharge < 100 m³ (3,531 ft³);

C4.3.1.6.7.2.2 2,500 m (8,202 ft) for daily average discharge 101 to 500 m³ (3,567 ft³ to 17,657 ft³); and

C4.3.1.6.7.2.3 5,000 m (16,404 ft) for daily average discharge 501 to 2,000 m³ (17,692 ft³ to 70,629 ft³).

C4.3.1.6.7.3. Urban and industrial discharges with a daily average volume > 10,000 m³ and 2,000 m³ (353,147 ft³ and 70,629 ft³) respectively shall be conveyed to a surface water body or sewer system, or shall be recycled.

C4.3.1.6.7.4. Notwithstanding the exceptions identified above, those allowable discharges of urban and industrial wastewater to soil shall be conducted in accordance with a discharge authorization and shall meet the limits specified in Table 4.1 sixth column (“Discharge to soil”) (or in the discharge authorization, if more protective).

C4.3.1.6.7.4.1 In addition, in the Veneto Region discharge onto soil of domestic wastewater from conglomerates associated with a number of inhabitant equivalents (IE) ≥ 50 IE and lower than threshold values of IE listed in Table 4.1.1-b is allowed only if the distance to the closest surface water body is $> 1,000$ m (3,281 ft).

C4.3.1.7. Discharge of any wastewater directly into the subsurface or groundwater is prohibited with the exception of the following:

C4.3.1.7.1. Water used in geothermal exploration;

C4.3.1.7.2. Water generated during hydrocarbon exploration;

C4.3.1.7.3. Infiltration water in mines and quarries;

C4.3.1.7.4. Water used for the washing and working activities on aggregates;

C4.3.1.7.5. Water pumped during engineering projects, including thermal exchange systems; and

C4.3.1.7.6. Other exceptions for the discharge at sea of water generated during hydrocarbon explorations (limit of 40 mg/L of total petroleum hydrocarbons (TPH)).

C4.3.1.8. Discharge onto soil or shallow subsoil of the following substances is prohibited:

C4.3.1.8.1. Organic-halogenated compounds and substances which may give origin to such compounds in water;

C4.3.1.8.2. Organic-phosphoric compounds;

C4.3.1.8.3. Organic-stannous compounds;

C4.3.1.8.4. Substances with carcinogenic, mutagenic or teratogenic properties in water;

C4.3.1.8.5. Mercury and its compounds;

C4.3.1.8.6. Cadmium and its compounds;

C4.3.1.8.7. Persistent mineral oils and hydrocarbons;

C4.3.1.8.8. Cyanides; and

C4.3.1.8.9. Persistent materials able to float, to remain suspended, or to sink and that may disturb any type of use of waters.

C4.3.1.9. The discharge directly to groundwater of the following additional substances is also prohibited:

C4.3.1.9.1. Antimony, arsenic, barium, beryllium, boron, chromium, cobalt, copper, lead, molybdenum, nickel, selenium, silver, tellurium, thallium, tin, titanium, uranium, vanadium, or zinc;

C4.3.1.9.2. Biocides and their derivatives not previously listed;

C4.3.1.9.3. Substances that have noxious effects on the taste or odor of products for human consumption derived from the water environment, as well as any compound that may give origin to such substances in water;

C4.3.1.9.4. Toxic or persistent organosilicate compounds and that may give origin to such compounds in water, except for substances that are biologically non-harmful or that quickly become non-harmful in water;

C4.3.1.9.5. Inorganic compounds of phosphorous;

C4.3.1.9.6. Non-persistent mineral oils and hydrocarbons;

C4.3.1.9.7. Cyanides and fluorides; and

C4.3.1.9.8. Substances that negatively affect the oxygen equilibrium, in particular, ammonia and nitrites.

C4.3.1.10. Veneto Region. Discharge to soil of the following substances is additionally prohibited in the Veneto Region:

C4.3.1.10.1. Organohalogenated compounds;

C4.3.1.10.2. Organophosphorus compounds;

C4.3.1.10.3. Organostannic compounds;

C4.3.1.10.4. Phosphorous pesticides;

C4.3.1.10.5. Substance and mixtures, including relevant decomposition products, demonstrated to be carcinogenic, mutagen, teratogen or that can have effects on endocrine functions;

C4.3.1.10.6. Mineral and persistent oils;

C4.3.1.10.7. Mercury, cadmium, cyanides, chromium VI and their compounds;
and

C4.3.1.10.8. These substances are considered absent when they are not detected at concentrations above their analytical method detection limit.

C4.3.1.11. Wastewater Monitoring. Monitoring requirements apply to all regulated facilities. The monitoring frequency (including both sampling and analysis) is provided in Table

4.2-b for BOD₅, TSS, and pH, and in Table 4.2-a for COD, Total Phosphorus (if discharged to sensitive areas), and Total Nitrogen (if discharged to sensitive areas).

C4.3.1.12. Effluent samples shall be collected immediately prior to the point of discharge (e.g., within the discharge pipe, just before the effluent is discharged to the receiving water body) or to the public sewer system. Influent samples shall be collected at a point immediately upgradient of the wastewater treatment system. The number of nonconforming samples allowed for BOD₅, COD, and TSS for urban wastewater is given in Table 4.3.

C4.3.1.13. Recordkeeping Requirements. The following monitoring and record-keeping requirements are BMPs and apply to all facilities. Retain records for three years.

C4.3.1.13.1. The effluent, concentration, or other measurement specified for each regulated parameter.

C4.3.1.13.2. The daily volume of effluent discharge from each point source.

C4.3.1.13.2.1. In addition, treatment plants in the Tuscany Region with plant capacity > 100 IE for industrial wastewater discharges or 2000 IE in case of urban wastewater require a flow meter that continuously records the outflow rate.

C4.3.1.13.3. Test procedures for the analysis of pollutants.

C4.3.1.13.4. The date, exact place, and time of sampling and/or measurements.

C4.3.1.13.5. The name of the person who performed the sampling and/or measurements.

C4.3.1.13.6. The date of analysis.

C4.3.2. Effluent Limitations For Non-Categorical Industrial Discharges

C4.3.2.1. Effluent Limits. The following effluent limits will apply to all discharges of pollutants to wastewater treatment plants and associated collection systems from process wastewater for which categorical standards have not been established (see subparagraphs C4.3.3.1.8., C4.3.3.1.9., C4.3.3.1.10., and C4.3.3.1.11 for a list of categorical standards).

C4.3.2.2. The discharge to a DoD-operated wastewater treatment plant or a municipal sewer system of any type of waste (solid, liquid, or gaseous) classified as such based on the criteria established in Chapter 6, “Hazardous Waste” or Chapter 7, “Solid Waste,” except wastewater, is prohibited, even if the waste has been passed through a grinder. The only exception is made for organic food wastes treated by means of a food waste disposal grinder, under the condition that the manager of the public sewer implements a wastewater treatment system.

C4.3.2.2.1. 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.

C4.3.2.2.2. Ignitability and Explosivity

C4.3.2.2.2.1. The discharge of wastewater with a closed cup flashpoint of $< 60^{\circ}\text{C}$ (140°F) is prohibited.

C4.3.2.2.2.2. The discharge of wastes with any of the following characteristics is prohibited:

C4.3.2.2.2.2.1 A liquid solution that contains $> 24\%$ alcohol by volume and has a flash point $< 60^{\circ}\text{C}$ (140°F).

C4.3.2.2.2.2.2 A non-liquid which under standard temperature and pressure can cause a fire through friction.

C4.3.2.2.2.2.3 An ignitable compressed gas.

C4.3.2.2.2.2.4 An oxidizer, such as peroxide.

C4.3.2.2.3. Reactivity and Fume Toxicity. The discharge of any of the following wastes is prohibited:

C4.3.2.2.3.1. Wastes that are normally unstable and readily undergo violent changes without detonating;

C4.3.2.2.3.2. Wastes that react violently with water;

C4.3.2.2.3.3. Wastes that form explosive mixtures with water or form toxic gases or fumes when mixed with water;

C4.3.2.2.3.4. Cyanide or sulfide waste that can generate potentially harmful toxic fumes, gases, or vapors;

C4.3.2.2.3.5. Waste capable of detonation or explosive decomposition or reaction at standard temperature and pressure;

C4.3.2.2.3.6. Wastes that contain explosives regulated by Chapter 5, "Hazardous Material"; and

C4.3.2.2.3.7. Wastes that produce any toxic fumes, vapors, or gases with the potential to cause safety problems or harm to workers.

C4.3.2.2.4. Corrosivity. It is prohibited to discharge pollutants with the potential to be structurally corrosive to the wastewater treatment plants. In addition, no discharge of wastewater below a pH of 5.5 is allowed, unless the wastewater treatment plant is specifically designed to handle that type of wastewater.

C4.3.2.2.5. Oil and Grease. The discharge of the following oils that can pass through or cause interference to the wastewater treatment plant is prohibited: petroleum oil, non-biodegradable cutting oil, and products of mineral oil origin.

C4.3.2.2.6. 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:

C4.3.2.2.6.1. Description of discharge practices, including non-routine batch discharges;

C4.3.2.2.6.2. Description of stored chemicals;

C4.3.2.2.6.3. Plan for immediately notifying the wastewater treatment plant of slug discharges and discharges that would violate prohibitions under this Chapter, including procedures for subsequent written notification within five days;

C4.3.2.2.6.4. 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;

C4.3.2.2.6.5. Proper procedures for building containment structures or equipment;

C4.3.2.2.6.6. Necessary measures to control toxic organic pollutants and solvents; and

C4.3.2.2.6.7. Proper procedures and equipment for emergency response, and any subsequent plans necessary to limit damage suffered by the treatment plant or the environment.

C4.3.2.2.7. Trucked and Hauled Waste. The discharge of trucked and hauled waste into the wastewater treatment system is prohibited except pumped wastewater as indicated below. These wastes are classified as special waste and shall be handled, treated, and disposed of in accordance with Chapter 6, "Hazardous Waste" or Chapter 7, "Solid Waste," as applicable.

C4.3.2.2.8. Pumped Wastewater. Wastewater that is pumped from a collection or holding tank, container, or vessel (e.g., wastewater pumped from septic systems, oil/water separators, bilge tanks, etc.) is classified as special waste and shall be handled, treated, and disposed of in accordance with Chapter 6, "Hazardous Waste" or Chapter 7, "Solid Waste," as applicable. The installation shall notify the Italian Base Commander prior to treating pumped wastewater (to include introduction to the wastewater treatment plant) where an authorization for this treatment does not exist (see Chapter 1 for the process).

C4.3.2.2.9. Heat. Heat in amounts that inhibit biological activity in the wastewater treatment plant resulting in interference, but in no case in such quantities that the temperature of the process water at the wastewater treatment plant exceeds 40°C (104°F).

C4.3.3. Effluent Limitations for Categorical Industrial Discharges. Any installations which have new or existing activities that fall into any of the industrial categories listed below must comply with the following effluent limitations (i.e., discharge limitations at the source of the discharge).

C4.3.3.1. Electroplating and Metal Degreasing. 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. 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.

C4.3.3.1.2. 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.

C4.3.3.1.3. Anodizing. Discharges of pollutants in process waters resulting from the anodizing of ferrous and nonferrous materials.

C4.3.3.1.4. Metal Coatings. Discharges of pollutants in process waters resulting from the chromating, phosphating, or immersion plating on ferrous and nonferrous materials.

C4.3.3.1.5. Chemical Etching and Milling. Discharges of pollutants in process waters resulting from the chemical milling or etching of ferrous and nonferrous materials.

C4.3.3.1.6. Electroless Plating. Discharges of pollutants in process waters resulting from the electroless plating of a metallic layer on a metallic or nonmetallic substrate.

C4.3.3.1.7. 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.

C4.3.3.1.8. The following discharge standards apply to new and existing facilities in the above electroplating subparts which discharge < 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
Total Toxic Organics	4.57	---

C4.3.3.1.9. The following discharge standards apply to new and existing facilities in the above electroplating subparts that discharge $\geq 38,000$ liters per day (10,000 gallons per day):

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
Total Metals	10.5	6.8
Total Toxic Organics	2.13	---

C4.3.3.1.10. In addition to the above standards, new and existing facilities that electroplate precious metals and that discharge $\geq 38,000$ liters per day (10,000 gallons per day) must comply with the following standard:

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

C4.3.3.1.11. The following discharge standards apply to new and existing facilities in the above electroplating subparts and to facilities conducting metal degreasing using chlorinated solvents regardless of the volume of wastewater discharged:

Parameter	Source of Discharge		Discharge to Surface Water	Discharge to Sewer System
	Monthly Average	Daily Average		
<u>Electroplating:</u>				
Cadmium ⁽²⁾	0.3 g/kg ⁽¹⁾	--	0.02 mg/L	0.02 mg/L
<u>Metal Degreasing:</u>				
1,2-dichloroethane (EDC) ⁽³⁾	0.1 mg/L	0.2 mg/L	1 mg/L	2 mg/L
Trichloroethylene (TCE) ⁽³⁾	0.2 mg/L	0.2 mg/L	1 mg/L	2 mg/L
Perchloroethylene (PCE) ⁽³⁾	0.1 mg/L	0.2 mg/L	1 mg/L	2 mg/L

Notes:

1. g of Cd discharged / kg of Cd used.
2. If Cd discharged < 10 kg/year, use surface water and sewer discharge values. If electroplating tanks > 1.5 m³, use monthly average discharges at the source.
3. All four sets of values shall be met for these parameters.

C4.3.3.2. 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 paragraph of this Chapter dealing with industrial dischargers. Monitoring of industrial discharges from electroplating operations using cadmium and metal degreasing shall be accomplished as follows:

C4.3.3.2.1. Electroplating. Daily sampling and monitoring for cadmium and measurement of the total volume of wastewater discharged and raw cadmium used in the process. Monitoring of all other parameters (including both sampling and analysis) will be accomplished quarterly.

C4.3.3.2.2. Metal Degreasing. Daily sampling and monitoring for the chlorinated solvents listed in C4.3.3.1.11.

C4.3.3.2.3. 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 wastewater has occurred and the facility has implemented a TTO management plan (see Table 4.2-b, "Monitoring Requirements.")

C4.3.4. Storm Water Management. Storm water conveyed to a separate sewer system can be discharged to soil or shallow subsoil (e.g., dry well) subject to restrictions in C4.3.1.6. The discharge of storm water directly into groundwater is prohibited.

C4.3.4.1. Plans. Develop and implement storm water pollution prevention (P2) plans (SWPPP) for activities listed in Table 4.5, "Best Management Practices," and if applicable Table 4.6 (for Tuscany). Update the SWPPP annually using in-house resources.

C4.3.4.2. Tuscany Region

C4.3.4.2.1. Storm water discharge shall be authorized by Italian authorities. All authorizations shall be obtained through the Italian Base Commander.

C4.3.4.2.2. The water from first flush shall be collected and treated separately whenever the risk of runoff from areas containing hazardous materials is present.

C4.3.4.2.3. Activities listed in Table 4.6 shall apply for an authorization by submitting the SWPPP when requesting a new and/or renewed wastewater discharge authorization. Activities not listed in Table 4.6, if already authorized to discharge other wastewater, shall request an authorization for storm water discharge when renewing the wastewater authorization.

C4.3.4.3. Veneto Region

C4.3.4.3.1. Storm water discharges deriving from installations listed in Table 4.7, and where the following occur, are considered potential sources of pollution:

C4.3.4.3.1.1. Wastes and/or raw materials are stored;

C4.3.4.3.1.2. Loading and unloading operations or other operations are carried out;

C4.3.4.3.1.3. Where the potential exists for storm water to transport the following pollutants:

Cadmium
Mercury
Hexachlorocyclohexane HCH
DDT
Pentachlorophenol PCP
Aldrin, dieldrin, endrin, isodrin
Hexachlorobenzene
Hexachlorobutadiene
Chloroform
Carbon tetrachloride
1,2, dichloroethane
Trichloroethylene
Trichlorobenzene (TCB)
Perchloroethylene (PER)
Arsenic
Chromium (Total and VI)
Nickel
Lead
Copper

Selenium
Zinc
Phenols
Persistent mineral oils and persistent hydrocarbons with petrol origins
Aromatic Organic Solvents
Nitrogenous Organic solvents
Halogenated Organic Compounds (including chlorinated pesticides)
Phosphorite pesticides
Tin organic compounds
Substances classified as carcinogenic and dangerous for the water environment

C4.3.4.3.2. The owner of storm water discharges generated by the above activities shall apply for the wastewater discharge authorization and submit a Technical Report on storm water via the Italian Base Commander (see Chapter 1 for process). The Competent Authority shall set the volume of storm water to be treated prior discharge (at least first flush).

C4.3.4.3.3. First flush shall be separated, treated and considered as industrial wastewater in the following cases:

C4.3.4.3.3.1. Courtyards, with an extension $> 2,000 \text{ m}^2$ (21,527 ft^2), serving car repair shops, body shops, car washes and wastewater treatment plants;

C4.3.4.3.3.2. Parking areas, with an extension $> 5,000 \text{ m}^2$ (53,820 ft^2), of installations listed in Table 4.7;

C4.3.4.3.3.3. Other non-roofed paved area of installations listed in Table 4.7 for which the Competent Authority has required treatment only for first flush;

C4.3.4.3.3.4. Courtyards and parking of residential/commercial areas, intermodal areas, with an extension $> 5,000 \text{ m}^2$ (53,820 ft^2);

C4.3.4.3.3.5. Surfaces in fuel stations.

C4.3.4.3.3.6. Precipitation events are considered separate when they occur within a timeframe > 48 hours from each other.

C4.3.4.3.4. Storm water runoff conveyed to a dedicated sewer system can be discharged to surface water or soil when it is derived from:

C4.3.4.3.4.1. Public and private roads;

C4.3.4.3.4.2. Courtyards, with an extension $< 2,000 \text{ m}^2$ (21,527 ft^2), serving car repair shops, body shops, car washes and wastewater treatment plants;

C4.3.4.3.4.3. Parking areas, with an extension $< 5,000 \text{ m}^2$ (53,820 ft^2), of installations listed in Table 4.7;

C4.3.4.3.4.4. Courtyards and parking of residential/commercial areas, public transit vehicles depots, intermodal areas, with an extension $< 5,000 \text{ m}^2$ (53,820 ft^2);

C4.3.4.3.4.5. All other surfaces not regulated under C4.3.4.3.1 and C4.3.4.3.3 above.

C4.3.4.3.5. Existing installations shall be compliant with the above by 8 December 2012.

C4.3.4.4. Employee Training. Personnel who handle hazardous substances or perform activities that could contribute pollution in wet weather events, should be trained in appropriate BMPs. 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 Systems. All discharges to septic systems shall be authorized. The authorization shall be obtained through the Italian Base Commander. 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 applicable.

C4.3.7. Reclaimed Wastewater

C4.3.7.1. Reclaimed wastewaters shall comply with quality standards listed in Table 4.8. Reclaimed wastewaters can be reused only for the following purposes:

C4.3.7.1.1. Irrigation: irrigation of cultivated areas, destined both to the production of food (for human or animals) or other products, irrigation of green, recreational/sport areas;

C4.3.7.1.2. Civil: for the washing of streets in urban areas, for the use in heating and/or cooling plants; in dual piping networks, separated from drinking waters. Their direct use in residential buildings is prohibited except for toilet discharges;

C4.3.7.1.3. Industrial: for firefighting, in processes, for washing, in heating cycles of industrial processes. Uses that imply the direct contact between reused water and food/pharmaceutical products/cosmetics are prohibited.

C4.3.7.2. The reuse of reclaimed wastewater shall be authorized within the wastewater treatment plant discharge authorization.

C4.3.7.3. Separate distribution networks shall be provided for reclaimed wastewater in a way to avoid cross contamination of drinking water.

C4.3.7.4. The whole distribution system for reclaimed wastewater shall be properly marked and be labeled clearly different from drinking water systems.

C4.3.8. Complaint System. A system for investigating water pollution complaints from individuals or Italian water pollution control authorities will be established, involving the DoD Lead Environmental Component (DoD LEC), as appropriate.

Table 4.1. Wastewater Discharge Limits for All Sources

Parameter	Unit	Urban Wastewater Discharge to a Surface Water	Urban Wastewater commingled with Industrial Wastewater ^{1 (20)}		Industrial Wastewater and Urban Wastewater Discharge to Soil ⁽¹⁸⁾
			Discharge to Italian Sewer System ⁽¹⁰⁾	Discharge to Surface Water	
BOD ₅ (as O ₂)	mg/L	2,000-10,000 IE ≤ 25 (without nitrification) or 70-90% reduction ^{(2) (5)} >10,000 IE ≤ 25 (without nitrification) or 80% reduction ⁽²⁾ Daily Average ⁽¹⁾	max 250	40	20
COD (as O ₂)	mg/L	2,000-10,000 IE ≤125 or 75% reduction ⁽³⁾ >10,000 IE ≤125 or 75% reduction ⁽³⁾ Daily Average ⁽¹⁾	max 500	160	100
TSS ⁽²⁾	mg/L	2,000-10,000 IE ≤ 35 or 90% reduction ^{(4) (5)} >10,000 IE ≤ 35 or 90% reduction ^{(4) (5)} Daily Average ⁽¹⁾	max 200	80 ¹	25
pH		6.0-9.0	6.0-9.0	6.0-9.0	6 – 8
SAR		--	--	--	10 ⁽¹⁶⁾
Temperature	°C	--	generally ≤ 3 °C above receiving water temp ⁽¹¹⁾	generally ≤ 3 °C above receiving water temp ⁽¹¹⁾	--
Color		--	not perceptible after 1:40 dilution	not perceptible after 1:20 dilution	--
Odor		--	cannot be a source of nuisance or discomfort	Cannot be a source of nuisance or discomfort	--
Coarse material		--	Absent	Absent	Absent

¹ For parameters other than those listed in the column titled “Urban Wastewater”

Parameter	Unit	Urban Wastewater Discharge to a Surface Water	Urban Wastewater commingled with Industrial Wastewater ^{1 (20)}		Industrial Wastewater and Urban Wastewater Discharge to Soil ⁽¹⁸⁾
			Discharge to Italian Sewer System ⁽¹⁰⁾	Discharge to Surface Water	
Al	mg/L	--	2	1	1
As	mg/L	--	0.5	0.5	0.05
Ba	mg/L	--	--	20	10
Be	mg/L	--	--	--	0.1
B	mg/L	--	4	2	0.5
Cd	mg/L	--	0.02	0.02	--
Total Cr	mg/L	--	4	2	1
Cr VI	mg/L	--	0.2	0.2	--
Fe	mg/L	--	4	2	2
Mn	mg/L	--	4	2	0.2
Hg	mg/L	--	0.005	0.005	--
Ni	mg/L	--	4	2	0.2
Pb	mg/L	--	0.3	0.2	0.1
Cu	mg/L	--	0.4	0.1	0.1
Se	mg/L	--	0.03	0.03	0.002
Sn	mg/L	--	--	10	3
V	mg/L	--	--	--	0.1
Zn	mg/L	--	1	0.5	0.5
Total Cyanides (as Cn)	mg/L	--	1	0.5	--
Free Active Chlorine	mg/L	--	0.3	0.2	0.2
Sulfide (as H ₂ S)	mg/L	--	2	1	0.5
Sulfite (as SO ₃)	mg/L	--	2	1	0.5
Sulfate (as SO ₄)	mg/L	--	1,000 ⁽¹³⁾	1,000 ⁽¹³⁾	500
Chlorides	mg/L	--	1,200 ⁽¹³⁾	1,200 ⁽¹³⁾	200
Fluorides	mg/L	--	12	6	1
Total Phosphorus (as P) ⁽¹⁷⁾	mg/L	Annual Average Urban Wastewater discharging to Surface Water in Sensitive Areas 10,000-100,000 IE ≤ 2 or 80% reduction ⁽⁷⁾ >100,000 IE ≤1 or 80% reduction ⁽⁷⁾	10 ⁽¹²⁾	10 ⁽¹²⁾	2
Total Nitrogen (as N) ⁽¹⁷⁾	mg/L	Annual Average Urban Wastewater	--	Industrial Wastewater	15

Parameter	Unit	Urban Wastewater Discharge to a Surface Water	Urban Wastewater commingled with Industrial Wastewater ^{1 (20)}		Industrial Wastewater and Urban Wastewater Discharge to Soil ⁽¹⁸⁾
			Discharge to Italian Sewer System ⁽¹⁰⁾	Discharge to Surface Water	
		discharging to Surface Water in Sensitive Areas 10,000-100,000 IE ≤15 or 70-80% reduction ^{(6) (8) (9)} >100,000 IE ≤10 or 70-80% reduction ^{(6) (8) (9)}		discharging to Surface Water in Sensitive Areas 10 ⁽¹²⁾	
Ammonium Nitrogen (as NH ₄)	mg/L	--	30 ⁽¹²⁾	15 ⁽¹²⁾ Daily Discharge (expressed as N) <30% of Total Nitrogen (N) Discharge	--
Nitrous Nitrogen (as N)	mg/L	--	0.6 ⁽¹²⁾	0.6 ⁽¹²⁾	--
Nitric Nitrogen (as N)	mg/L	--	30 ⁽¹²⁾	20 ⁽¹²⁾	--
Oil and Grease	mg/L	--	40	20	--
Total Hydrocarbons	mg/L	--	10	5	--
Total Phenols	mg/L	--	1	0.5	0.1
Total Aldehydes	mg/L	--	2	1	0.5
Total Aromatic Organic Solvents	mg/L	--	0.4	0.2	0.01
Total Nitrated Organic Solvents ⁽¹⁴⁾	mg/L	--	0.2	0.1	0.01
Total Surfactants	mg/L	--	4	2	0.5
Phosphorated Pesticides	mg/L	--	0.1	0.1	--
Total Pesticides (excluding phosphorated pesticides) ⁽¹⁵⁾	mg/L	--	0.05	0.05	--
Aldrin	mg/L	--	0.01	0.01	--

Parameter	Unit	Urban Wastewater Discharge to a Surface Water	Urban Wastewater commingled with Industrial Wastewater ^{1 (20)}		Industrial Wastewater and Urban Wastewater Discharge to Soil ⁽¹⁸⁾
			Discharge to Italian Sewer System ⁽¹⁰⁾	Discharge to Surface Water	
Dieldrin	mg/L	--	0.01	0.01	--
Endrin	mg/L	--	0.002	0.002	--
Isodrin	mg/L	--	0.002	0.002	--
Chlorinated Solvents ⁽¹⁵⁾	mg/L	--	2	1	--
Escherichia coli ⁽¹⁹⁾	UFC/100 ml	--	max 5,000 ⁽¹⁴⁾	max 5,000 ⁽¹⁴⁾	--
Acute Toxicity Test	LC50 ^{24h}	--	80% survival ⁽¹⁵⁾	50% survival ⁽¹⁵⁾	50% survival ⁽¹⁵⁾

Notes:

- (1) Analysis of discharges derived from lagooning or phytotreatment should be made on filtered samples. The suspended solids concentration shall not exceed 150 mg/L.
- (2) The analysis shall be conducted on a homogeneous, non-filtered, non-settled sample. The determination of dissolved oxygen is made before and after an incubation period of 5 days at 20 °C ± 1 °C in complete darkness, adding nitrification inhibitors.
- (3) The analysis shall be conducted on a homogeneous, non-filtered, non-settled sample with potassium dichromate.
- (4) The analysis shall be conducted through filtering of a representative sample using a membrane with a porous factor of 0.45 µm and drying with subsequent weighing, or through centrifugation for ≥ 5 minutes (average acceleration of 2800/3200 g), drying at 105 °C and weighing.
- (5) The percent reduction of BOD₅ should not be lower than 40%. For suspended solids, the concentration should not exceed 70 mg/L and the percent reduction should not be lower than 70%.
- (6) The average daily concentration of ammonium nitrogen (as N) discharged from the wastewater treatment system shall be <30% of the concentration for total nitrogen (as N) discharged from the system. This requirement does not apply to discharges to sea.
- (7) The reference method is the molecular absorption spectrophotometry.
- (8) Total nitrogen is intended as the sum of Kjeldahl nitrogen (organic nitrogen as N + NH₃) + nitric nitrogen + nitrous nitrogen. The reference method is the molecular absorption spectrophotometry.
- (9) As an alternative to the annual average concentration limit, provided that an equivalent level of environmental protection is obtained, reference can be made to the daily average concentration which cannot exceed 20 mg/L for each sample in which the effluent temperature is ≥ 12°C. The daily average concentration can be applied for a limited operative period when accounting for local climatic conditions.
- (10) The limits for discharge to a sewer system are mandatory in absence of limits set by the Competent Italian Authorities or in the absence of a final treatment system able to comply with the effluent limits prior to the final discharge.
- (11) For watercourses, the maximum variation from the average temperature of any section upstream or downstream of the discharge point shall not exceed 3°C. On at least half of any downstream section of the discharge point, the variation shall not exceed 1°C.

For lakes, the discharge temperature shall not exceed 30°C, while the temperature increase of the receiving water body shall not exceed 3°C at a distance of 50 meters from the discharge point.

For artificial canals, the maximum average value of water temperature in any section, shall not exceed 35°C. This condition is subject to the approval of the canals' administrator.

For sea and outlet zones of non-significant streams, the discharge temperature shall not exceed 35°C, and the temperature increase of the receiving water body shall not exceed 3°C at a distance of 1,000 meters from the discharge point. The environmental compatibility of the discharge with the receiving body shall be ensured, and the formation of thermal barriers shall be avoided at river outlets.

- (12) For industrial wastewater discharges to sensitive areas, the total phosphorous and nitrogen concentration limits are 1 and 10 mg/L, respectively.
- (13) The above limits are not valid for discharges to the sea. Inlet areas are comparable to coastal seawaters, provided that on at least half of any section downstream of the discharge, the natural variations of sulfates and chlorides are not altered.
- (14) During the authorization process of the urban wastewater treatment system, the Competent Authority will set the most appropriate limit according to the environmental and hygienic-sanitary conditions of the surface water receptor and according to the existing uses. A limit not exceeding 5,000 UFC/100 ml is advised.
- (15) The toxicity test is mandatory. In addition to the *Daphnia magna* test, an acute toxicity test may be conducted on *Ceriodaphnia dubia*, *Selenastrum capricornutum*, bioluminescent bacteria or organisms such as *Artemia salina*, for salty water discharges or other organisms. If different toxicity tests are performed, the worst result will be considered. The positive result of the toxicity test does not imply the direct application of the sanctions but it requires an in-depth review of the analytical results to determine the origin of the toxicity levels and their subsequent removal.
- (16) The Sodium Absorption Ratio (SAR) index is calculated as follows: $SAR = 2Na^+ / (Ca^{++} + Mg^{++})^{-1/2}$ where the ionic concentration unit is meq/L (milliequivalent/liter)
- (17) Concentration or percent reduction for total phosphorus and total nitrogen shall be obtained for either one of the two parameters or both depending on the local characteristics of the receptor.
- (18) Discharges to soil shall comply with provisions of C4.3.1.6. through C4.3.1.9.
- (19) During the authorization process of the urban wastewater treatment system, the Competent Authority will set the most appropriate limit. The recommended value in Veneto is 5000 UFC/100 ml.
- (20) Samples of urban wastewater containing industrial wastewater shall comply with composite three-hour averages.

Table 4.1.1. Wastewater Discharge Limits for Urban Wastewaters in the Veneto Region

Parameter #	Parameter ⁽¹⁾	Unit of Measure	Discharge into Surface Water				
			A	B	C	D	E
1	pH		6.0 – 9.0 ⁽²⁾	6.0 – 9.0 ⁽²⁾	6.0 – 9.0 ⁽²⁾	6.0 – 9.0 ⁽²⁾	6.0 – 9.0 ⁽²⁾
2	Temperature	°C	Generally ≤ 3°C above receiving water temp ⁽³⁾	Generally ≤ 3°C above receiving water temp ⁽³⁾	Generally ≤ 3°C above receiving water temp ⁽³⁾	Generally ≤ 3°C above receiving water temp ⁽³⁾	Generally ≤ 3°C above receiving water temp ⁽⁴⁾
3	Color		not perceptible after dilution of 1:40	not perceptible after dilution of 1:40	not perceptible after dilution of 1:20	not perceptible after dilution of 1:20	not perceptible after dilution of 1:20
4	Odor		Cannot be a source of nuisance or discomfort	Cannot be a source of nuisance or discomfort	Cannot be a source of nuisance or discomfort	Cannot be a source of nuisance or discomfort	cannot be a source of nuisance or discomfort
5	Coarse material		Absent	Absent	Absent	Absent	Absent
6	Total suspended solids (TSS) ⁽⁵⁾	mg/L	200 ⁽⁹⁾	150 ⁽⁹⁾⁽¹⁰⁾	35 ⁽⁹⁾	35 ⁽⁹⁾	35 ⁽¹⁷⁾
7	BOD ₅ (as O ₂) ⁽⁶⁾	mg/L	30 ⁽²²⁾ 45 ⁽²³⁾	30 ⁽²²⁾ 45 ⁽²³⁾	25 ⁽⁹⁾	25 ⁽⁹⁾	25 ⁽¹⁷⁾
8	COD (as O ₂) ⁽⁷⁾	mg/L	380 ⁽⁸⁾	250 ⁽¹⁰⁾	125	125	125 ⁽¹⁷⁾
9	Al	mg/L	2	2	1	1	-
10	As	mg/L	0.5	0.5	0.5	0.5	0.5
11	Ba	mg/L	20	20	20	2	40
12	Bo	mg/L	4 ⁽¹¹⁾	4	2 ⁽¹¹⁾	2	20
13	Cd	mg/L	0.02	0.02	0.02	0.01	0.02
14	Total Cr	mg/L	2	2	2	2	2
15	Cr VI	mg/L	0.2	0.2	0.2	0.1	0.2
16	Fe	mg/L	4	4	2	2	
17	Mn	mg/L	4	4	2	2	
18	Hg	mg/L	0.005	0.005	0.005	0.002	≤ 0.005
19	Ni	mg/L	2	2	2	0.1	2
20	Pb	mg/L	0.2	0.2	0.2	0.1	0.2
21	Cu	mg/L	0.1	0.1	0.1	0.05	0.1
22	Se	mg/L	0.03	0.03	0.03	0.02	≤ 0.03
23	Sn	mg/L	10	10	10	10	-
24	Zn	mg/L	0.5	0.5	0.5	0.5	0.5

Parameter #	Parameter ⁽¹⁾	Unit of Measure	Discharge into Surface Water				
			A	B	C	D	E
25	Total Cyanides (as CN)	mg/L	0.5	0.5	0.5	0.1	1
26	Free active chlorine	mg/L	0.5	0.5	0.3	0.2	2
27	Sulfides (as H ₂ S)	mg/L	2	2	1	0.5	2
28	Sulfites (as SO ₃)	mg/L	2	2	1	1	10
29	Sulfates (as SO ₄)	mg/L	1000 ^{(12) (15)}	1000	1000 ^{(12) (15)}	500	
30	Chlorides	mg/L	1200 ^{(12) (15)}	1200	1200 ^{(12) (15)}	400	
31	Fluorides	mg/L	12	12	6	3	20
32	Total Phosphorus (as P)	mg/L	20 ⁽¹³⁾	15 ⁽¹³⁾	10 ⁽¹³⁾	5 ⁽¹³⁾	20 ⁽¹³⁾
33	Ammonium nitrogen (as NH ₄)	mg/L	30 ⁽¹⁴⁾	30 ⁽¹⁴⁾	15 ⁽¹⁴⁾	5 ⁽¹⁴⁾	30 ^{(17) (14)}
34	Nitrous Nitrogen (as N)	mg/L	2 ⁽¹⁴⁾	2 ⁽¹⁴⁾	0.6 ⁽¹⁴⁾	0.2 ⁽¹⁴⁾	2 ⁽¹⁴⁾
35	Nitric Nitrogen (as N)	mg/L			20 ⁽¹⁴⁾	20 ⁽¹⁴⁾	50 ⁽¹⁴⁾
35.1	Total inorganic nitrogen (as N)	mg/L	55	55			
36	Animal/vegetal oil and grease	mg/L	40	20	20	20	20 ⁽¹⁶⁾
37	Total hydrocarbons: - mineral oils - PAH	mg/L	5	5	2	5 0.4 0.05	3 ⁽¹⁸⁾
38	Phenols	mg/L	0.5	0.5	0.5	0.005	0.5
38.1	Clorophenol ^{(2) (4)}	mg/L			0.1	0.001	
38.2	2,4, dinitro cresol	mg/L			0.1	0.001	
38.3	2,4 dinitrophenol	mg/L			0.15	0.0015	
38.4	2,4 dichlorophenol	mg/L			0.01	0.0001	
38.5	Phenol	mg/L			0.5	0.005	
38.6	Nitrophenyl ^{(2) (4)}	mg/L			0.5	0.005	
38.7	Pentachlorophenol	mg/L			0.01	0.0001	
38.8	2,4,6 trinitrophenol	mg/L			0.5	0.005	
39	Aldehydes	mg/L	1	1	1	0.01	4
39.1	Acrolein	mg/L			0.002	absent	

Parameter #	Parameter ⁽¹⁾	Unit of Measure	Discharge into Surface Water				
			A	B	C	D	E
40	Aromatic Organic Solvents	mg/L	0.2	0.2	0.2	0.002	0.2
40.1	Benzene	mg/L			0.1	0.001	
40.2	Ethylbenzene	mg/L			0.2	0.002	
40.3	Styrene	mg/L			0.2	0.002	
40.4	Toluene	mg/L			0.1	0.001	
40.5	Xylene	mg/L			0.1	0.001	
41	Nitrated Organic Solvents	mg/L	0.1	0.1	0.1	0.001	0.1
41.1	Anilyn	mg/L			0.1	0.001	
41.2	Toluidine (orto)	mg/L			0.1	0.001	
41.3	Toluidine (meta, para)	mg/L			0.05	0.0005	
41.4	Dimethylformamide	mg/L			0.1	0.001	
41.5	Nitrobenzene	mg/L			0.1	0.001	
41.6	Piridyne	mg/L			0.1	0.001	
41.7	Xylidine	mg/L			0.1	0.001	
42	Total Surfactants	mg/L		4	2	0.5	
42.1	Anionic surfactants	mg/L					6
43	Phosphorated Pesticides	mg/L	0.1	0.1	0.1	0.001	0.1
43.1	Chlorinated pesticides	mg/L			0.05	0.0005	
44	Total Pesticides (except phosphorated ones), including:	mg/L	0.05	0.05	0.05	0.05	0.05
45	Aldrin	mg/L	0.01	0.01	0.01	0.01	
46	Dieldrin	mg/L	0.01	0.01	0.01	0.01	
47	Endrin	mg/L	0.002	0.002	0.002	0.002	
48	Isodrin	mg/L	0.002	0.002	0.002	0.002	
49	Chlorinated solvents	mg/L	1	1	1	0.01	1
49.1	Chloroform	mg/L			0.1	0.001	
49.2	1,2 Dichlorobenzene	mg/L			0.1	0.001	
49.3	1,3 Dichlorobenzene	mg/L			0.5	0.005	

Parameter #	Parameter ⁽¹⁾	Unit of Measure	Discharge into Surface Water				
			A	B	C	D	E
49.4	1,4 Dichlorobenzene	mg/L			0.3	0.003	
49.5	1,1 Dichloroethylene	mg/L			1	0.01	
49.6	1,2 Dichloroethylene	mg/L			1	0.01	
49.7	Tetrachloroethylene	mg/L			0.5	0.005	
49.8	Trichloroethylene	mg/L			1	0.01	
49.9	Carbon Tetrachloride	mg/L			1	0.01	
49.10	Sum of Carbon Sulfur, Trichloroethylene, Chloroform, Carbon Tetrachloride, Dichloroethylene	mg/L					2
49.11	Other non mentioned organic compounds (pesticides, solvents, plastifiers etc.)	mg/L					0.1
50	Escherichia coli	UFC/100 ml	5000 ⁽²¹⁾	5000 ⁽²¹⁾	5000 ⁽²¹⁾	5000 ⁽²¹⁾	5000 ^{(19) (21)}
51	Acute Toxicity Test ⁽²¹⁾	LC50 ^{24h}		≤ 50% survival after 24 hours	≤ 50% survival after 24 hours	≤ 50% survival after 24 hours	

Notes:

- (1) Analysis of discharges derived from lagooning or phytopurification should be made on filtered samples. The suspended solids concentration shall not exceed 150 mg/L.
- (2) pH values of the receptor shall be in the range of 6.5-8.5 within 50 m from the discharge.
- (3) For watercourses, the maximum variation from the average temperature of any section upstream or downstream of the discharge point shall not exceed 3°C. On at least half of any downstream section of the discharge point, the variation shall not exceed 1°C.
 For lakes, the discharge temperature shall not exceed 30°C, while the temperature increase of the receiving water body shall not exceed 3°C at a distance of 50 meters from the discharge point.
 For artificial canals, the maximum average value of water temperature in any section, shall not exceed 35°C. This condition is subject to the approval of the canals' administrator.
 For sea and outlet zones of non-significant streams, the discharge temperature shall not exceed 35°C, and the temperature increase of the receiving water body shall not exceed 3°C at a distance of 1,000 meters from the discharge point. The environmental compatibility of the discharge with the receiving body shall be ensured, and the formation of thermal barriers shall be avoided at river outlets.
- (4) Temperature increase of the receptor shall not exceed 3°C in the first 2m (from the water surface) at 1,000 m from the discharge.

- (5) The analysis shall be conducted through filtering of a representative sample using a membrane with a porous factor of 0.45 mm and drying at 105°C with subsequent weighing, or through centrifugation for ≥ 5 minutes (average acceleration of 2800/3200 g), drying at 105°C and weighing.
- (6) The analysis shall be conducted on a homogeneous, non-filtered, non-settled sample. The determination of the dissolved oxygen is made before and after an incubation period of 5 days at $20\text{ }^{\circ}\text{C} \pm 1\text{ }^{\circ}\text{C}$ in complete darkness, adding nitrification inhibitors.
- (7) The analysis shall be conducted on a homogeneous, non-filtered, non-settled sample with potassium dichromate.
- (8) The percent reduction should not be lower than 70%.
- (9) For urban wastewater discharge into surface waters located on the mountains (above 1,500 m), the percent reduction of BOD₅, should not be lower than 40%. For suspended solids, the concentration should not exceed 70 mg/L and the percent reduction should not be lower than 70%.
- (10) Threshold limits for Total Suspended Solids, BOD₅ and COD are reduced to 35 mg/L, 25 mg/L, 125 mg/L for mountain areas in which column B is applied for plants capacity in the range 2,000 10,000 IE.
- (11) For coastal areas the threshold limit for Boron is 10 mg/L.
- (12) Non applied to discharges into the sea.
- (13) For urban discharges in sensitive areas generated by residential areas with IE in the range 10,000 – 100,000 the limit is reduced to 2 mg/L. For urban discharges in sensitive areas generated by residential areas with IE > 100,000 the limit is reduced to 1 mg/L. For urban discharges into sensitive lakes, both directly or in within 10 km from the coastline, the limit is reduced to 0.5 mg/L.
- (14) For urban discharges in sensitive areas generated by residential areas with IE in the range 10,000 – 100,000 the limit for total nitrogen is reduced to 15 mg/L. For urban discharges in sensitive areas generated by residential areas with IE > 100,000 the limit is reduced to 10 mg/L. For urban discharges into sensitive lakes, both directly or in within 10 km from the coastline, the limit is reduced to 10 mg/L.
- (15) For this threshold, which is not applicable to discharges into sea, waters of the river mouth area are considered as coastal water under the condition that natural concentration conditions are not varied in 50% of any section downgradient of the discharge.
- (16) Different threshold limits could be set in the authorization depending on the use of water of the final receptor.
- (17) For discharges located between the mouths of the Sile and Brenta Rivers up to a distance of 6 marine miles from the coast, the applied threshold limit is 5 mg/L.
- (18) For discharges with flow rate lower than 50 m³/day, the limit is 7.5 mg/L.
- (19) During the bathing season, in bathing water the limit of 100 ufc/100 mL cannot be exceeded. If it is exceeded, the Competent Authority granting the wastewater discharge authorization prescribes specific disinfection measures; particular restrictions, defined for each specific case, are applied for discharges in areas close to shell farming.
- (20) The toxicity test is mandatory. In addition to the Daphnia magna test, an acute toxicity test may be conducted on Ceriodaphnia dubia, Selenastrum capricornutum, bioluminescent bacteria or organisms such as Artemia salina, for salty water discharges or other organisms among those which will be identified. If different toxicity tests are performed, the worst result is to be considered. The positive result of the toxicity test does not imply the direct application of the sanctions established but it requires an in-depth review of the analytical results to determine the origin of the toxicity levels and their subsequent removal.
- (21) The limits are applied when required by the use of the receptor.
- (22) 30 day average
- (23) 7 day average

Table 4.1.1-a. Criteria for the Application of Column A, B, D, C, E of Table 4.1.1

	Homogeneous Protection Areas					
	Mountain area	Plain area with low residential density	Plain area with high residential density	Groundwater recharge area	Coastal area	Sea water
IE						
<100						E
100 - 199				A		E
200 - 499			A	A	A	E
500 – 1,999	A	A	A	B	A	E
2,000 – 9,999	B	C	C	D	C	E
≥ 10,000	C	C	C	D	C	E

Table 4.1.1-b. Threshold Values for Urban Wastewater in the Veneto Region

Homogeneous Protection Area	Threshold Value (Inhabitant Equivalents – IE)
Mountain area	500
Plain area with low residential density	500
Plain area with high residential density	200
Groundwater recharge area	100
Coastal area	200

Table 4.1.2-a. Required Systems in the Tuscany Region for the Treatment of Domestic and Urban Wastewater Generated by Installations < 2,000 IE and Discharging to Fresh Water

Quality of Fresh Water	Normal	Good or very good	Normal	Good or very good	Normal	Good or very good
Inhabitant Equivalents (IE)	< 100		101 to 500		501 to 2000	
Treatment systems	A	B	C	D	E	F
Septic tank (two-stage, three stage or Imhoff) and sub-irrigation and drainage ⁽²⁾	X		X			
Septic tank (two-stage, three stage or Imhoff) and draining trench	X					
Septic tank (two-stage, three stage or Imhoff) and sub-surface phytopurification with horizontal flow (HF)	X		X		X	X
Septic tank (two-stage, three stage or Imhoff) and sub-surface phytopurification with vertical flow (VF)	X	X	X		X	X
Septic tank (two-stage, three stage or Imhoff) and pond or series of ponds ⁽¹⁾	X		X		X	X
Pond (optional) and phytopurification with free water surface (FWS) ⁽¹⁾	X		X		X	X
Septic tank (two-stage, three stage or Imhoff) and combined phytopurification (HF/VF/FWS) ⁽¹⁾		X			X	X
Septic tank (two-stage, three stage or Imhoff) and combined phytopurification (HF/VF/FWS) and sand filter ⁽¹⁾				X	X	X
Anaerobic pond and combined phytopurification (HF/VF/FWS) ⁽¹⁾		X		X	X	X
Septic tank (two-stage, three stage or Imhoff) and intermittent sand filter		X	X	X		
Three-stage septic tank and pond ⁽¹⁾			X			
Septic tank (two-stage, three stage or Imhoff) and percolating filter or activated sludge or biodisc filter			X		X	
Septic tank (two-stage, three stage or Imhoff) and prolonged venting system					X	
Primary treatment and OX-ANOX system						X
Sequence batch reactor (SBR)						X
Clariflocculation					X	X
Biological plant and phytopurification						X
Alternate cycles process						X

Notes:

- (1) The use of ponds or lagoons shall be approved. All authorizations shall be obtained through the Italian Base Commander.
- (2) The sub-irrigation in the shallow subsoil is considered a treatment device carrying out oxidation and digestion of the wastewater and therefore is not considered a device for discharge to soil.

Table 4.1.2-b. Required Systems in the Tuscany Region for the Treatment of Domestic and Urban Wastewater Generated by Installations < 10,000 IE and Discharging to Sea Water

Quality of Sea Water	Normal	Sensitive Area
Inhabitant Equivalents (IE)	< 10,000	
Treatment systems	A	B
Septic tank (two-stage, three stage or Imhoff) and fine screen and off-shore conduit	X	
Septic tank (two-stage, three stage or Imhoff) and percolating filter or activated sludge or biodisc filter	X	
Septic tank (two-stage, three stage or Imhoff) and prolonged venting system	X	
Primary treatment and OX-ANOX system		X
Biological plant and phytoremediation		X
Biological plant and pond or clariflocculation ⁽¹⁾		X
Alternate cycles process	X	X

Notes:

- (1) The use of ponds or lagoons shall be approved. All authorizations shall be obtained through the Italian Base Commander.

Table 4.2-a. Monitoring Frequency for Discharges of Urban Wastewater

Plant Capacity (in IE)			# of Samples ⁽¹⁾		
All other Regions	Veneto Region	Tuscany Region	All other Regions	Veneto Region	Tuscany Region
1 to 1,999	From threshold values ⁽²⁾ to 1,999	501 to 2000	None specified	2 samples during the first year e 1 sample every 2 years, if in compliance; if one of the samples is not in compliance, 1 sample shall be collected in the following year.	2
2,000 to 9,999		2,001 to 10,000	12 samples during the first year and 4 samples/year thereafter, if in compliance; if one of the 4 samples is not in compliance, 12 samples shall be collected the following year		
10,000 to 49,999		10,001 to 49,999	12 samples/year		
> 50,000			24 samples/year		

Notes:

- (1) The column specifies the minimum annual number of samples. Samples shall be taken at regular intervals during the year. An equal number of self-monitoring samples shall be collected by the manager of the wastewater treatment plant from both influent and effluent.
- (2) See Table 4.1.1-b

Table 4.2-b. Monitoring Requirements

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

Table 4.3. Number of Nonconforming Samples Allowed for BOD₅, COD, and TSS for Urban Wastewater

# of Samples Collected Annually	Maximum # of Nonconforming Samples Allowed(1)	# of Samples Collected Annually	Maximum # of Nonconforming Samples Allowed (1)
4 – 7	1	172 – 187	14
8 – 16	2	188 – 203	15
17 – 28	3	204 – 219	16
29 – 40	4	220 – 235	17
41 – 53	5	236 – 251	18
54 – 67	6	252 – 268	19
68 – 81	7	269 – 284	20
82 – 95	8	285 – 300	21
96 – 110	9	301 – 317	22
111 – 125	10	318 – 334	23
126 – 140	11	335 – 350	24
141 – 155	12	351 – 365	25
156 – 171	13	-	-

Notes:

(1) For the discharge to be considered acceptable, the concentrations specified in Table 4.1 for Urban Wastewater cannot be exceeded by the percentage indicated below:

BOD₅: 100%
 COD: 100%
 Suspended solids: 150%

Table 4.4. 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 (dibenzo (a,h) anthracene)
4-Chlorophenyl phenyl ether	1,12-Benzoperylene (benzo (g,h,i) perylene)
Acid Extractable Organics	
2-Chlorophenol	2,4,6-Trichlorophenol
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 4.5. 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

Table 4.6. Tuscany Region - Activities for which the Storm Water Plan Shall be Developed

1.1	Energy industries - Combustion installations with a rated thermal input exceeding 50 MW - Mineral oil and gas refineries - Coke ovens - Coal gasification and liquefaction plants
1.2	Production and processing of metals - Metal ore (including sulfide ore) roasting or sintering installations - Installations for the production of pig iron or steel (primary or secondary fusion) including continuous casting, with a capacity exceeding 2.5 tonnes per hour - Installations for the processing of ferrous metals: - o hot-rolling mills with a capacity exceeding 20 tonnes of crude steel per hour - o smitheries with hammers, the energy of which exceeds 50 kj per hammer, where the calorific power used exceeds 20 MW - o application of protective fused metal coats with an input exceeding 2 tonnes of crude steel per hour - Ferrous metal foundries with a production capacity exceeding 20 tonnes per day - Installations - o for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes - o for the smelting, including the alloyage, of non-ferrous metals, including recovered products, (refining, foundry casting, etc.) with a melting capacity exceeding 4 tonnes per day for lead and cadmium or 20 tonnes per day for all other metals - Installations for surface treatment of metals and plastic materials using an electrolytic or chemical process where the volume of the treatment vats exceeds 30 m³
1.3	Mineral industry - Installations for the production of cement clinker in rotary kilns with a production capacity exceeding 500 tonnes per day or lime in rotary kilns with a production capacity exceeding 50 tonnes per day or in other furnaces with a production capacity exceeding 50 tonnes per day - Installations for the production of asbestos and the manufacture of asbestos-based products - Installations for the manufacture of glass including glass fiber with a melting capacity exceeding 20 tonnes per day - Installations for melting mineral substances including the production of mineral fibers with a melting capacity exceeding 20 tonnes per day - Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware or porcelain, with a production capacity exceeding 75 tonnes per day, and/or with a kiln capacity exceeding 4 m³ and with a setting density per kiln exceeding 300 kg/m³

1.4	Chemical industry Production within the meaning of the categories of activities contained in this section means the production on an industrial scale by chemical processing of substances or groups of substances listed below: - Chemical installations for the production of basic organic chemicals, such as: - o simple hydrocarbons (linear or cyclic, saturated or unsaturated, aliphatic or aromatic) - o oxygen-containing hydrocarbons such as alcohols, aldehydes, ketones, carboxylic acids, esters, acetates, ethers, peroxides, epoxy resins - o sulfurous hydrocarbons - o nitrogenous hydrocarbons such as amines, amides, nitrous compounds, nitro compounds or nitrate compounds, nitriles, cyanates, isocyanates - o phosphorus-containing hydrocarbons - o halogenic hydrocarbons - o organometallic compounds - o basic plastic materials (polymers synthetic fibers and cellulose-based fibers) - o synthetic rubbers - o dyes and pigments - o surface-active agents and surfactants - Chemical installations for the production of basic inorganic chemicals, such as: - o gases, such as ammonia, chlorine or hydrogen chloride, fluorine or hydrogen fluoride, carbon oxides, sulfur compounds, nitrogen oxides, hydrogen, sulfur dioxide, carbonyl chloride - o acids, such as chromic acid, hydrofluoric acid, phosphoric acid, nitric acid, hydrochloric acid, sulfuric acid, oleum, sulfurous acids - o bases, such as ammonium hydroxide, potassium hydroxide, sodium hydroxide - o salts, such as ammonium chloride, potassium chlorate, potassium carbonate, sodium carbonate, perborate, silver nitrate - o non-metals, metal oxides or other inorganic compounds such as calcium carbide, silicon, silicon carbide - Chemical installations for the production of phosphorous-, nitrogen- or potassium-based fertilizers (simple or compound fertilizers) - Chemical installations for the production of basic plant health products and of biocides - Installations using a chemical or biological process for the production of basic pharmaceutical products - Chemical installations for the production of explosives

1.5	Waste management - Installations for the disposal or recovery of hazardous waste (operations from D1 to D15, R 1, R 5, R 6, R 8 and R 9- refer to table below) with a capacity exceeding 10 tonnes per day - Installations for the incineration of municipal waste with a capacity exceeding 3 tonnes per hour - Installations for the disposal of non-hazardous waste (operations D8 D9- refer to table below), with a capacity exceeding 50 tonnes per day - Landfills receiving > 10 tonnes per day or with a total capacity exceeding 25000 ton, excluding landfills of inert waste
1.6	Other activities - Industrial plants for the production of: - o pulp from timber or other fibrous materials - o paper and board with a production capacity exceeding 20 tonnes per day - Plants for the pre-treatment (operations such as washing, bleaching, mercerization) or dyeing of fibers or textiles where the treatment capacity exceeds 10 tonnes per day - Plants for the tanning of hides and skins where the treatment capacity exceeds 12 tonnes of finished products per day - - o Slaughterhouses with a carcass production capacity > 50 tonnes per day - o Treatment and processing intended for the production of food products from: - animal raw materials (other than milk) with a finished product production capacity > 75 tonnes per day - vegetable raw materials with a finished product production capacity > 300 tonnes per day (average value on a quarterly basis) - o Treatment and processing of milk, the quantity of milk received being > 200 tonnes per day (average value on an annual basis) - Installations for the disposal or recycling of animal carcasses and animal waste with a treatment capacity exceeding 10 tonnes per day - Installations for the intensive rearing of poultry or pigs with more than: - o 40,000 places for poultry - o 2,000 places for production pigs (over 30 kg), or - o 750 places for sows - Installations for the surface treatment of substances, objects or products using organic solvents, in particular for dressing, printing, coating, degreasing, waterproofing, sizing, painting, cleaning or impregnating, with a consumption capacity of > 150 kg per hour or > 200 tonnes per year - Installations for the production of carbon (hard-burnt coal) or electrographite by means of incineration or graphitization
2	Fuel station. Hydrocarbon depot plants.

3	Installation for the processing of mineral oils not included among above points 1.1 - 1.6 and depots of mineral oils
4	Plants for the storage, collection and treatment of end of life vehicles
5	Waste management plant not included among above points 1.1 - 1.6
6	Installation for the production of paper paste derived from wood or other materials and/or for the production of paper and cardboard
7	Installation for pre-treatment or dyeing of fibers or textiles
8	Installation for leather tanning
9	Installation for the surface treatment of matters, objects or products using organic solvents (starching, printing, spreading, degreasing, water proofing, gluing, painting, cleaning or impregnating)
10	Installations operating in one of the following production activities: Cadmium: - Extraction of zinc, lead, and zinc refinery, non-ferrous metal industry, metallic cadmium industry - Cadmium compound fabrication - Pigment production - Stabilization product fabrication - Primary and secondary battery fabrication - Electroplating (Galvanic plating) Mercury: - Recycled pickling – to be applied to the Hg present in the effluents coming from chloride production unit. - Recycled pickling – to be applied to total Hg present in all wastewater containing Hg coming from the industrial plant - Waste pickling – to be applied to total Hg present in all wastewater containing Hg coming from the industrial plant - Industries using Hg-catalyzers for vinyl chloride production - Industries using Hg-catalyzers for other production - Fabrication of Hg-catalyzers used for monomer vinyl chloride production - Fabrication of inorganic and organic Hg compounds - Fabrication of primary batteries containing Hg - Non-ferrous metal industry: Hg recovery facility Extraction/refinery of non-ferrous metals - Hg-containing hazardous waste treatment plants Hexachlorohexane (HCH) - HCH production - Lindane extraction - Production and extraction of lindane DDT - DDT production, including on-site formulation of DDT Pentachlorophenol (PCP) - PCP production from hexachlorobenzene hydrolysis Aldrin, dieldrin, endrin, isodrin - Production and formulation of: Aldrin, dieldrin, endrin, and/or isodrin - HCB production and treatment

	Hexachlorobenzene (HCB) - Perchloroethylene (PCE) and Carbon Tetrachloride (CCl₄) production through perchlorination - Trichloroethylene and/or perchloroethylene production through other techniques Hexachlorobutadiene - Perchloroethylene (PCE) and Carbon Tetrachloride (CCl₄) production through perchlorination; - Trichloroethylene and/or perchloroethylene production through other techniques Chloroform - Chloromethane production from methanol or from combination of methanol and methane - Chloromethane production through chlorination of methane Carbon tetrachloride - Carbon tetrachloride production through perchlorination – washing technique - Carbon tetrachloride production through perchlorination – no-washing technique - Chloromethane production through chlorination of methane (including pressurized chlorolysis from methanol) - CFCs production 1,2-dichloroethane (EDC) - 1,2-dichloroethane production only - 1,2-dichloroethane production and transformation and/or use at the same plant, except for the use and production of heat exchangers - EDC use for metal degreasing (in industrial plants different from those above) - Transformation of 1,2-dichloroethane in substances different from vinyl chloride Trichloroethylene - Trichloroethylene and perchloroethylene production - Use of trichloroethylene for metal degreasing Trichlorobenzene (TCB) - Production of TCB through dehydrochlorination and /or TCB transformation - Production and transformation of chlorobenzene through chlorination Perchloroethylene (PCE) - Trichloroethylene and perchloroethylene production - Carbon tetrachloride and perchloroethylene production - Use of PCE for metal degreasing - Chlorofluorocarbon production

	Disposal Operations
D1	Tipping above or underground (e.g., landfill, etc.)
D2	Land treatment (e.g., biodegradation of liquid or sludge discards in soils, etc.)
D3	Deep injection (e.g., injection of pump able discards into wells, salt domes or naturally occurring repositories, etc.)
D4	Surface impoundment (e.g., placement of liquid or sludge discards into pits, ponds or lagoons, etc.)
D5	Specially engineered landfill (e.g., placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)
D6	Release of solid waste into a water body except seas/oceans
D7	Release into seas/oceans including seabed insertion
D8	Biological treatment not specified elsewhere in this Table which results in final compounds or mixtures which are disposed of by means of any of the operations in this Table
D9	Physic-chemical treatment not specified elsewhere in this Table which results in final compounds or mixtures which are disposed of by means of any of the operations in this Table (e.g., evaporation, drying, calcination, etc.)
D10	Incineration on land
D11	Incineration at sea
D12	Permanent storage (e.g., emplacement of containers in a mine, etc.)
D13	Blending or mixture prior to submission to any of the operations in this Table
D14	Repackaging prior to submission to any of the operations in this Table
D15	Storage pending any of the operations in this Table, excluding temporary storage, pending collection, on the site where it is produced.
	Recovery operations
R1	Use principally as a fuel or other means to generate energy
R5	Recycling/reclamation of other inorganic materials
R6	Regeneration of acids or bases
R8	Recovery of components from catalysts
R9	Oil re-refining or other re-uses of oil

Table 4.7. Veneto Region – Installations for which the Submission of a Technical Report on Storm Water is Required

ID	Type of Installation
1.	Energy industries
1.1	Combustion installations with a rated thermal input exceeding 50 MW
1.2	Mineral oil and gas refineries
1.3	Coke ovens
1.4	Coal gasification and liquefaction plants
2.	Production and processing of metals
3.	Plant for metal treatment and coating
4.	Mineral industry
4.1	Installations for the production of cement clinker or quicklime
4.2	Installations for the production of asbestos and the manufacture of asbestos-based products
4.3	Installations for the manufacture of glass including glass fiber
4.4	Installations for melting mineral substances including the production of mineral fibers
4.5	Installations for the manufacture of ceramic products by firing, in particular roofing tiles, bricks, refractory bricks, tiles, stoneware
5.	Chemical industry
6.	Plants for waste disposal, recovery, waste storage and selection
7.	Plants for the production of tires
8.	Scraps depots
9.	End of life vehicle depots
10.	Plants for leather tanning and dyeing
11.	Installation for the production of paper paste derived from wood or other materials and/or for the production of paper and cardboard
12.	Installation for pre-treatment or dyeing of fibers or textiles
13.	Slaughterhouse with the generation of > 50 ton/day of carcasses
14.	Plants for the disposal, recovery of carcass or animal residues with treatment capacity > 10 tonnes/day
15.	Installation for the surface treatment of matters, objects or products using organic solvents (starching, printing, spreading, degreasing, water proofing, gluing, painting, cleaning or impregnating) with solvent consumption > 150 kg/hour or 200 tonnes/year
16.	Plants for the production of carbon or graphite for electrical use

Table 4.8. Applicable limits of the Reclaimed Wastewater Treatment System

	Parameter	Unit	Applicable limit for irrigation and civil uses ⁽¹⁰⁾	Applicable limit for industrial uses ⁽⁹⁾
Chemical – Physical parameters ⁽¹³⁾	pH	mg/L	6 – 9.5 ⁽¹¹⁾	5.5 – 9.5
	Temperature	°C	--	⁽¹⁾
	SAR	mg/L	10	
	Coarse material	mg/L	Absent	Absent
	TSS	mg/L	10	80 ⁽²⁾
	BOD ₅ (as O ₂)	mg/L	20	40 ⁽²⁾
	COD (as O ₂)	mg/L	100	160 ⁽²⁾
	Total Phosphorus (as P)	mgP/L	2 ⁽¹²⁾	10
	Total Nitrogen (as N)	mgN/L	15 ⁽¹²⁾	10
	Ammonium Nitrogen (as NH ₄)	mg NH ₄ /L	2 ⁽¹¹⁾	15
	Electric conductivity	uS/cm	3,000	--
	Al	mg/L	1 ⁽¹¹⁾	1
	As	mg/L	0.02	0.5
	Ba	mg/L	10	20
	Be	mg/L	0.1	--
	B	mg/L	1	2
	Cd	mg/L	0.005	0.02
	Co	mg/L	0.05	--
	Total Cr	mg/L	0.1	2
	Cr VI	mg/L	0.005	0.2
	Fe	mg/L	2 ⁽¹¹⁾	2
	Mn	mg/L	0.2 ⁽¹¹⁾	2
	Hg	mg/L	0.001	0.005
	Ni	mg/L	0.2	2
	Pb	mg/L	0.1	0.2
	Cu	mg/L	1	0.1
	Se	mg/L	0.01	0.03
	Sn	mg/L	3	10
	Tl	mg/L	0.001	--
	V	mg/L	0.1	--
	Zn	mg/L	0.5	0.5
	Total Cyanides (as Cn)	mg/L	0.05	0.5
	Sulfide (as H ₂ S)	mg/L	0.5	1
	Sulfite (as SO ₃)	mg/L	0.5	1
	Sulfate (as SO ₄)	mg/L	500 ⁽¹¹⁾	1,000 ⁽³⁾
	Free Active Chlorine	mg/L	0.2	0.2
	Chlorides	mgCl/L	250 ⁽¹¹⁾	1,200 ⁽³⁾
	Fluorides	mgF/L	1.5	6

	Parameter	Unit	Applicable limit for irrigation and civil uses ⁽¹⁰⁾	Applicable limit for industrial uses ⁽⁹⁾
	Oil and Grease	mg/L	10	20
	Mineral oil	mg/L	0.05 ⁽⁶⁾	--
	Total Phenols	mg/L	0.1	0.5
	Pentachlorophenol	mg/L	0.003	--
	Total Aldehydes	mg/L	0.5	1
	Tetrachloroethylene, Trichloroethylene - Sum of the concentration of the specific parameters.	mg/L	0.01	--
	Chlorinated Solvents	mg/L	0.004	1
	Trihalomethane - Sum of the concentration	mg/L	0.003	--
	Total Aromatic Organic Solvents	mg/L	0.01	0.2
	Benzene	mg/L	0.001	--
	Benzo[a]pyrene	mg/L	0.00001	--
	Total Nitrated Organic Solvents	mg/L	0.01	0.1
	Total Surfactants	mg/L	0.5	2
	Chlorinated Pesticides(each)	mg/L	0.0001 ⁽⁷⁾	--
	Phosphorated Pesticides (each)	mg/L	0.0001	0.1
	Total Pesticides (excluding phosphorated pesticides)	mg/L	0.05	0.05
Microbiological parameters	Escherichia coli	UFC/10 0 ml	10 (80% of total samples) ⁽⁸⁾	max 5,000 ⁽⁴⁾
	Acute Toxicity test		--	50% survival ⁽⁵⁾
	Salmonella		Absent ⁽¹⁴⁾	--

Notes:

- (1) For watercourses, the maximum variation from the average temperature of any section upstream or downstream of the discharge point shall not exceed 3°C. On at least half of any downstream section of the discharge point, the variation shall not exceed 1°C.

For lakes, the discharge temperature shall not exceed 30°C, while the temperature increase of the receiving water body shall not exceed 3°C at a distance of 50 meters from the discharge point.

For artificial canals, the maximum average value of water temperature in any section shall not exceed 35°C. This condition is subject to the approval of the canals' administrator.

For sea and outlet zones of non-significant streams, the discharge temperature shall not exceed 35°C, and the temperature increase of the receiving water body shall not exceed 3°C at a distance of 1,000 meters from the discharge point. The environmental compatibility of the discharge with the receiving body shall be ensured, and the formation of thermal barriers shall be avoided at river outlets.

- (2) For urban wastewater discharge limits see Table 4.1 third column.

- (3) The above limits are not valid for discharges to the sea. Inlet areas are comparable to coastal seawaters, provided that on at least half of any section downstream of the discharge, the natural variations of sulfates and chlorides are not altered.
- (4) During the authorization process of the urban wastewater treatment system, the Competent Authority will set the most appropriate limit according to the environmental and hygienic-sanitary conditions of the surface water receptor and according to the existing uses. A limit not exceeding 5,000 UFC/100 ml is advised.
- (5) The toxicity test is mandatory. In addition to the *Daphnia magna* test, an acute toxicity test may be conducted on *Ceriodaphnia dubia*, *Selenastrum capricornutum*, bioluminescent bacteria or organisms such as *Artemia salina*, for salty water discharges or other organisms. If different toxicity tests are performed, the worst result will be considered. The positive result of the toxicity test does not imply the direct application of the sanctions but it requires an in-depth review of the analytical results to determine the origin of the toxicity levels and their subsequent removal.
- (6) Such substance shall be absent from the recovered wastewater dedicated to reuse, according to what set the applicable limits for the wastewater discharge to soil. Such prescription is intended as compliant when the substance is present in a concentration lower than detectable limits of the reference analytic methodologies, still to be defined and updated. In the absence of this definition, the applicable limits are the detectable limits of the table.
- (7) The parameter value is referred to each single pesticide. In case of Aldrin, Dieldrin, Epta chlorine and Epossidic Epta chlorine, the parametric value is 0.030 mu/g/l.
- (8) For the recovered wastewaters coming from lagooning or phyto-depuration the applicable limits are those are 50 UFC/100 ml (80% of samples) and 200 UFC/100 ml (maximum punctual value).
- (9) More stringent limits could be applied by the final depending on process requirements.
- (10) In case of exceedance of threshold limits, the reuse shall be immediately interrupted and could be started again only after the value of the parameter(s) is(are) compliant for the subsequent three consecutive samples
- (11) Reported values may be defined differently at the Regional level I.
- (12) In case of irrigation reuse values for total phosphorus and total nitrogen can be raised to 10 and 35 mg/l respectively.
- (13) In case of irrigation and civil use or chemical physical parameters threshold limits are set for annual average values. In case of irrigation use threshold limits are set for each irrigation campaign. The reuse shall be however immediately interrupted if the value of whichever parameter is > 100% of the threshold limit as for this Table.
- (14) For *Salmonella* parameter the threshold limit is to be referred to 100% of samples. The reuse shall be however immediately interrupted if *Salmonella* is detected.

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C5. CHAPTER 5HAZARDOUS MATERIALC5.1. SCOPE

This Chapter contains standards 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, which are covered under other Chapters. This FGS does not cover munitions, radioactive material, or the transportation of hazardous material.

C5.2. DEFINITIONS

C5.2.1. Compound. A pure chemical consisting of two or more elements that can be separated into simpler substances by chemical reaction.

C5.2.2. Element. A pure chemical consisting of one type of atom.

C5.2.3. EU List of Hazardous Materials. Official list of hazardous materials registered for use in Europe. A copy of the list is provided as Addendum 1.

C5.2.4. Hazardous Chemical Warning Label. A label, tag, or marking on a container that provides the following information:

C5.2.4.1. Identification/name of hazardous chemicals;

C5.2.4.2. Appropriate hazard warnings; and

C5.2.4.3. The name and address of the manufacturer, importer, or other responsible party; and that is prepared in accordance with DoDI 6050.05.

C5.2.5. Hazardous Material. Any substance, compound, mixture or material that is capable of posing an unreasonable risk to health, safety, or the environment if improperly handled, stored, issued, transported, labeled, or disposed because it displays a characteristic listed in Table 5.1., “Typical Hazardous Materials Characteristics,” or the material is listed in Addendum 1, “EU List of Hazardous Materials” or Appendix A, “List of Hazardous Waste Substances & Materials.” Munitions are excluded.

C5.2.6. Hazardous Material Information Resource System (HMIRS). The computer-based information system developed to accumulate, maintain and disseminate important information on hazardous material used by the Department of Defense in accordance with DoDI 6050.05.

C5.2.7. 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 which certification of the shipment is involved.

C5.2.8. Safety Data Sheet (SDS). A form prepared by manufacturers or importers of chemical products to communicate to users the chemical and physical properties and the hazardous effects of a particular product.

C5.2.9. Mixture. A solution of two or more substances.

C5.2.10. Substances. Chemical elements and their compounds in their natural state or obtained by intermediaries, procedures, or production, comprised of additives necessary to maintain the stability of products and the impurities derived from the procedures utilized, but exclusive of solvents that can be eliminated without affecting the stability of the substance and without modifying their composition.

C5.3. CRITERIA

C5.3.1. Storage and handling of hazardous materials will adhere to the DoD Component policies, including Joint Service Publication on Storage and Handling of Hazardous Materials. Defense Logistics Agency Instruction (DLAI) 4145.11, Army Technical Manual (TM) 38-410, Naval Supply Publication (NAVSUP PUB) 573, Air Force Joint Manual (AFJMAN) 23-209, and Marine Corps Order (MCO) 4450.12A, "Storage and Handling of Hazardous Materials" provide additional guidance on the storage and handling of hazardous materials.

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 floor/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 include an SDS;

C5.3.3.2. All drivers are trained 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 paragraph C.5.2.5. and Table 5.1, the shipping papers and briefing for the driver include identification of the material in terms of the nine United Nations (UN) Hazard Classes;

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

C5.3.3.6. Packages are labeled in accordance with paragraph C5.3.7.

C5.3.3.7. Drivers will hold a specific driving license for transport of hazardous materials in accordance with the Joint Transportation and Traffic Management within the EUCOM AOR.

C5.3.4. Each installation will maintain a master listing of all storage locations for hazardous material as well as an inventory of all hazardous materials contained therein. (See paragraph C18.3.2.)

C5.3.5. Each SDS shall be in English or the predominant language in the work place. If local national workers are present in the workplace, the SDS shall also be in Italian. Until an Italian SDS is available, bilingual training will be provided on the contents of the English SDS. Each SDS 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 which has been tested as a whole to determine its hazards, the chemical and common name(s) of the ingredients which 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 which 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 $\geq 1\%$ of the composition, except that chemicals identified as carcinogens shall be listed if the concentrations are $\geq 0.1\%$;

C5.3.5.1.3.2. The chemical and common name(s) of all ingredients which have been determined to be health hazards, and which comprise $< 1\%$ (0.1% 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 which 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 which 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 SDS, 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 which are known to the chemical manufacturer, importer, or employer preparing the SDS, 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 which are known to the chemical manufacturer, importer, or employer preparing the SDS, 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 SDS 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 SDS, 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 SDSs for each hazardous material procured, stored, or used at the work center. SDSs that are not contained in the HMIRS and those SDSs prepared for locally purchased items should be incorporated into the HMIRS. A file of SDS information not contained in the HMIRS should be maintained on site.

C5.3.7. All hazardous material on DoD installations will have a Hazardous Chemical Warning Label in accordance with DoDI 6050.05 (or Italian equivalent) and have SDS information either available or in the HMIRS in accordance with DoDI 6050.05 and other DoD Component instructions. These requirements apply throughout the life-cycle of these materials. All hazardous materials packaging and labels shall be provided in Italian, if Italian workers are present in the workplace.

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 Logistics Agency (DLA) Disposition Services in accordance with the procedures in DoD 4160.21-M,

“Defense Materiel Disposition Manual.” DLA Disposition Services will only donate, transfer, or sell hazardous material to environmentally responsible parties. This paragraph is not intended to prohibit the transfer of usable hazardous material 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 DoDI 6050.05, “DoD Hazard Communication (HAZCOM) Program” and other DoD Component instructions.

C5.3.10.1. Italian employees who use, handle, or store hazardous materials shall also receive training in accordance with Italian requirements. Consult with the Safety and/or Occupational Health Department.

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

C5.3.12. Use of particular substances:

C5.3.12.1. Use of arsenic compounds, and solutions of copper, chromium, arsenic (CCA) type C:

C5.3.12.1.1. The use of arsenic compounds in the preservation of wood is prohibited.

C5.3.12.1.2. With regard to existing uses, wood treated with arsenic compounds that was in use in Italy before 30 September 2007 may remain in place and continue to be used until it reaches the end of its service life.

C5.3.12.1.3. Wood treated with solutions of copper, chromium, arsenic (CCA) type C that was in use in Italy before 30 September 2007 may be used or reused and/or may be placed on the second-hand market subject to certain restrictions.

C5.3.12.2. Use of perfluorooctane sulfonates (PFOS):

C5.3.12.2.1. Use of PFOS-based Fire-fighting foams (e.g., some aqueous film forming foams (AFFF)) that were commercially available in the European Union before 27 December 2006 is prohibited.

C5.3.12.3. Use of nonylphenol, nonylphenol ethoxylate, and cement (with Chromium VI content > 0.0002%):

C5.3.12.3.1. The use of nonylphenol and nonylphenol ethoxylate is prohibited in concentration > 0.1 % in mass for:

C5.3.12.3.1.1. Industrial and civil cleaning activities except for:

C5.3.12.3.1.1.1 Close-loop and controlled dry systems where the washing liquid is recycled or burnt; and

C5.3.12.3.1.1.2 Domestic cleaning.

C5.3.12.3.1.2. Textile and skin treatment;

C5.3.12.3.1.3. Emulsifying agent in agricultural solutions;

C5.3.12.3.1.4. Metal treatment;

C5.3.12.3.1.5. Paper industry;

C5.3.12.3.1.6. Cosmetics;

C5.3.12.3.1.7. Other health care products; and

C5.3.12.3.1.8. Production of pesticides and biocide.

C5.3.12.3.2. The use of cement (once mixed with water) with Chromium VI content > 0.0002% is prohibited.

Table 5.1. Typical Hazardous Materials Characteristics

1. The item is a health or physical hazard. Health hazards include carcinogens, corrosive materials, irritants, mutagens, noxious materials, sensitizers, toxic materials, very toxic materials, materials that are toxic for reproductive activities, materials that damage the skin, eyes, or internal organs, and materials that are hazardous to the environment. Physical hazards include combustible liquids, comburent materials (oxidizing agents), compressed gases, explosives, flammable materials, easily flammable materials, extremely flammable materials, organic peroxides, oxidizers, pyrophoric materials, unstable (reactive) materials and water-reactive materials.

The above-mentioned hazard characteristics are defined as follows:

- a) Explosive substances and mixtures: solid, liquid, pasty or gelatinous substances and mixtures which may also react exothermically without atmospheric oxygen thereby quickly evolving gases, and which, under defined test conditions, detonate, quickly deflagrate or upon heating explode when partially confined;
- b) Oxidizing substances and mixtures: substances and mixtures which give rise to a highly exothermic reaction in contact with other substances, particularly flammable substances;
- c) Extremely flammable substances and mixtures: liquid substances and mixtures having an extremely low flash-point and a low boiling-point and gaseous substances and mixtures which are flammable in contact with air at ambient temperature and pressure (liquids that have a flashpoint $< 0^{\circ}\text{C}$ (32°F) and a boiling point $\leq 35^{\circ}\text{C}$ (95°F); or gases that are flammable in contact with ambient air, excluding liquefied petroleum gases and natural gas; or flammable liquids maintained at a temperature above their boiling point);
- d) Highly flammable substances and mixtures:
 - substances and mixtures which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or
 - solid substances and mixtures which may readily catch fire after brief contact with a source of ignition and which continue to burn or to be consumed after removal of the source of ignition, or
 - liquid substances and mixtures having a very low flash-point, or
 - substances and mixtures which, in contact with water or damp air, evolve highly flammable gases in dangerous quantities
 (may catch fire in contact with air at ambient temperature without any input of energy; or flashpoint $< 21^{\circ}\text{C}$ (70°F) where not classed as extremely flammable);
- e) Flammable substances and mixtures: liquid substances and mixtures having a low flash-point (flashpoint $\geq 21^{\circ}\text{C}$ (70°F) and $\leq 55^{\circ}\text{C}$ (131°F));
- f) Very toxic substances and mixtures: substances and mixtures which in very low quantities cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;
- g) Toxic substances and mixtures: substances and mixtures which in low quantities cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;
- h) Harmful substances and mixtures: substances and mixtures which may cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;
- i) Corrosive substances and mixtures: substances and mixtures which may, on contact with living tissues, destroy them;
- j) Irritant substances and mixtures: non-corrosive substances and mixtures which, through immediate, prolonged or repeated contact with the skin or mucous membrane, may cause inflammation;
- k) Sensitizing substances and mixtures: substances and mixtures which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction of hypersensitization such that on further exposure to the substance or mixtures, characteristic adverse effects are produced;
- l) Carcinogenic substances and mixtures: substances or mixtures which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence;
- m) Mutagenic substances and mixtures: substances and mixtures which, if they are inhaled or ingested or if they penetrate the skin, may induce heritable genetic defects or increase their incidence;
- n) Substances and mixtures which are toxic for reproduction: substances and mixtures which, if they are inhaled or ingested or if they penetrate the skin, may produce, or increase the incidence of, non-heritable

adverse effects in the progeny and/or an impairment of male or female reproductive functions or capacity; o) Substances and mixtures which are dangerous for the environment: substances and mixtures which, were they to enter the environment, would present or may present an immediate or delayed danger for one or more components of the environment.
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 < 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 > 1.0 volt or < -1.0 volt.
6. 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 that, 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

C6.1.1. 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.

C6.1.2. Overview of Waste Classification System

C6.1.2.1. The waste classification system assigns a unique six-digit code to each type of waste (see European List of Wastes provided as Addendum 2). This number identifies a type of waste and must be used in all the documents related to the management of that waste (e.g., shipping, transportation, record-keeping, etc.). This allows installation personnel to identify the type of waste and whether the waste is classified as hazardous.

C6.1.2.2. Waste is classified into two main categories based on its origin: urban or special waste. These two main categories are further subdivided (depending on their degree of hazard) into hazardous and non-hazardous waste. The assignment of waste into its category depends on the origin of the waste. Urban waste is typically generated from household activities or residential areas and street-cleaning activities. Special wastes are generated by any other activity different from household or residential areas (e.g., commercial, handicrafts, industrial, agricultural, etc.). Certain types of special waste that are similar or comparable in nature to urban waste may be disposed of as urban waste if so established by the local Municipality.

C6.1.2.3. Hazardous urban and hazardous special wastes (which includes construction and demolition waste) are addressed in this Chapter. Non-hazardous urban and non-hazardous special wastes are addressed in Chapter 7, "Solid Waste."

C6.1.2.4. Most wastes are classified as hazardous or non-hazardous as indicated in the European List of Wastes (Addendum 2). In general, the generator of a known waste is not required to evaluate the hazardous characteristics to verify if it is hazardous or not; the European List of Wastes provides the classification. However, some wastes may be classified either hazardous or non-hazardous, as a function of chemical-physical characteristics (including waste derived from remediation of contaminated soil, wastewater treatment plant's sludge, spent catalysts, vehicle antifreeze fluids, etc.). In such a case, an analysis is required to assign the proper waste code. In the absence of an analysis, a waste should be considered to be hazardous. Revisions to the European List of Wastes will be maintained by the DoD Lead Environmental Component (LEC). (Classification of unknown wastes will follow the procedure in C6.3.1.)

C6.1.2.5. A complete list of waste categories is provided in the European List of Wastes (Addendum 2).

C6.2. DEFINITIONS

C6.2.1. Acute Hazardous Waste. Those wastes listed in Appendix A, “List of Hazardous Substances & Materials,” with a “P” designator.

C6.2.2. Annual Waste Report (Modello Unico di Dichiarazione Ambientale - MUD). An official statement listing quantity and type of waste generated and disposed of in the previous calendar year.

C6.2.3. Battery or Accumulator. Any source of electrical energy generated by direct conversion of chemical energy and consisting of one or more primary battery cells (non-rechargeable) or consisting of one or more secondary battery cells (rechargeable).

C6.2.3.1. Portable battery or accumulator. Any battery, button cell, battery pack, or accumulator that:

C6.2.3.1.1. Is sealed;

C6.2.3.1.2. Can be hand carried; and

C6.2.3.1.3. Is neither an industrial battery or accumulator nor an automotive battery or accumulator;

C6.2.3.2. Button cell. Any small disc-shaped portable battery or accumulator whose diameter is greater than its height and which is used for special purposes such as hearing aids, watches, small portable equipment, and back-up power.

C6.2.4. Bulky Waste. Refrigerators and freezers, televisions, computers, dishwashing and laundry machines, air conditioners, and any other large-sized waste (i.e., furniture). These comprise both hazardous and non-hazardous waste.

C6.2.5. By-product. All products that are not primary products and have another use or consumption. By-product that can be re-used directly without prior processing or treatment is not considered waste, provided that the characteristics of the by-product are suitable for the specific re-use with no prejudice for human health and/or the environment.

C6.2.6. Collection. The act of consolidating wastes (or materials which have been separated for the purpose of recycling) from various locations.

C6.2.7. Construction and Demolition Waste. A subcategory of special waste that includes hazardous and non-hazardous waste building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings, and other structures.

C6.2.8. Disposal. Any activity listed in Appendix B.2 (e.g., the discharge, deposit, injection, dumping, spilling, leaking, or placing of any waste into or on any land or water that would allow the waste or constituent thereof to enter the environment). Proper disposal effectively mitigates hazards to human health and the environment.

C6.2.9. DLA. Defense Logistics Agency.

C6.2.10. European List of Wastes. A categorical list of wastes and associated classification codes. The waste classification system assigns a unique six-digit code to each type of waste, which must be used on all documents related to the management of that waste (e.g., shipping, transportation, record-keeping, etc.). The list is provided as Addendum 2.

C6.2.11. Hazardous Constituent. A chemical compound that is listed by name in Appendix A, “List of Hazardous Substances & Materials,” or that possesses the characteristics described in Appendix B.1.

C6.2.12. Hazardous Urban Waste. A sub-category of urban waste identified as hazardous in the European List of Wastes or by Municipal authorities that includes:

C6.2.12.1. Mercury, nickel-cadmium, and lithium batteries from household appliances;

C6.2.12.2. Fluorescent lights;

C6.2.12.3. Pesticides;

C6.2.12.4. Photographic chemicals;

C6.2.12.5. Solvents;

C6.2.12.6. Acids;

C6.2.12.7. Discarded equipment containing chlorofluorocarbons;

C6.2.12.8. Non-edible oil and fat;

C6.2.12.9. Paints, inks, adhesives and resins containing hazardous substances;

C6.2.12.10. Detergents containing hazardous substances;

C6.2.12.11. Cytotoxic and cytostatic medicines;

C6.2.12.12. Electrical and electronic equipment;

C6.2.12.13. Wood containing hazardous substances; and

C6.2.12.14. Any container labeled with “T” (toxic) and/or “F” (flammable) sold for private use only (from households).

C6.2.13. Hazardous Waste (HW). Any waste which displays hazardous properties identified in Appendix B.1 and/or is denoted with an asterisk (*) next to the six-digit code in the European List of Wastes (Addendum 2). In Italy, hazardous waste is also referred to as “dangerous waste.”

C6.2.14. Hazardous Waste Accumulation Point (HWAP). A shop, site, or other work center where hazardous wastes are accumulated until removed to a Temporary Waste Storage Area (TWSA) or Waste Storage Area (WSA), or shipped for treatment or disposal. A HWAP may be used to accumulate no more than 208 liters (55 gallons) of hazardous waste or 1 liter (1

quart) of acute hazardous waste, from each waste stream. The HWAP must be at or near the point of waste generation and under the control of the waste producer.

C6.2.15. 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.

C6.2.16. Hazardous Waste Generation. Any act or process that produces hazardous waste (HW) as defined in this FGS.

C6.2.17. Hazardous Waste Log. A listing of hazardous waste deposited and removed from a Temporary Waste Storage Area (TWSA) or Waste Storage Area (WSA). Information such as the waste type, volume, location, and storage removal dates should be recorded. (Note: This is distinct from the Waste Loading and Unloading Register).

C6.2.18. 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 which created the hazardous waste. The DLA Disposition Services Form 1930 is typically used for this purpose. Form 1930 may be modified after coordination with DLA Disposition Services or alternate disposal agent, while ensuring that the content remains the same.

C6.2.19. Landfill. Disposal site for the deposit of waste onto or into land (i.e., underground), including:

C6.2.19.1. Internal waste disposal sites (i.e., a landfill where a generator of waste is carrying out its own waste disposal at the place of production); and

C6.2.19.2. Permanent sites (i.e. operating longer than one year) which are not used for temporary storage of waste, but excluding:

C6.2.19.2.1. Facilities where waste is unloaded in preparation for further transport for recovery, treatment or disposal elsewhere; and

C6.2.19.2.2. Storage of waste prior to recovery or treatment for a period < three years; or

C6.2.19.2.3. Storage of waste prior to disposal for a period < one year.

C6.2.20. Landfill for Hazardous Waste. Landfill specifically designed to accept only hazardous waste (including hazardous waste with a dry-substance content not lower than 25%, hazardous waste whose leachate meets established standards, waste containing or contaminated with PCB in concentration lower than 50 ppm, waste containing or contaminated with dioxins and/or furans in concentration lower than 10 ppb, waste whose Total Organic Compounds concentration for reactive substances is lower than 5%).

C6.2.21. Leachate. Any liquid percolating through the deposited waste and emitted from or contained within a landfill.

C6.2.22. Medical Waste. Refer to Chapter 8, “Medical Waste.”

C6.2.23. National Environmental Managers’ Register (Albo nazionale gestori ambientali). The nationwide register that lists all of the companies that are authorized to conduct waste management activities (including transportation, storage, treatment, recycling, disposal, etc.). The register is divided by Region and is available at the local Chamber of Commerce.

C6.2.24. Non-hazardous Waste. Any waste that is not identified as hazardous by the European List of Wastes (Addendum 2), or presenting one or more hazardous properties and containing constituents in concentrations at or above the thresholds listed in Appendix B.1. The re-classification of hazardous waste to non-hazardous waste cannot be obtained by dilution or mixing with substances resulting in a reduction of the initial concentration of hazardous substances.

C6.2.25. Packaging Materials. Materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods. Items are considered to be packaging even if they may have other functions unless the item is an integral part of the product. Packaging components and ancillary elements integrated into packaging shall be considered to be part of the packaging into which they are integrated; for example labels, staples, plastic sleeves.

C6.2.26. Persistent Organic Pollutants (POPs). Persistent Organic Pollutants are chemical substances that persist in the environment, bio-accumulate through the food web, and pose a risk of causing adverse effects to human health and the environment. This group of priority pollutants consists of pesticides (such as DDT), industrial chemicals (such as polychlorinated biphenyls), and unintentional by-products of industrial processes (such as dioxins and furan) as listed in Appendix B.6.

C6.2.27. POL. Refined petroleum, oils and lubricants, including but not limited to, petroleum, fuel, lubricant oils, synthetic oils, mineral oils, animal fats, vegetable oil, sludge, and POL mixed with wastes other than dredged spoil.

C6.2.28. Scrap Vehicle. A motor vehicle or its parts (including tires) that the owner intends to or is required to dispose of.

C6.2.29. Scrap Vehicle Collection Center. A (authorized) facility for the demolition and reclaiming operations for the crushing of parts of the vehicle being demolished, in order to obtain recyclable pieces of metal, separating them from non-metallic parts for recovery related energy savings, or disposal.

C6.2.30. Sludge. A special waste generated from drinking water or any other water treatment activities, from wastewater treatment activities, and from fumes abatement.

C6.2.31. Special Waste. Special waste includes both non-hazardous and hazardous waste. Non-hazardous special waste is further defined and addressed in Chapter 7, “Solid Waste.” Hazardous wastes are identified in the European List of Wastes (Addendum 2) and/or display the hazardous properties listed in Appendix B.1. The re-classification of hazardous waste to non-hazardous waste cannot be obtained by dilution or mixing with substances resulting in a

reduction of the initial concentration of hazardous substances. Special waste includes any non-urban waste generated by the following activities:

- C6.2.31.1. Waste from agricultural and agricultural-industrial activities;
- C6.2.31.2. Waste from demolition activities, construction, and excavation (see also Construction and Demolition Waste);
- C6.2.31.3. Waste from industrial activities (e.g., paint booth processes);
- C6.2.31.4. Waste from handicraft activities (e.g., Morale, Welfare and Recreation (MWR) hobby shops, car body shops, or wood carpentry shops);
- C6.2.31.5. Waste from commercial activities (e.g., commissaries, car repair shops, etc.);
- C6.2.31.6. Waste from service activities (e.g., offices);
- C6.2.31.7. Waste derived from waste recovery and/or disposal, including sludge;
- C6.2.31.8. Medical waste (e.g., hospitals, veterinary clinics, dental facilities, flightline clinics);
- C6.2.31.9. Tires; and
- C6.2.31.10. Military waste.

C6.2.32. Temporary Waste Storage Area (TWSA). A non-authorized area located within the installation fenceline where temporary waste accumulation and storage activities occur (to include hazardous and non-hazardous waste) before being transferred to a WSA site or picked-up for off-site shipment. Each TWSA must be designated as either volume limited or time limited.

C6.2.33. Transporter. The authorized person, agent, or company who physically transports waste on public roads.

C6.2.34. TWSA/WSA Manager. A person(s) on the installation with the operational responsibility for receiving, storing, inspecting, and generally managing the installation's TWSA/WSA.

C6.2.35. Unique Generator Identification Number. The generator identification is accomplished using the Unique Identification Number assigned by the Italian authorities.

C6.2.36. Unique Identification Number (Codice Fiscale). A unique number that the Italian authorities issue to any citizen, company, or public body (including foreign citizens residing in Italy) doing business or having related activities in Italy. The 16-digit number is required when filing numerous public and private documents.

C6.2.37. Unique Waste Identification Code. The six-digit Waste Code listed in the European List of Wastes that is provided for each waste. This number is used by installations to identify a known waste and to ease the waste management and record-keeping process.

C6.2.38. Urban Waste. Refer to Chapter 7, “Solid Waste.”

C6.2.39. Used Oil. Any oil or other waste POL product (whether mineral or synthetic) that has become unsuitable for the use for which it was initially intended. Used oil includes oil mixtures, oily tank residues, mixtures of oil and water, and emulsions. Used oil (other than used oil burned for energy recovery) is classified as a hazardous waste and will be managed as such.

C6.2.40. 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.

C6.2.41. Waste. Any substance, material, or object that the waste generator (producer) discards, intends to discard, or is required to discard, including material sent for recovery. Waste is classified according to its origin as either urban (municipal) waste or as special waste, and is further sub-classified as hazardous waste or as non-hazardous waste. A complete list of waste streams with the corresponding Waste Code is provided in the European List of Wastes.

C6.2.42. Waste Generation. The act or process of producing waste.

C6.2.43. Waste Generator. A generator is considered to be the person or entity whose processes or actions generate waste.

C6.2.44. Waste Loading and Unloading Register. A specific and dedicated log book, kept at the installation, used to record all waste transfers, which includes all onsite “loading” operations (i.e., data on waste temporarily stored at the site including waste code, amount and date of storage) and all “unloading” operations undertaken at the site (i.e. data on waste shipped off-site for disposal/recovery/recycling, including waste code, amount shipped, date of transport, and name of waste carrier). Waste collected by the municipality is not required to be recorded on this waste register.

C6.2.45. Waste Manifest. A specific form used to track the shipment of special waste from its point of origin to its point of disposal.

C6.2.46. Waste Storage Area (WSA). An authorized area (different than a TWSA) where the storage of waste (both hazardous and/or non-hazardous) occurs prior to disposal through any activity listed in Appendix B.2 or recovery activity listed in Appendix B.3. Special waste may be stored no longer than one year at a WSA unless otherwise specified in the authorization. A WSA site shall be authorized via the Italian Base Commander, in accordance with the procedures established in Chapter 1.

C6.2.47. Waste Treatment. Any method, technique, or process, designed to change the physical, chemical, or biological characteristics or composition of any waste so as to render such waste non-hazardous, or less hazardous to the persons exposed or to the environment; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

C6.3. CRITERIA

C6.3.1. Waste Classification. Waste generating activities will classify their waste streams using the European List of Wastes. Laboratory analysis shall be used to classify unknown wastes by determining their physical-chemical characteristics and their hazardous properties as presented in Appendix B.1.

C6.3.2. Waste Analysis Plan. The TWSA/WSA 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 also include procedures for characterization and verification testing of unknown wastes. The plan should include: parameters for testing and rationale for choosing them, frequency of analysis, test methods, and sampling methods. In addition, waste analyses shall be performed prior to transferring waste to recycling/disposal facilities (at the first shipment and then at least annually and when the waste generating process changes significantly).

C6.3.3. Waste generators shall keep a Waste Loading and Unloading Register in which each waste loading and unloading operation shall be registered with the proper unique waste identification codes from the European List of Wastes. In addition the waste generator shall complete the annual waste report (MUD); see C6.3.6.4.

C6.3.4. Transportation Criteria

C6.3.4.1. When transporting hazardous waste via commercial or military transportation on Italian public roads and highways, HW generators will prepare off-installation HW shipments in compliance with the packaging and labeling requirements of Chapter 5, "Hazardous Material." Requirements may include placarding, marking, containerization, and labeling. Hazardous waste designated for transport will be prepared in accordance with applicable international regulations, Italian regulations, and service-specific instructions.

C6.3.4.2. Hazardous waste transporters shall be registered in Italy and utilize licensed vehicles.

C6.3.4.3. When transporting HW via military vehicle on Italian public roads and highways, generators will ensure compliance with Service regulations for the transport of hazardous materials, and if required by applicable international agreements (Status of Forces Agreement (SOFA), basing, etc.), Italian transportation regulations. Transporters shall be registered in the Italian National Registry of Environmental Managers (Albo Nazionale Gestori Ambientali), unless they collect and transport to the disposal/recycling facility their own hazardous waste in quantities ≤ 30 kg/day or 30 l/day. This criterion does not apply to the movement of hazardous waste within the installation fence line.

C6.3.5. Manifesting Criteria. All waste (municipal and special waste, whether hazardous or non-hazardous) leaving the installation will be accompanied by the waste manifest to ensure a complete audit trail from point of origin to ultimate disposal. (Note: urban waste removed by the Municipal authority with its own vehicles does not have to be manifested.) This manifest should include the following information:

C6.3.5.1. Name, address, and Unique Identification Number of the generator of the waste;

C6.3.5.2. Name, address, and financial code of the waste transporter;

C6.3.5.3. Origin, waste code, and quantity of waste;

C6.3.5.4. Disposal or recovery code to be used (see Appendices B.2 and B.3);

C6.3.5.5. Name of disposal facility;

C6.3.5.6. Date and route to the disposal and/or treatment facility;

C6.3.5.7. Transport vehicle license plate number and driver's name; and

C6.3.5.8. Name and address of the receiver.

C6.3.5.9. The waste manifest shall be completed in quadruplet, all dated and signed by the waste generator and countersigned by the transporter. The waste generator shall retain one copy, and another copy must be returned by the transporter to the waste generator within three months of delivery of the waste to the disposal/treatment facility (or six months for out-of-country disposal). Installations shall notify the Italian Base Commander if the installation does not receive a copy of the manifest from the transporter within three months of the delivery of the waste for in-country disposal (or six months for out-of-country disposal).

C6.3.5.10. Both copies of the waste manifest shall be kept on file for at least five years from the date of shipment. These copies shall be kept physically together with the waste loading and unloading register.

C6.3.6. Record-Keeping Criteria

C6.3.6.1. ID Number.

C6.3.6.1.1. Each generator will use the installation's "Unique Identification Number" for all record-keeping, reports, and manifests for waste. For DoD internal tracking purposes, a separate unique identification number may also be used.

C6.3.6.2. Each generator will use the European List of Wastes (Addendum 2) to assign each waste a unique waste identification code. This unique waste identification code shall be used in all reporting, manifesting, and record-keeping.

C6.3.6.3. Audit Trail. Generators will maintain an audit trail of HW from the point of generation to disposal. Generators using DLA Disposition Services will obtain a signed copy of the manifest from the initial DLA Disposition Services recipient of the waste, at which time DLA Disposition Services 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), 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.

C6.3.6.4. MUD Report (Annual Waste Report). An annual declaration of the waste generated during the previous year shall be submitted to the Italian Base Commander (see Chapter 1 for the process).

C6.3.6.5. Turn-In Documents. Turn-in documents [(e.g., waste manifests) and DD Form 1348-1A] must be maintained for five years.

C6.3.6.6. Hazardous Waste Log. A written log will be maintained for each TWSA and/or WSA. The log shall include the following:

- C6.3.6.6.1. Name/address of generator;
- C6.3.6.6.2. Description and hazard class of the hazardous waste;
- C6.3.6.6.3. Number and types of containers;
- C6.3.6.6.4. Quantity of hazardous waste;
- C6.3.6.6.5. Date stored;
- C6.3.6.6.6. Storage location; and
- C6.3.6.6.7. Disposition data, to include: dates received, sealed, and transported and transporter used.

C6.3.6.7. Waste Loading and Unloading Register. In addition to the various waste logs to be maintained for each TWSA and/or WSA, a Waste Loading and Unloading Register shall be maintained at each installation for both hazardous and non-hazardous waste. The waste register shall be used to record all manifested waste generated and shipped off base; entries shall be made within 10 business days from the generation/shipment operation. The waste loading and unloading register will be retained for five years after the date of its last entry, and will have the two signed copies of the waste manifest attached. More than one register can be present at each installation, as long as there are no duplicate entries.

C6.3.6.8. Availability of Hazardous Waste Log. 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.

C6.3.6.9. Inspection Logs. Records of inspection logs shall be maintained for a period of 3 five years.

C6.3.6.10. Manifests. Manifests of incoming and outgoing hazardous wastes, including medical waste, will be retained for a period of five years. Two signed copies of the waste manifest shall be retained together with the Loading and Unloading Register (see C6.3.6.7).

C6.3.6.11. Waste Analysis/Characterization Records. Records of waste analysis/characterization shall be maintained for a period of five years.

C6.3.6.12. Waste Records. Installation will maintain records, identified in C6.3.6., for all waste streams generated on the installation.

C6.3.7. Training Criteria

C6.3.7.1. Personnel Training. Personnel assigned duty at a HWAP, TWSA and/or WSA must successfully complete appropriate HW 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 paragraph C6.3.7.4.

C6.3.7.2. Application. Personnel and their supervisors who are assigned duties involving actual or potential exposure to HW must successfully complete an appropriate training program prior to assuming those duties. Personnel assigned to such duty after the effective date of this document must work under direct supervision until they have completed appropriate training. Additional guidance is contained in DoDI 6050.05 (DoD Hazard Communication Program).

C6.3.7.3. Refresher Training. All personnel performing HW duties must successfully complete annual HW refresher training.

C6.3.7.4. Training Contents and Requirements. The training program must:

C6.3.7.4.1. Include sufficient information to enable personnel to perform their assigned duties and fully comply with pertinent HW requirements.

C6.3.7.4.2. Be conducted by qualified trainers who have completed an instructor training program in the subject, have comparable academic credentials, or experience.

C6.3.7.4.3. 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.

C6.3.7.4.4. Address the following areas in particular for personnel whose duties include hazardous waste handling and management:

C6.3.7.4.4.1. Emergency procedures (response to fire/explosion/spills; use of communications/alarm systems; body and equipment clean-up);

C6.3.7.4.4.2. Drum/container handling/storage; safe use of HW equipment; proper sampling procedures;

C6.3.7.4.4.3. Employee Protection. Personal Protective Equipment (PPE), safety and health hazards, hazard communication, and worker exposure; and

C6.3.7.4.4.4. Record-Keeping. Record-keeping, security, inspections, contingency plans, storage requirements, and transportation requirements.

C6.3.7.4.5. Training shall be provided in Italian if HW handling duties are assigned to non-English speaking Italian personnel.

C6.3.7.5. Documentation of Training. Installations must document all HW training for each individual assigned duties involving actual or potential exposure to HW. Updated training records on personnel assigned duties involving actual or potential exposure to HW must be kept by the TWSA/WSA manager or the responsible installation office and retained for at least three years after termination of duty of these personnel.

C6.3.8. Hazardous Waste Management

C6.3.8.1. Segregation of Waste. Hazardous waste will be segregated by waste stream at its point of origin and while in storage (either at the HWAP, TWSA, or WSA). Hazardous waste will also be segregated from non-hazardous waste.

C6.3.8.2. Construction & Demolition Waste. Hazardous construction/demolition waste shall be disposed of in authorized landfills for hazardous waste.

C6.3.8.3. Waste Analysis & Verification

C6.3.8.3.1. Hazardous Waste Profile Sheet (HWPS). A 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 classification of the hazardous waste being handled at the storage area.

C6.3.8.3.2. Maintenance of Waste Analysis File. The TWSAs and/or WSAs must have, and keep on file, a HWPS for each hazardous waste stream that is stored at each TWSA and/or WSA.

C6.3.8.3.3. Waste Verification. Generating activities will provide identification of incoming hazardous waste on the HWPS to the TWSA and/or WSA manager. Prior to accepting the waste, the TWSA and/or WSA manager will:

C6.3.8.3.3.1. Inspect the waste to ensure it matches the description provided.

C6.3.8.3.3.2. Ensure that no waste is accepted for storage unless an HWPS is provided, or is available and properly referenced.

C6.3.8.3.3.3. Request a new HWPS from the generator if there is reason to believe that the process generating the waste has changed;

C6.3.8.3.3.4. 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

C6.3.8.3.3.5. Reject shipments that do not match the accompanying waste descriptions unless the generator provides an accurate description.

C6.3.9. Use and Management of Containers

C6.3.9.1. Container Handling & Storage. To protect human health and the environment, the following guidelines will apply when handling and storing hazardous waste containers:

C6.3.9.1.1. Containers holding hazardous waste will be in good condition, free from severe rusting, bulging, or structural defects.

C6.3.9.1.2. Containers used to store hazardous waste, including overpack containers, must be compatible with the materials stored.

C6.3.9.1.3. Storage containers previously used for hazardous waste shall not be used to store food products.

C6.3.9.1.4. A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.

C6.3.9.1.5. 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.

C6.3.9.1.6. Containers of flammable liquids must be grounded when transferring flammable liquids from one container to the other.

C6.3.9.1.7. Containers holding hazardous waste will be marked with a hazardous waste marking, and a label indicating the hazard class of the waste contained (flammable, corrosive, etc.) as applicable.

C6.3.9.1.8. Areas where containers of hazardous waste are stored must be inspected weekly for leaking containers and deteriorating containers as well as 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.

C6.3.9.1.9. Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material. Containers that have been used for temporary storage of hazardous waste, and that will not be re-used for the same type of waste, shall be properly decontaminated before further utilization.

C6.3.9.2. Containment. HWAPs, TWSAs, and WSAs containing hazardous waste must have a secondary containment system meeting the following:

C6.3.9.2.1. Must be sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed.

C6.3.9.2.2. The secondary containment system must have sufficient capacity to contain one-third of the total capacity of stored containers or the volume of the largest container, whichever is greater.

C6.3.9.2.3. Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system as described in C6.3.9.2.1., 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.

C6.3.9.2.4. 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.

C6.3.9.2.5. 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.

C6.3.9.3. Hazardous Waste Accumulation Points (HWAPs)

C6.3.9.3.1. Each HWAP must be designed and operated to provide appropriate segregation for different hazardous waste streams, including those that 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.

C6.3.9.3.2. A HWAP will comply with the storage limits in the definitions. When these limits have been reached, the generator will make arrangements within five working days to move the HW to a TWSA or WSA 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 1348-1A) to appropriate authorities responsible for removing the HW (e.g., DLA Disposition Services). Wastes intended to be recycled or used for energy recovery (e.g., used oil or antifreeze) are exempt from the 208-liter (55-gallons)/1-liter (1-quart) volume accumulation limits, but must be transported off-site to a final destination facility within one year.

C6.3.9.3.3. To initiate the removal of waste, the generating activity shall submit all appropriate turn-in documents (e.g., DD 1348-1A) to appropriate authorities responsible for removing the HW (e.g., DLA Disposition Services).

C6.3.9.3.4. All criteria of C6.3.9.1 (Container Storage & Handling) and C6.3.9.2. (Containment) apply to HWAPs with the exception of C6.3.9.1.8.

C6.3.9.3.5. Waste transfers from a HWAP to a TWSA or WSA shall be recorded in the TWSA or WSA log book, on a DD 1348, or other appropriate document. The HWAP does not need to maintain a waste log.

C6.3.9.4. Temporary Waste Storage Area (TWSA)

C6.3.9.4.1. TWSAs must be designed and operated to provide appropriate segregation for different waste streams, including those that are chemically incompatible. A TWSA does not need authorization as long as the following conditions are met:

C6.3.9.4.1.1. The waste shall not contain polychlorodibenzodioxines and/or polychlorodibenzofurans and polychlorodibenzophenols ≥ 2.5 ppm, nor PCBs and/or PCTs ≥ 25 ppm. The waste containing Persistent Organic Pollutants (POPs) listed in Appendix B.6 shall be managed in compliance with technical standards governing the storage and packaging of hazardous substances (please refer to Chapter 5, “Hazardous Material”).

C6.3.9.4.1.2. DoD installations shall select and indicate in their management plan one of the following two methods for managing hazardous waste temporarily stored in all the TWSAs within its physical boundaries:

C6.3.9.4.1.2.1 The volume of the hazardous waste shall not exceed 10 m^3 (353.14 ft^3 or 2,641 gallons) at any one time and waste may not be stored for more than one year; or

C6.3.9.4.1.2.2 The temporary storage of the hazardous waste shall not exceed three months (irrespective of the volume of waste stored). The duration may be extended to one year if the temporary deposit is located on a small island.

C6.3.9.4.1.2.3 The temporary storage of waste shall ensure the segregation of waste types with respect to technical-military standards and standards governing the management of the dangerous substances contained in the waste.

C6.3.9.4.1.2.4 Military waste as defined in the list for Special Waste and waste originating from military vessels and installations supporting military defense and national security cannot be held in a TWSA more than 12 months, regardless of the quantity.

C6.3.9.4.1.3. Each TWSA will have warning signs (appropriate Italian or international signs, or National Fire Protection Association signs) appropriate for the waste being accumulated at that site.

C6.3.9.4.2. When storage limits in C6.3.9.4.1.2.1. have been reached, the generator must have the waste removed for disposal or moved to a WSA. To initiate the waste removal, installations must submit all appropriate turn-in documents (e.g., DD Form 1348-1A) to appropriate DoD authorities responsible for removing the special waste (e.g., DLA Disposition Services) or prepare the waste manifest when using an Italian-authorized company.

C6.3.9.5. Waste Storage Area (WSA)

C6.3.9.5.1. Waste Acceptance. Prior to accepting hazardous special waste, the WSA manager shall:

C6.3.9.5.1.1. Inspect the waste to ensure it matches the description provided

C6.3.9.5.1.2. Ensure that no waste is accepted for storage unless a HWPS is provided, or available and properly referenced

C6.3.9.5.1.3. Obtain a new HWPS from the generator if there is reason to believe that the process generating the waste has changed

C6.3.9.5.1.4. Reject shipments that do not match the accompanying waste descriptions unless the generator provides an accurate description

C6.3.9.5.2. Installations shall notify the Italian Base Commander prior to operation of a WSA where an authorization for storage does not already exist (see Chapter 1 for the process).

C6.3.9.5.3. Hazardous waste shall not be stored longer than one year in a WSA.

C6.3.9.6. Requirements for TWSAs and WSAs

C6.3.9.6.1. Location Standards. To the maximum extent possible, all TWSAs and WSAs 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.

C6.3.9.6.2. Design & Operation of TWSAs and WSAs. TWSAs and WSAs must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned release of HW or HW constituents to air, soil, groundwater or surface water that could threaten human health or the environment.

C6.3.9.6.3. Security

C6.3.9.6.3.1. General. The installation must prevent the unknowing entry, and minimize the possibility for unauthorized entry (of persons or livestock) onto the TWSAs and/or WSAs.

C6.3.9.6.3.2. Security System Design. An acceptable security system for a TWSA and/or WSA consists of either:

C6.3.9.6.3.2.1 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 TWSA and/or WSA; or

C6.3.9.6.3.2.2 An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff) that completely surrounds the TWSA and/or WSA, combined with a means to control entrance at all times (e.g., an attendant, television monitors, locked gate, or controlled roadway access).

C6.3.9.6.3.3. Required Signs. A sign with the legend "Danger - Unauthorized Personnel Keep Out," must be posted at each entrance to the TWSA and/or WSA, and at other locations, in sufficient numbers to be seen from any approach to the TWSA and/or WSA. 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 TWSA and/or WSA, and that entry can be dangerous.

C6.3.9.6.4. 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.

C6.3.9.6.5. Access to Communications or Alarm System

C6.3.9.6.5.1. General. Whenever HW 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.

C6.3.9.6.5.2. If there is only one person on duty at the TWSA and/or WSA, 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.

C6.3.9.6.6. Required Equipment. All TWSAs and/or WSAs must be equipped with the following:

C6.3.9.6.6.1. An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to TWSA and/or WSA personnel.

C6.3.9.6.6.2. 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.

C6.3.9.6.6.3. 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.

C6.3.9.6.6.4. Water at adequate volume and pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems.

C6.3.9.6.6.5. Readily available personal protective equipment (appropriate to the materials stored), eyewash, and shower facilities.

C6.3.9.6.6.6. Testing and Maintenance of Equipment. All TWSAs and/or WSAs 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.

C6.3.9.6.7. General Inspection Requirements

C6.3.9.6.7.1. General. The installation must inspect the TWSAs and/or WSAs for malfunctions and deterioration, operator errors, and discharges that may be causing, or may lead to, a release of HW 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.

C6.3.9.6.7.2. Types of Equipment Covered. Inspections must include all equipment and areas involved in storage and handling of HW, 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.

C6.3.9.6.7.3. Inspection Schedule. Inspections must be conducted according to a written schedule that is kept at the TWSA and/or WSA. 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, or eroding dike).

C6.3.9.6.7.4. Frequency of Inspections. Minimum frequencies for inspecting containers and container storage areas are found in C6.3.9.1.8. Minimum frequencies for inspecting tank systems are found in C6.3.9.5.2. For equipment not covered by those sections, the 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.

C6.3.9.6.7.5. Remedy of Problems Identified 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.

C6.3.9.6.7.6. Maintenance of Inspection Records. The installation must record inspections in an inspection log or summary, and keep these records for at least five 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.

C6.3.9.6.8. Storage Practices

C6.3.9.6.8.1. 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, and explosion, and generation of toxic gases.

C6.3.9.6.8.2. General Requirements for Ignitable, Reactive, or Incompatible Wastes. The TWSA and/or WSA 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 TWSA and/or WSA 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, Italian, and in any other language predominant in the area. Water-reactive waste cannot be stored in the same area as flammable and combustible liquid.

C6.3.9.6.9. Closure and Closure Plans

C6.3.9.6.9.1. Closure. At closure of a TWSA and or WSA, HW and HW 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 HW and according to the Closure Plan.

C6.3.9.6.9.2. Closure Plan. Closure plans will be developed before a new TWSA and/or WSA is opened. A closure plan will be developed for each existing TWSA and/or WSA. The closure plan will be implemented concurrent with the decision to close the TWSA and/or WSA. The closure plan will include: estimates of the storage capacity of HW, steps to be taken to remove or decontaminate all waste residues, and estimate of the expected date for closure.

C6.3.9.7. Additional Requirements for Ignitable, Reactive, or Incompatible Wastes

C6.3.9.7.1. 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.

C6.3.9.7.2. Special Requirements for Incompatible Wastes. Incompatible wastes and materials must not be placed in the same container.

C6.3.9.8. Contingency Plan

C6.3.9.8.1. Each installation will have a contingency plan that describes actions to be taken to contain and clean up spills and releases of HW in accordance with the provisions of Chapter 18, "Spill Prevention & Response Planning."

C6.3.9.8.2. Copies of Contingency Plan. A current copy of the installation contingency plan must be:

C6.3.9.8.2.1. Maintained at each HWAP, TWSA and/or WSA (HWAPs need maintain only portions of the contingency plan that are pertinent to their facilities and operation); and

C6.3.9.8.2.2. 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, including appropriate references to the Workplace Risk Evaluation (see Chapter 5, "Hazardous Material"), should be available in both English and Italian.

C6.3.9.9. Tank Systems. The following criteria apply to all storage tanks containing HW. See Chapter 19 "Underground Storage Tanks," for criteria dealing with underground storage tanks (USTs) containing petroleum, oil, and lubricants (POL) and hazardous substances.

C6.3.9.9.1. Application. The requirements of this section apply to TWSAs and/or WSAs that use tank systems for storing or treating HW. Tank systems that are used to store or treat HW that contains no free liquids and are situated inside a building with an impermeable floor are exempted from the requirements in C6.3.9.9.4 (Containment and Detection of Releases). Tank systems, including sumps, that serve as part of a secondary containment system to collect or contain releases of HW, are exempted from the requirements in C6.3.9.9.4.

C6.3.9.9.2. Assessment of the Integrity of an Existing Tank System. For each existing tank system that does not have secondary containment meeting the requirements of subparagraph C6.3.9.9.4, installations must determine annually whether the tank system is leaking or is fit for use. Tightness tests for UST systems shall be conducted according to the schedule specified in Chapter 19, "Underground Storage Tanks." Installations must obtain, and keep on file at the TWSA and/or WSA, a written assessment of UST-system integrity reviewed and certified by a competent authority.

C6.3.9.9.3. Design and Installation of New Tank Systems or Components. Managers of TWSAs and/or WSAs 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.

C6.3.9.9.4. Containment and Detection of Releases. To prevent the release of HW or hazardous constituents to the environment, secondary containment that meets the requirements of this subparagraph must be:

C6.3.9.9.4.1. Provided for all new tank systems or components, prior to their being put into service;

C6.3.9.9.4.2. Provided for those existing tank systems when the tank system annual leak test detects leakage;

C6.3.9.9.4.3. Provided for tank systems that store or treat HW by 1 January 1999;

C6.3.9.9.4.4. Provided for above-ground storage tank (AST) used for hazardous waste storage. Each containment system shall meet the larger of the following volumes:

C6.3.9.9.4.4.1 Equal to the volume of the largest AST plus sufficient freeboard to allow for precipitation and expansion of product; and

C6.3.9.9.4.4.2 Equal to one-third of the total capacity stored in the ASTs in the containment system.

C6.3.9.9.4.5. 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

C6.3.9.9.4.6. Constructed to include one or more of the following: a liner external to the tank, a vault, or double-walled tank.

C6.3.9.9.5. General Operating Requirements

C6.3.9.9.5.1. 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.

C6.3.9.9.5.2. The installation must inspect and log at least once each operating day:

C6.3.9.9.5.2.1 The above-ground portions of the tank system, if any, to detect corrosion or releases of waste;

C6.3.9.9.5.2.2 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

C6.3.9.9.5.2.3 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).

C6.3.9.9.5.3. 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 six 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 TWSA and/or WSA site.

C6.3.9.9.6. 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 which is unfit for use, must be removed from service immediately and repaired or closed. Installations must satisfy the following requirements:

C6.3.9.9.6.1. 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.

C6.3.9.9.6.2. Containment of visible releases to the environment. The installation must immediately conduct an inspection of the release and, based upon that inspection:

C6.3.9.9.6.2.1 Prevent further migration of the leak or spill to soils or surface water

C6.3.9.9.6.2.2 Remove and properly dispose of any contamination of the soil or surface water

C6.3.9.9.6.2.3 Remove free product to the maximum extent possible

C6.3.9.9.6.2.4 Continue monitoring and mitigating for any additional fire and safety hazards posed by vapors or free products in subsurface structures

C6.3.9.9.6.3. Make required notifications and reports.

C6.3.9.9.7. Closure. At closure of a tank system, the installation must remove or decontaminate HW residues, contaminated containment system components (liners, etc.), contaminated soils to the extent practicable, and structures and equipment.

C6.3.9.10. Hazardous Waste Disposal

C6.3.9.10.1. Use of DLA Disposition Services. All DoD HW should normally be disposed of through DLA Disposition Services. A decision not to use DLA Disposition Services for HW disposal may be made in accordance with DoDD 4001.1 to best accomplish the installation mission, but should be concurred with by the component chain of command to ensure that installation contracts and disposal criteria are at least as protective as criteria used by DLA Disposition Services.

C6.3.9.10.2. In-Country & Out-of-Country Disposal. Installations and components shall use Italian-authorized companies to treat or dispose of their specific waste.

C6.3.9.10.2.1. When HW cannot be disposed of in accordance with this FGS within Italy, it will either be retrograded to the United States or, if permissible under international agreements, transferred to another country outside the United States where it can be disposed of in an environmentally sound manner and in compliance with FGS applicable to the country of disposal, if any exist. Transshipment of HW to a country other than the United States for disposal must be approved by, at a minimum, the DUSD(I&E) (Note: delegated to DLA Disposition Services on 25 May 1995).

C6.3.9.10.3. Recycling & Reuse Options. 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.

C6.3.9.10.3.1. Installations shall utilize Italian consortiums, when required, to recycle/recover hazardous waste. DLA Disposition Services will assist the installations in identifying those Italian consortiums that are required to accept and recycle/recover selected waste streams (e.g., consortium for lead-acid battery recycling, consortium for used lubricant oil recycling, etc.).

C6.3.9.10.4. Incinerator Standards. This subparagraph applies to incinerators that incinerate HW as well as boilers and industrial furnaces that burn HW for any recycling purposes.

C6.3.9.10.4.1. All incinerators used to dispose of HW must be authorized. DoD installations that intend to operate on-base incinerators and must provide the Italian Base Commander with sufficient information to seek authorization of their incinerator (see Chapter 1 for the process). DoD facilities must consult with the DoD LEC prior to notifying the Italian Base Commander.

C6.3.9.10.4.2. A license, authorization, or DoD LEC approval for incineration of HW 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) to effectively destroy hazardous constituents and control harmful emissions. An authorization, licensing, or approval scheme that would require an incinerator to achieve the standards set forth in either subparagraphs C6.3.9.10.4.2.1. or C6.3.9.10.4.2.2. is acceptable.

C6.3.9.10.4.2.1. The incinerator achieves a destruction and removal efficiency of 99.99% 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 of particulate matter, and emit no more than 1.8 kg (4 pounds) of hydrogen chloride per hour.

C6.3.9.10.4.2.2. The incinerator has demonstrated, as a condition for obtaining a license, authorization, or DoD LEC 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 Italian authority or the DoD LEC to conclude that the incinerator will effectively destroy the principal organic hazardous constituents of each waste to be burned.

C6.3.9.10.5. All hazardous waste treatment (disposal, recycling, recovery, etc.) shall be authorized (see C6.3.9.10.4.1). Authorizations are granted for specific types of wastes and treatments. A simplified authorization can be obtained for the waste recovery activities listed in Appendix B.5. DoD waste generators who intend to treat their hazardous waste on their installation shall consult with the DoD LEC (via the Component chain of command) and shall provide the Italian Base Commander with sufficient information to seek authorization for the treatment activity. A simplified authorization can be obtained for the waste recovery activities listed in Appendix B.5.

C6.3.9.10.5.1. Waste containing POPs shall be disposed of or recovered using the following options (included in Appendix B.2 and B.3):

C6.3.9.10.5.1.1. D9 - Physico-chemical treatment;

C6.3.9.10.5.1.2. D10 - Incineration on land;

C6.3.9.10.5.1.3. R1 - Use principally as a fuel or other means to generate energy, excluding waste containing PCBs; or

C6.3.9.10.5.1.4. R4 - Recycling/reclamation of metals and metal compounds, under the following conditions:

6.3.9.10.5.1.4.1 The operations are restricted to residues from iron- and steel-making processes such as dusts or sludge from gas treatment or mill scale or zinc-containing filter dusts from steelworks, dusts from gas cleaning systems of copper smelters and similar wastes and lead-containing leaching residues of the non-ferrous metal production. Waste containing PCBs is excluded. The operations are restricted to processes for the recovery of iron and iron alloys (blast furnace, shaft furnace and hearth furnace) and non-ferrous metals (Waelz rotary kiln process, bath melting processes using vertical or horizontal furnaces).

6.3.9.10.5.1.4.2 Pre-treatment prior to destruction or irreversible transformation may be performed, provided that a substance listed in Appendix B.6 that is isolated from the waste during the pre-treatment is subsequently disposed using the above listed operations. In addition, repackaging and temporary storage operations may be performed prior to such pre-treatment or prior to destruction or irreversible transformation.

6.3.9.10.5.1.4.3 Waste containing any substances listed in Appendix B.6 may be otherwise disposed with other waste operations listed in Appendix B.2 and B.3, provided that the content of the listed substances in the waste is below the concentration limits specified in Appendix B.6.

C6.3.9.11. Scrap Vehicles, Tires, & Other Car Parts

C6.3.9.11.1. Vehicles that are no longer usable and need to be dismantled shall be turned over to an authorized collection center. Motor vehicles may also be returned to the new (or used) vehicle dealer, when purchasing a new (or replacement) vehicle on the open market. The collection center is responsible for dismantling the vehicle, recovering of recyclable materials, and disposing of the scrap metal. In addition, the collection center will issue a certificate to the former vehicle owner releasing him/her from any penal or civil liability relating to the disposal of the vehicle. Vehicle spare parts (including tires, but excluding parts related to vehicle safety) can also be collected at the centers and sold on the open market, or disposed of as hazardous/non-hazardous waste, according to classification indicated in the European List of Wastes. Vehicle repair facilities shall consign directly to a collection center registered with the National registry, or to an operator authorized to collect and transport waste, regarding the used pieces that are waste resulting from the repair of vehicles.

C6.3.9.11.2. Scrap vehicle collection centers shall be authorized (in most cases, scrap vehicles are classified as hazardous waste and are therefore subject to the hazardous waste storage restrictions in the FGS). A DoD installation that intends to operate a scrap vehicle collection center shall provide the Italian Base Commander with sufficient information to seek authorization (see Chapter 1 for the process).

C6.3.9.12. Criteria for Batteries

C6.3.9.12.1. Lead Acid Batteries. Lead-acid batteries shall be managed as HW and shall be transferred (with other lead wastes) to the appropriate Italian mandatory consortium or authorized agent companies for the collection and recycling of used lead-acid batteries.

C6.3.9.12.2. Mercury, Nickel-Cadmium, & Lithium Batteries. The following classifications of these batteries shall be turned over to authorized members of the consortium for hazardous batteries:

C6.3.9.12.2.1. Mercury batteries or accumulators containing more than 0.0005% of mercury by weight (except for button batteries with a mercury level < 2% of weight);

C6.3.9.12.2.2. Portable batteries or accumulators including those incorporated into equipment, containing more than 0.0002% of cadmium by weight, except for batteries and accumulators intended for use in:

C6.3.9.12.2.2.1. Emergency systems and alarms, including emergency lights;

C6.3.9.12.2.2.2. Medical equipment; and

C6.3.9.12.2.2.3. Cordless electric utensils.

C6.3.9.12.2.3. In addition, nickel-cadmium and lithium batteries shall be turned over to authorized members of the consortium for hazardous batteries. Installations will follow the appropriate manifesting and record-keeping criteria when transferring the waste batteries to the consortium.

C6.3.9.13. Standards for the Management of Used Oil

C6.3.9.13.1. Used Oil Burned for Energy Recovery. Used oil fuel generated directly by the installation may be burned for energy recovery only in the following devices located within the boundary of the installation. This activity requires authorization. Installations that intend to burn used oil generated at their installation for energy recovery shall provide the Italian Base Commander with sufficient information to seek authorization (see Chapter 1 for the process).

C6.3.9.13.1.1. Industrial furnaces.

C6.3.9.13.1.2. Boilers that are identified as follows:

C6.3.9.13.1.2.1. Industrial boilers with a thermal capacity ≥ 6 MW (20.48 million Btu/hr) 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;

C6.3.9.13.1.2.2. Utility boilers with a thermal capacity ≥ 6 MW (20.48 million Btu/hr) used to produce electric power, steam, or heated or cooled air, or other gases or fluids;

C6.3.9.13.1.3. Used oil shall not be used as a fuel supplement in boilers/thermal plants with a thermal capacity < 6 MW (20.48 million Btu/hr). Combustion of used oils containing PCBs and PCTs in concentrations ≥ 25 ppm is prohibited. The maximum emission limits for the following substances shall be met using the testing methodologies and frequencies established in the site-specific authorization:

Parameter	Maximum Emission Limit (as mg/m^3)
Cd	0.2
Ni	1
Cr^{VI}	1
Cu	5
Cl	30
F	5

Note: see Chapter 2, “Air Emissions” for more information

C6.3.9.13.1.4. To ensure proper handling and segregation from hazardous waste, used oil fuel intended for energy recovery shall be labeled with the words “used oil fuel for energy recovery.”

C6.3.9.13.2. Prohibitions on Dust Suppression or Road Treatment. Used oil, hazardous waste, or used oil contaminated with any HW will not be used for dust suppression or road treatment.

C6.3.9.13.3. Use of the Italian Mandatory Consortium for Used Oil. Used oil management, transportation, and disposal for all used oil other than used oil fuel (burned for energy recovery within the DoD installation; see C6.3.9.13.1) shall follow the hazardous waste storage, handling, and record-keeping criteria in this Chapter. Waste lubricant oil shall be transferred to the appropriate Italian mandatory consortium or its authorized agent companies for the collection and recycling of used lubricant oil.

C6.3.9.13.4. Store used oil in a manner that prevents mixing it with new oil, hazardous waste, and/or other substances.

C7. CHAPTER 7

SOLID WASTE

C7.1. SCOPE

C7.1.1. 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 DoDI 4715.4, "Pollution Prevention," 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 11, "Pesticides," Chapter 14, "Polychlorinated Biphenyls," Chapter 15, "Asbestos," and Chapter 17, "Lead-Based Paint."

C7.1.2. Overview of Waste Classification System

C7.1.2.1. The waste classification system assigns a unique six-digit code to each type of waste (see the European List of Wastes [Addendum 2]). This number identifies a type of waste and must be used in all the documents related to the management of that waste (e.g., shipping, transportation, record-keeping, etc.). This allows installation personnel to identify the type of waste and whether the waste is classified as hazardous.

C7.1.2.2. Waste is classified into two main categories based on its origin: urban or special waste. These two main categories are further subdivided (depending on their degree of hazard) into hazardous and non-hazardous waste. The assignment of waste into its category depends on the origin of the waste. Urban waste is typically generated from household activities or residential areas and street-cleaning activities. Special wastes are generated by any other activity different from household or residential areas (e.g., commercial, handicrafts, industrial, agricultural, etc.). Certain types of special waste that are similar or comparable in nature to urban waste may be disposed of as urban waste if so established by the local Municipality.

C7.1.2.3. Urban and special wastes are addressed in this Chapter.

C7.1.2.4. Most wastes are classified as hazardous or non-hazardous as indicated in the European List of Wastes (Addendum 2). In general, the generator of a known waste is not required to evaluate the hazardous characteristics to verify if it is hazardous or not; the European List of Wastes provides the classification. However, some wastes may be classified either hazardous or non-hazardous, as a function of chemical-physical characteristics (including waste derived from remediation of contaminated soil, wastewater treatment plant's sludge, spent catalysts, vehicle antifreeze fluids, etc.). In such a case, an analysis is required to assign the proper waste code. In the absence of an analysis, a waste should be considered to be hazardous. Revisions to the European List of Wastes (Addendum 2) will be maintained by the DoD Lead

Environmental Component (LEC). (Classification of unknown wastes will follow the procedure in C7.3.1.)

C7.1.2.5. A complete list of waste categories is provided in the European List of Wastes (Addendum 2).

C7.2. DEFINITIONS

C7.2.1. Annual Waste Report (Modello Unico di Dichiarazione Ambientale -MUD). An official statement listing quantity and type of waste generated and disposed of in the previous calendar year.

C7.2.2. Bulky Waste. Refrigerators and freezers, televisions, computers, dishwashing and laundry machines, air conditioners, and any other large-sized waste (i.e., furniture). These comprise both hazardous and non-hazardous waste.

C7.2.3. By-product. All products that are not primary products and have another use or consumption. By-product that can be re-used directly without prior processing or treatment is not considered waste, provided that the characteristics of the by-product are suitable for the specific re-use with no prejudice for human health and/or the environment.

C7.2.4. Collection. The act of consolidating wastes (or materials which have been separated for the purpose of recycling) from various locations.

C7.2.5. Commercial Urban Waste. Non-hazardous waste derived from locations and facilities other than housing units (with the exclusion of industrial activities) that is classified by the Municipalities as urban waste. Examples of acceptable classification as commercial urban waste include scrap paper from offices and food waste from restaurants. Examples of unacceptable classification include used toner cartridges from laser printers and photocopying machines or empty paint cans from a warehouse. See Urban Waste.

C7.2.6. Construction and Demolition Waste. A subcategory of special waste that includes waste building materials, packaging, and rubble resulting from construction, remodeling, repair, and demolition operations on pavements, houses, commercial buildings, and other structures.

C7.2.7. Cooking Oils and Grease Waste. Non-hazardous special waste generated by activities like installation exchanges, dining halls, schools, hospitals, restaurants, and other similar public services. The definition does not include waste generated by households.

C7.2.8. Disposal. Any activity listed in Appendix B.2 (e.g., the discharge, deposit, injection, etc. of any waste into or on land so that the waste or constituent thereof may enter the environment). Proper disposal effectively mitigates hazards to human health and the environment.

C7.2.9. DLA. Defense Logistics Agency Disposition Services.

C7.2.10. Food Waste. The organic residues generated by the handling, storage, sale, preparation, cooking, and serving of foods, commonly called garbage. A subcategory of urban

or non-hazardous special waste. Food waste is classified as urban waste only if it is derived from housing units. Food waste from restaurants, military dining halls, Exchanges, or any other public activity is classified as special non-hazardous waste, unless Municipalities classify such special waste as urban waste (see Commercial Urban Waste).

C7.2.11. Hazardous Waste. Any waste identified as hazardous in the European List of Wastes (Addendum 2) or presenting 1 or more hazardous properties and containing constituents in concentrations at or above the thresholds listed in Appendix B.1. Refer to Chapter 6, “Hazardous Waste.”

C7.2.12. Hazardous Waste Generation. Any act or process that produces hazardous urban or special waste as defined in this document.

C7.2.13. Inert Waste. A sub-category of special or urban waste that does not undergo any significant physical, chemical or biological transformations. Inert waste will not dissolve, burn or otherwise physically or chemically react, biodegrade or adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm human health. The total leachability and pollutant content of the waste and the ecotoxicity of the leachate shall be insignificant, and in particular not endanger the quality of surface water and/or groundwater.

C7.2.14. Landfill. Disposal site for the deposit of the waste onto or into land (i.e., underground), including:

C7.2.14.1. Internal waste disposal sites (i.e., a landfill where a generator of waste is carrying out its own waste disposal at the place of production); and

C7.2.14.2. Permanent sites (i.e. operating longer than one year) which are not used for temporary storage of waste,

but excluding:

C7.2.14.3. Facilities where waste is unloaded in preparation for further transport for recovery, treatment or disposal elsewhere; and

C7.2.14.4. Storage of waste prior to recovery or treatment for a period < three years as a general rule; or

C7.2.14.5. Storage of waste prior to disposal for a period < one year.

C7.2.15. Landfill for Inert Waste. Landfill specifically designed to accept only inert waste.

C7.2.16. Landfill for Non-hazardous and Non-reactive Hazardous Waste. Landfill specifically designed to accept non-hazardous waste (including waste containing mineral fibers; waste containing gypsum; waste with a dry-substance content not lower than 25%; waste whose leachate meets established standards) and stable, non-reactive hazardous waste whose leachate meets established standards and whose Total Organic Compounds concentration is lower than 5%).

C7.2.17. Landfill for Hazardous Waste. Landfill specifically designed to accept only hazardous waste (including hazardous waste with a dry-substance content not lower than 25%, hazardous waste whose leachate meets established standards, waste containing or contaminated with PCB in concentration lower than 50 ppm, waste containing or contaminated with dioxins and/or furans in concentration lower than 10 ppb, waste whose Total Organic Compounds concentration for reactive substances is lower than 5%).

C7.2.18. Leachate. Any liquid percolating through the deposited waste and emitted from or contained within a landfill.

C7.2.19. Medical Waste. A sub-category of special waste. Medical waste is a waste generated by any health-related activity (including hospitals, dental clinics, and veterinary clinics). The medical waste definition includes both hazardous and non-hazardous medical waste and, among hazardous medical waste, it includes both infectious waste and non-infectious waste.

C7.2.20. Medical Waste Assimilated to Urban Waste. Medical waste declared by Municipal authorities to be urban waste.

C7.2.21. Medical Waste Comparable To Urban Waste. Non-hazardous waste listed below from medical facilities:

C7.2.21.1. Wastes produced from kitchens during the preparation of meals;

C7.2.21.2. Wastes from catering activities and food residues, excluding those from departments with infectious patients;

C7.2.21.3. Ordinary trash;

C7.2.21.4. Empty packaging;

C7.2.21.5. Garden waste; and

C7.2.21.6. Plasters, non-returnable sheets and clothes, medical towels, bandages and bags for urine (excluding material from infectious patients).

C7.2.21.7. Provided that sterilization treatment is performed and provided that the final disposal is performed in an incineration plant for urban waste (or, in case of non-availability of the incinerator, the Regional authority has issued the approval for disposal in landfill): wastes produced by public and private medical facilities, including wastes from catering activities and food residues from departments with infectious patients; wastes from medications; biological wastes and their containers; wastes from diagnostic, therapeutic, and research activities; and wastes from departments with infectious patients or from facilities dedicated to their care.

C7.2.22. Non-hazardous Waste. Any waste that is not identified as hazardous by the European List of Wastes (Addendum 2), or through analysis as per Appendix B.1. The re-classification of hazardous waste to non-hazardous waste cannot be obtained by dilution or mixing with substances resulting in a reduction of the initial concentration of hazardous substances.

C7.2.23. Open Burning. Burning of solid wastes in the open, such as in an open dump.

C7.2.24. Open Dump. A 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.

C7.2.25. Packaging. Materials of any nature to be used for the containment, protection, handling, delivery and presentation of goods, from raw materials to processed goods. Items are considered to be packaging even if they may have other functions unless the item is an integral part of the product. Packaging components and ancillary elements integrated into packaging shall be considered to be part of the packaging into which they are integrated; for example labels, staples, plastic sleeves.

C7.2.26. POL. Refined petroleum, oils and lubricants.

C7.2.27. Residential Urban Waste. Domestic urban waste (excluding bulky wastes) generated by the normal activities of households.

C7.2.28. Scrap Vehicle. A motor vehicle or its parts (including tires) that the owner intends to or is required to dispose of.

C7.2.29. Service Solid Waste Management Manual. Naval Facility Manual of Operation (NAVFAC MO) 213, Air Force Regulation (AFR) 91-8, Army TM 5-634 (Solid Waste Management), or their successor documents.

C7.2.30. Sludge. A special waste generated from drinking water or any other water treatment activities, from wastewater treatment activities, and from fumes abatement.

C7.2.31. Special Waste. Any non-urban waste generated by the following activities:

C7.2.31.1. Waste from agricultural and agricultural-industrial activities;

C7.2.31.2. Waste from demolition activities, construction, and excavation (see also Construction and Demolition Waste);

C7.2.31.3. Waste from industrial activities (e.g., paint booth processes);

C7.2.31.4. Waste from handicraft activities (e.g., MWR hobby shops, car body shops, or wood carpentry shops);

C7.2.31.5. Waste from commercial activities (e.g., commissaries, car repair shops, etc.);

C7.2.31.6. Waste from service activities (e.g., offices);

C7.2.31.7. Waste derived from waste recovery and/or disposal, sludge from wastewater treatment plants, and potable water treatment plants, and from smoke abatement systems;

C7.2.31.8. Medical waste (e.g., hospitals, veterinary clinics, dental facilities, flightline clinics);

C7.2.31.9. Tires; and

C7.2.31.10. Military waste:

C7.2.31.10.1. Special equipment;

C7.2.31.10.2. Arms and arms systems (e.g., Powders, explosives, and propellants; aircraft fuels specifically formulated for military use);

C7.2.31.10.3. Munitions;

C7.2.31.10.4. Military goods;

C7.2.31.10.5. Naval units (ships);

C7.2.31.10.6. Aircraft;

C7.2.31.10.7. Methods for weapons transport;

C7.2.31.10.8. Systems and electronic equipment;

C7.2.31.10.9. Electronics for the elaboration or transmission of classified information;

C7.2.31.10.10. Cryptographic devices;

C7.2.31.10.11. Electronic weapons;

C7.2.31.10.12. Radio apparatus;

C7.2.31.10.13. Radio links;

C7.2.31.10.14. Antennae;

C7.2.31.10.15. Centralized telephone and information systems;

C7.2.31.10.16. Information storage;

C7.2.31.10.17. Sensitive data transmission;

C7.2.31.10.18. Electronic warfare systems; and

C7.2.31.10.19. Infrastructures intended for the military defense and the national security.

C7.2.31.11. Special waste includes both non-hazardous and hazardous waste. Hazardous wastes are identified in the European List of Wastes (Addendum 2), or through analysis per Appendix B.1. The re-classification of hazardous waste to non-hazardous waste cannot be obtained by dilution or mixing with substances resulting in a reduction of the initial concentration of hazardous substances.

C7.2.32. Temporary Waste Storage Area (TWSA). A non-authorized area located within the installation fenceline where temporary waste accumulation and storage activities occur (to include hazardous and non-hazardous waste) before being transferred to a WSA site or picked-up for off-site shipment. Each TWSA must be designated as either volume limited or time limited, as described below.

C7.2.32.1. Volume Limited TWSA. Waste can be stored for up to 1 year if quantities $\leq 30 \text{ m}^3$ (1,059 ft^3), of which $\leq 10 \text{ m}^3$ (353.14 ft^3), shall be for hazardous waste; or

C7.2.32.2. Time Limited TWSA. Waste exceeding the volume specified in C7.2.32.1 may only be stored for a period of up to three months. The duration may be extended to one year if the deposit is located on a small island.

C7.2.32.3. The temporary deposit of waste shall ensure the segregation of waste types with respect to technical-military standards governing the management of the dangerous substances contained in the waste.

C7.2.32.4. Military waste is defined in the list above for Special Waste and waste originated from military vessels and installations supporting the military defense and national security cannot be held in a TWSA longer than 12 months, regardless of the quantity.

C7.2.33. Transporter. The authorized person, agent, or company who physically transports waste on public roads.

C7.2.34. Unique Generator Identification Number. The generator identification is accomplished using the Unique Identification Number assigned by the Italian authorities.

C7.2.35. Unique Identification Number. A unique number that the Italian authorities issue to any citizen, company, or public body (including foreign citizens residing in Italy) doing business or having related activities in Italy. The 16-digit number is required when filing numerous public and private documents.

C7.2.36. Unique Waste Identification Code. The six-digit Waste Code (CER) listed in the European List of Wastes (Addendum 2) that is provided for each waste. This number is used by installations to identify a known waste and to ease the waste management and record-keeping process.

C7.2.37. Urban Waste. Waste produced in urban (municipal) areas, including:

C7.2.37.1. Residential waste, including bulky waste from households or housing units;

C7.2.37.2. Non-hazardous waste that is not generated by households, but that can be considered as urban waste in terms of quality and quantity, according to the provisions listed in the waste management regulation issued by the local Municipality;

C7.2.37.3. Waste from street-cleaning activities;

C7.2.37.4. Any type of waste from any public area such as roads, parks, beaches, lake shores, river shores, or similar public areas;

C7.2.37.5. Yard waste from gardens, parks, and cemeteries, including trees, branches, and stumps; and

C7.2.37.6. Wastes from exhumation and any other waste from cemetery areas different from those in numbers C7.2.37.2, C7.2.37.3, and C7.2.37.4 above.

C7.2.37.7. Septic pump-out waste is excluded from the definition of urban waste.

C7.2.38. Urban Waste Storage Container. A receptacle used for the temporary storage of urban waste while awaiting collection.

C7.2.39. Vector. A carrier that is capable of transmitting a pathogen from one organism to another.

C7.2.40. Waste. Any substance, material, or object that the waste generator (producer) discards, intends to discard, or is required to discard, including material sent for recovery. Waste is classified according to its origin as either urban (municipal) waste or as special waste, and is further sub-classified as hazardous waste or as non-hazardous waste. A complete list of waste streams with the corresponding Waste Code is provided in the European List of Wastes (Addendum 2).

C7.2.41. Waste Generation. The act or process of producing waste.

C7.2.42. Waste Generator. A generator is considered to be the entity, whose processes or actions generate waste.

C7.2.43. Waste Loading and Unloading Register. A specific and dedicated log book, kept at the installation, used to record all waste transfers, which includes all onsite “loading” operations (i.e., data on waste temporarily stored at the site including waste code, amount and date of storage) and all “unloading” operations undertaken at the site (i.e., data on waste shipped off-site for disposal/recovery/recycling, including waste code, amount shipped, date of transport, and name of waste carrier). Waste collected by the municipality is not required to be recorded on this waste register.

C7.2.44. Waste Manifest. A specific form used to track the shipment of special waste from its point of origin to its point of disposal.

C7.2.45. Waste Storage Area (WSA). An authorized area (different than a TWSA) where the storage of waste (both hazardous and/or non hazardous) occurs prior to disposal through any activity listed in Appendix B.2 or recovery activity listed in Appendix B.3. Special waste may be stored no longer than one year at a WSA unless otherwise specified in the authorization. A WSA site shall be authorized via the Italian Base Commander, in accordance with the procedures established in Chapter 1 (see C7.3.6.4).

C7.2.46. Waste Treatment. Any method, technique, or process, designed to change the physical, chemical, or biological characteristics or composition of any waste so as to render such waste non-hazardous, or less dangerous to the persons exposed or to the environment; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in

volume. (Note: Sterilization of medical waste at the waste-generating medical facility is not classified as treatment.

C7.2.47. WSA Manager. A person on the installation with the operational responsibility for receiving, storing, inspecting, and generally managing the installation's WSA.

C7.3. CRITERIA

C7.3.1. Waste Classification. Waste generating activities will classify their waste streams using the European List of Wastes (Addendum 2). Laboratory analysis shall be used to identify the chemical constituents of unknown wastes.

C7.3.1.1. Waste Analysis Plan. The TWSA/WSA 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 also include procedures for characterization and verification testing of unknown wastes. The plan should include: parameters for testing and rationale for choosing them, frequency of analysis, test methods, and sampling methods. In addition, waste analyses shall be performed prior to transferring waste to recycling/disposal facilities (at the first shipment and then at least annually and when the waste generating process changes significantly).

C7.3.1.2. Waste generators shall keep a Waste Loading and Unloading Register which each waste loading and unloading operation shall be registered with the proper unique waste identification codes from the European List of Wastes (Addendum 2). In addition the waste generator shall complete the annual waste report (MUD); see C7.3.4.3.

C7.3.2. Transportation Criteria

C7.3.2.1. Waste transporters shall be registered in Italy and vehicles shall be appropriately licensed.

C7.3.3. Manifesting Criteria. All waste (urban and special waste, whether hazardous or non-hazardous) leaving the installation will be accompanied by the waste manifest to ensure a complete audit trail from point of origin to ultimate disposal. (Note: urban waste removed by the Municipal authority with its own vehicles does not have to be manifested.)

C7.3.3.1. The manifest shall include the following information:

C7.3.3.1.1. Name, address, and Unique Identification Number of the generator of the waste;

C7.3.3.1.2. Name, address, and financial code of the waste transporter;

C7.3.3.1.3. Origin, waste code, and quantity of waste;

C7.3.3.1.4. Disposal or recovery code to be used (see Appendices B.2 and B.3);

C7.3.3.1.5. Name of disposal facility;

- C7.3.3.1.6. Date and route to the disposal and/or treatment facility;
- C7.3.3.1.7. Transport vehicle license plate number and driver's name; and
- C7.3.3.1.8. Name and address of the receiver.

C7.3.3.2. The waste manifest shall be completed in quadruplet, all dated and signed by the waste generator and countersigned by the transporter. The waste generator shall retain one copy, and another copy must be returned by the transporter to the waste generator within three months of delivery of the waste to the disposal/treatment facility (or six months for out-of-country disposal). Installations shall notify the Italian Base Commander if the installation does not receive a copy of the manifest from the transporter within three months of the delivery of the waste for in-country disposal (or six months for out-of-country disposal).

C7.3.3.3. Both copies of the waste manifest shall be kept on file for at least five years from the date of shipment. These copies shall be kept physically together with the waste loading and unloading register.

C7.3.4. Record-Keeping Criteria

C7.3.4.1. ID Number. Each generator will use the installation's Unique Identification Number for all record-keeping, reports, and manifests for waste. For DoD internal tracking purposes, a separate unique identification number may also be used.

C7.3.4.2. Each generator will use the European List of Wastes (Addendum 2) to assign each waste a unique waste identification code. This unique waste identification code shall be used in all reporting, manifesting, and record-keeping.

C7.3.4.3. MUD Report (Annual Waste Report). An annual declaration of the waste generated during the previous year shall be submitted to the Italian Base Commander (see Chapter 1 for the process).

C7.3.4.4. Turn-In Documents. Turn-in documents [(e.g., waste manifests) and DD Form 1348-1A] must be maintained for five years.

C7.3.4.5. Waste Loading and Unloading Register. Solid waste collected by the municipality is not required to be recorded on this waste register. In addition to the various waste logs to be maintained for each TWSA and/or WSA, a Waste Loading and Unloading Register shall be maintained at each installation, for both hazardous and non-hazardous waste. The waste register will be used to record all manifested waste generated and shipped off base; entries shall be made within 10 business days from the generation/shipment operation. The waste loading and unloading register will be retained for five years after the date of its last entry, and will have the two signed copies of the waste manifest attached. More than one register can be present at each installation, as long as there are no duplicate entries.

C7.3.4.6. Inspection Logs. Records of inspection logs shall be maintained for a period of five years.

C7.3.4.7. Manifests. Manifests of incoming and outgoing special wastes, including medical waste, will be retained for a period of five years. Two signed copies of the waste manifest shall be retained together with the Loading and Unloading Register (see C7.3.4.5).

C7.3.4.8. Waste Analysis/Characterization Records. Records of waste analysis/characterization shall be maintained for a period of five years.

C7.3.4.9. Waste Records. Installation will maintain records, identified in C7.3.4. for all waste streams generated on the installation.

C7.3.5. General Criteria for Special Waste

C7.3.5.1. Segregation of Waste. Waste will be segregated by waste stream at its point of origin and while in storage (either at the HWAP, TWSA, or WSA). Hazardous waste will also be segregated from non-hazardous waste.

C7.3.5.2. Landfill Requirements

C7.3.5.2.1. Wastes, including special waste, shall be treated prior to disposal in landfills except for:

C7.3.5.2.1.1. Inert special waste whose treatment is not technically feasible;

C7.3.5.2.1.2. Special waste for which treatment will not reduce its negative effect on environment or risk to human health.

C7.3.5.2.2. Special waste shall meet the criteria of the landfill in which it is disposed.

C7.3.5.2.3. Any special waste stream directly disposed of in a landfill shall be analyzed at least annually, and its chemical characteristics reported to the landfill operator. Waste shall meet the acceptance criteria of the landfill in which it is disposed. The waste characterization shall include the results of the leaching test.

C7.3.5.3. Construction & Demolition Waste. Construction and demolition waste is a special waste classified as non-hazardous or hazardous (refer to the European List of Wastes, waste series 17). Waste which is classified, for the purpose of its disposal into landfill as an inert waste, shall be disposed of in authorized landfills for inert waste. Hazardous construction/demolition waste shall be disposed of in authorized landfills for hazardous waste.

C7.3.6. Criteria for Non-Hazardous Special Waste

C7.3.6.1. Waste Storage Containers. Storage containers should be leak-proof, 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.

C7.3.6.2. Waste Container Storage Sites. Containers should be stored on a firm, level, well-drained surface which is large enough to accommodate all of the containers and which is maintained in a clean, spillage-free condition.

C7.3.6.3. Temporary Waste Storage Area (TWSA)

C7.3.6.3.1. DoD installations shall select one of the following two methods for managing non-hazardous special waste temporarily stored at TWSAs within its physical boundaries:

C7.3.6.3.1.1. Volume Limited TWSA. Waste can be stored for up to 1 year if quantities $\leq 30 \text{ m}^3$ (1,059 ft^3), of which $\leq 10 \text{ m}^3$ (353.14 ft^3), shall be for hazardous waste ; or

C7.3.6.3.1.2. Time Limited TWSA. Waste exceeding the quantities specified in C7.3.6.3.1.1 may only be stored for a period of up to three months. The duration may be extended to one year if the temporary deposit is located on a small island.

C7.3.6.3.2. Installations shall indicate in their waste management plan which of the two methods is being used for each TWSA.

C7.3.6.3.3. TWSAs will comply with the storage limits in C7.3.6.3.1. When these limits have been reached, the generator must have the non-hazardous special waste removed for disposal or have it moved to a WSA. Arrangements must include submission of all appropriate turn-in documents to initiate the removal (e.g., DD Form 1348-1A) to appropriate DoD authorities responsible for removing the special waste (e.g., DLA Disposition Services) or preparation of the waste manifest when using an Italian-permitted company.

C7.3.6.4. Waste Storage Area (WSA)

C7.3.6.4.1. The operation of WSAs shall be authorized. Installations that intend to operate a WSA shall provide the Italian Base Commander with sufficient information to seek an authorization (see Chapter 1 for the process). The basic information to be provided to the Italian Base Commander shall include:

C7.3.6.4.1.1. Name and address of generator/generating activity(ies);

C7.3.6.4.1.2. Type and quantity of waste forecasted;

C7.3.6.4.1.3. Technical specifications of the area (e.g., safety devices, structures, etc.); and

C7.3.6.4.1.4. Other documents if requested by the Italian Base Commander.

C7.3.6.4.2. Non-hazardous special waste may be stored up to one year in a WSA, unless otherwise prescribed in the authorization. When these limits have been reached, the generator shall have the special waste removed. Arrangements must include submission of all appropriate turn-in documents to initiate the removal (e.g., DD Form 1348-1A) to appropriate DoD authorities responsible for removing the waste (e.g., DLA Disposition Services) or preparation of the waste manifest when using an Italian-permitted company.

C7.3.6.5. Non-Hazardous Special Waste Disposal

C7.3.6.5.1. Special Waste Treatment. All special waste treatment (recycling, recovery, etc.) shall be authorized. Authorizations are granted for specific types of wastes and treatments and last five years. A simplified authorization can be obtained for the waste recovery activities listed in Appendix B.4. DoD generators who intend to operate a special waste treatment plant on their installation shall obtain the approval of the DoD LEC (via the Component chain of command) and shall provide the Italian Base Commander with sufficient information to seek an authorization for the treatment activity.

C7.3.6.6. Composting Facilities (exclusive of green mulch composting). Composting facilities shall be authorized with the exclusion of green mulch composting. DoD installations that intend to operate composting facilities to process sludge from their domestic wastewater treatment plant (See Chapter 4, "Wastewater") shall provide the Italian Base Commander with sufficient information to seek an authorization for their composting facility (see Chapter 1 for the process). The facility will comply with the following criteria unless more protective criteria are established in their authorization:

C7.3.6.6.1. 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.

C7.3.6.6.2. Access to the facility must be controlled. All access points must be secured when the facility is not in operation.

C7.3.6.6.3. 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.

C7.3.6.6.4. 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.

C7.3.6.6.5. The temperature and retention time for the material being composted must be monitored and recorded.

C7.3.6.6.6. Periodic analysis, including analysis conducted at the end of the production process 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, polychlorinated biphenyls, glass (particles), plastic, iron, humidity, organic matter, humic matter, carbon/nitrogen (C/N) ratio, and potassium oxide (K₂O).

C7.3.6.6.7. Compost must be produced by a process to further reduce pathogens. Two such acceptable methods are:

C7.3.6.6.7.1. Windrowing, which consists of an unconfined composting process involving periodic aeration and mixing to maintain aerobic conditions during the composting process.

C7.3.6.6.7.2. 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°C (131°F). A stabilization period of at least 7 days must follow the decomposition period.

C7.3.6.6.8. The transportation of sludge shall be conducted with appropriate, dedicated vehicles and shall follow procedures to prevent risk to human health and the environment.

C7.3.6.6.9. Classification & Use of Compost. Compost produced at a composting facility that is located on a DoD installation, and that processes sludge from a domestic wastewater treatment plant (see Chapter 4, “Wastewater”) must meet the parameter limits in Table 7.1 at the end of the composting process. The distribution and application of the compost should be based on the agronomic characteristics and the composition of the soil at the point of end use as indicated in Tables 7.1 and 7.2.

C7.3.6.6.9.1. To be distributed for agricultural applications at the end of the composting process, the compost should have the characteristics listed in Table 7.3.

C7.3.6.6.9.2. Compost which fails to meet the standards in Tables 7.1, 7.2, or 7.3 shall be disposed of either by landfilling or incineration.

C7.3.6.7. Cooking Oils & Grease Waste. Cooking oils and grease waste generated by activities like installation exchanges, dining facilities, schools, hospitals, restaurants, and similar public services, shall be separated at the point of generation, placed in dedicated containers, and turned over to an Italian-permitted transporter for disposal. (Note: This criterion is not applicable to cooking oils and grease waste generated in households unless they are collected by the municipal service.)

C7.3.7. General Criteria for Urban Waste

C7.3.7.1. Installations shall consult with the Italian Base Commander on issues pertaining to the management of urban waste.

C7.3.7.2. Installations will develop and implement a strategy to reduce urban waste disposal. This strategy shall include recycling, composting, or waste minimization efforts. The strategy shall also include the means for separate collection of packaging waste and its recovery/recycling through coordination with the appropriate Italian consortium.

C7.3.7.3. Recycling programs will be instituted on DoD installations in accordance with the policies in DoDI 4715.4 (Pollution Prevention). These programs shall provide for separate collection and recycling/recovery of primary and secondary packaging wastes, appliances, and large auto parts. Landfilling of such recovered wastes is prohibited. Disposal of

recycled/recovered material shall be coordinated with the Italian Base Commander and with the appropriate Italian consortium.

C7.3.7.3.1. Before arranging for the re-use, recycling, or disposal of electronic equipment and electronics, including CDs and DVDs, DoD should take all measures and utilize qualified technical procedures to prevent unauthorized access to personal data, as well as classified data that is saved in electronics and electrical equipment.

C7.3.7.3.2. DoD installations shall ensure the proper packaging of toner cartridges for laser printers and inkjets, as well as ribbon cartridges destined for recycling and/or recovery.

C7.3.7.4. Urban waste collection and transport for disposal purposes shall be conducted directly by the local Municipality or by an entity that is authorized by the Municipality. DoD installations that intend to conduct urban waste transportation for disposal purposes shall provide the Italian Base Commander with sufficient information to seek an authorization (see Chapter 1 for the process).

C7.3.7.4.1. DoD urban solid wastes will be treated, stored, and disposed of in authorized facilities.

C7.3.8. Criteria for Non-Hazardous Urban Waste

C7.3.8.1. Urban Waste Storage Containers

C7.3.8.1.1. Storage containers should be leak-proof, 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.

C7.3.8.2. Urban Waste Container Storage Sites

C7.3.8.2.1. Containers should be stored on a firm, level, well-drained surface which is large enough to accommodate all of the containers and which is maintained in a clean, spillage-free condition.

C7.3.8.2.1.1. All urban wastes or materials, including those which 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 to avoid spillage.

C7.3.8.3. Bulky Wastes

C7.3.8.3.1. DoD units collecting bulky waste (e.g., refrigerators, freezers, televisions, washing machines, air conditioners, computers, etc.) shall return the waste appliances to their point of purchase if feasible. If not feasible, they shall be turned over to authorized collection points (via DLA Disposition Services). Scrap vehicles/trailers and large vehicle parts will be handled in accordance with C6.3.9.11. (Chapter 6, "Hazardous Waste"). Some bulky wastes contain hazardous wastes and are subject to the same requirements as

hazardous waste (e.g., storage, manifesting, disposal requirements, etc.). Also see C7.3.9. (Criteria for Hazardous Urban Waste).

C7.3.8.3.2. 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, “Air Emissions,” or hazardous constituents as defined in Chapter 6, “Hazardous Waste.” Readily detachable or removable hazardous special waste will be segregated and disposed of in accordance with Chapters 6, 14 and 15.

C7.3.8.4. Design of Urban Waste Storage Areas

C7.3.8.4.1. In the design of all buildings or other facilities that are constructed, modified, or leased after the effective date of this document, there will be provisions for storage in accordance with these guidelines that will accommodate the volume of urban waste anticipated. Storage areas will be easily cleaned and maintained, and will allow for safe, efficient collection.

C7.3.8.5. Approval for New/Expanded Landfills

C7.3.8.5.1. Installations will not initiate new or expand existing landfill units without approval of the Unified Combatant Commander with responsibility for the area where the landfill would be located and only after justification that unique circumstances mandate a new unit.

C7.3.8.5.2. New landfills and existing landfills still in operation after 16 July 2005 shall be designed and operated to meet the requirements for inert waste, non-hazardous waste or hazardous waste landfill, whichever is appropriate, and shall be authorized. Installations that intend to construct or operate a landfill shall provide the Italian Base Commander with sufficient information to seek an authorization (see Chapter 1 for the process).

C7.3.8.6. Burning

C7.3.8.6.1. Open burning shall not be used for the disposal of urban waste. Burning shall be conducted using Italian-permitted incinerators that meet the air quality requirements in Chapter 2, “Air Emissions.”

C7.3.8.6.2. New incinerators shall conduct the combustion process together with energy recovery. Urban waste incinerators shall not have a capacity of < 100 tonnes/day (110.23 tons/day) of waste.

C7.3.9. Criteria for Hazardous Urban Waste. Hazardous urban wastes shall be managed according to the following criteria:

C7.3.9.1. Collected separately from any other urban waste and disposed of by the local Municipality if operating such service

C7.3.9.2. If collection and disposal service for hazardous urban waste is not provided by the Municipality, the installation shall manage and dispose of this waste as special hazardous waste. In that case, mercury, nickel-cadmium, and lithium batteries from household appliances shall be managed in accordance with C6.3.9.12. (Chapter 6, “Hazardous Waste,” Criteria for Batteries). Also refer to C7.3.8.3. (Bulky Wastes).

Table 7.1. Parameter Limits for Sludge, after Composting

Parameter	Unit of Measure	Limit of Acceptability
C/N Ratio	--	< 30
Cadmium	mg/kg on a dry weight basis	10
Chromium	mg/kg on a dry weight basis	1,000
Copper	mg/kg on a dry weight basis	500
Glass (particle)	mm	≤ 3
Glass (total)	% on a dry weight basis	≤ 3
Inert materials	% on a dry weight basis	≤ 3
Iron	% on a dry weight basis	≤ 0.5
Humic Matter	% on a dry weight basis	< 20
Humidity	% on a dry weight basis	< 45
K ₂ O	% on a dry weight basis	> 0.4
Lead	mg/kg on a dry weight basis	500
Organic Matter	% on a dry weight basis	< 40
Mercury	mg/kg on a dry weight basis	5
Nickel	mg/kg on a dry weight basis	100
P ₂ O ₅	% on a dry weight basis	> 0.5
Particle Size	mm	0.5 – 25
PCB	mg/kg on a dry weight basis	1
Plastics	% on a dry weight basis	≤ 1
Total Nitrogen	% on a dry weight basis	> 1
Zinc	mg/kg on a dry weight basis	1,000

Table 7.2. Maximum Concentrations for Parameters in Soil, if Sludge is Applied for Agriculture

Parameter	Maximum Concentration in Soil (mg/kg of dry soil)	Maximum Amount That Can Be Applied (g/ha/yr)
Arsenic	10	100
Cadmium	3	15
Chromium VI	3	15
Chromium III	50	2,000
Copper	100	3,000
Lead	100	500
Mercury	2	15
Nickel	50	1,000
Zinc	300	10,000

Table 7.3. Maximum Parameter Concentrations for Sludge Applied for Agriculture

Parameter	Unit of Measure	Limit
Arsenic	mg/kg on a dry weight basis	10
Cadmium	mg/kg on a dry weight basis	10
Chromium VI	mg/kg on a dry weight basis	500
Chromium III	mg/kg on a dry weight basis	10
Copper	mg/kg on a dry weight basis	600
Lead	mg/kg on a dry weight basis	500
Mercury	mg/kg on a dry weight basis	10
Nickel	mg/kg on a dry weight basis	200
pH	pH unit	6 - 8.5
Salmonella	# /50 g	Absent
Weed seeds	# /50 g	Absent
Zinc	mg/kg on a dry weight basis	2,500

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C8. CHAPTER 8MEDICAL WASTEC8.1. 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 waste also includes mixtures of medical waste and hazardous waste. It does not apply to what otherwise would be household waste.

C8.2. DEFINITIONS

C8.2.1. Anatomical Pathology Waste. A subcategory of infectious medical waste that includes: human tissues and organs, amputated limbs or other body parts, fetuses, placentas, and similar tissues from surgery, delivery, or autopsy procedures; animal carcasses; and body parts. The term does not include teeth or unidentifiable body parts.

C8.2.2. Annual Waste Report. (Modello Unico di Dichiarazione Ambientale—MUD). An official statement listing quantity and type of waste generated and disposed of in the previous calendar year.

C8.2.3. Cremation. Burning of human or animal dead bodies at high temperatures in order to transform them into ashes.

C8.2.4. DLA. Defense Logistics Agency.

C8.2.5. Hazardous Waste. Any waste identified as hazardous in the European List of Wastes (Addendum 2) or presenting 1 or more hazardous properties and containing constituents in concentrations at or above the thresholds listed in Appendix B.1. Refer to Chapter 6, “Hazardous Waste.”

C8.2.6. Hazardous Waste Accumulation Point (HWAP). A shop, site, or other work center where hazardous wastes are accumulated until removed to a Temporary Waste Storage Area (TWSA) or Waste Storage Area (WSA), or shipped for treatment or disposal. An HWAP may be used to accumulate no more than 208 liters (55 gallons) of hazardous waste or 1 liter (1 quart) of acute hazardous waste, from each waste stream. The HWAP must be at or near the point of waste generation and under the control of the operator.

C8.2.7. Hazardous Waste Log. A listing of hazardous waste deposited and removed from a TWSA or WSA. Information such as the waste type, volume, location, and storage removal dates should be recorded. (Note: This is distinct from the Waste Loading and Unloading Register).

C8.2.8. 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.

C8.2.9. Infectious Medical Waste. A sub-category of special waste that is specially managed because it has the potential for causing disease in humans and may pose a risk to both individuals or community health if not managed properly, and that includes the following classes:

C8.2.9.1. 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.

C8.2.9.2. 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 from contaminated animals are also included.

C8.2.9.3. 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.

C8.2.9.4. 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.

C8.2.9.5. 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.

C8.2.9.6. Infectious waste from isolation rooms, but only including those items that were contaminated or likely to have been contaminated with infectious agents or pathogens, including excretion exudates and discarded materials contaminated with blood.

C8.2.9.7. Waste generated from non-medical locations, which present analogous infection risk.

C8.2.10. Medical Director. The manager in charge of operations at a medical or health-related facility.

C8.2.11. Non-infectious Medical Waste. A sub-category of medical waste that includes expired or discarded chemicals containing hazardous substances from care, diagnosis, treatment or prevention of diseases in humans or in animals, and amalgam waste from dental care, and cytotoxic and cytostatic medicines.

C8.2.12. Medical Waste. A sub-category of special waste. Medical waste is a waste generated by any health-related activity (including hospitals, dental clinics, and veterinary clinics). The medical waste definition includes both infectious and non-infectious waste and excludes the following:

C8.2.12.1. Wastes produced from kitchens during the preparation of meals;

C8.2.12.2. Wastes from catering activities and food residues, excluding those from departments with infectious patients;

C8.2.12.3. Ordinary trash;

C8.2.12.4. Empty packaging;

C8.2.12.5. Garden waste; and

C8.2.12.6. Plasters, non-returnable sheets and clothes, medical towels, bandages and bags for urine (excluding material from infectious patients).

C8.2.13. Medical Waste Requiring Particular Disposal Procedure. Expired or non-used pharmaceuticals, drugs and other psychotropic medicines; non-identifiable body-parts; and animals waste from laboratory tests.

C8.2.14. Radioactive Medical Waste. Any waste originated from a medical or health related facility contaminated with radioactive material (i.e., from radiology or nuclear medicine wards).

C8.2.15. Sterility Assurance Level (SAL). The probability that the waste is not sterilized after the treatment. For the purposes of this Chapter, the acceptable SAL value is 10^{-6} .

C8.2.16. Sterilization. Reduction of the microbial contamination, to guarantee an SAL value of 10^{-6} . Process includes grinding, drying and volume reduction of waste.

C8.2.17. Transporter. The authorized person, agent, or company who physically transports waste on public roads.

C8.2.18. Unique Generator Identification Number. The generator identification is accomplished using the Unique Identification Number assigned by the Italian authorities.

C8.2.19. Unique Identification Number. A unique number that the Italian authorities issue to any citizen, company, or public body (including foreign citizens residing in Italy) doing business or having related activities in Italy. The 16-digit number is required when filing numerous public and private documents.

C8.2.20. Unique Waste Identification Code. The six-digit Waste Code (CER) listed in the European List of Wastes (Addendum 2) that is provided for each waste. This number is used by installations to identify a known waste and to ease the waste management and record-keeping process.

C8.2.21. Urban Waste. Waste produced in urban (municipal) areas, including:

C8.2.21.1. Residential waste, including bulky waste from households or housing units;

C8.2.21.2. Non-hazardous waste that is not generated by households, but that can be considered as urban waste in terms of quality and quantity, according to the provisions listed in the waste management regulation issued by the local Municipality;

C8.2.21.3. Waste from street-cleaning activities;

C8.2.21.4. Any type of waste from any public area such as roads, parks, beaches, lake shores, river shores, or similar public areas;

C8.2.21.5. Yard waste from gardens, parks, and cemeteries, including trees, branches, and stumps; and

C8.2.21.6. Wastes from exhumation and any other waste from cemetery areas different from those in numbers C8.2.21.2, C8.2.21.3, and C8.2.21.4 above.

C8.2.21.7. Septic pump-out waste is excluded from the definition of urban waste.

C8.2.22. Waste Generator. A generator is considered to be the entity whose processes or actions generate waste.

C8.2.23. Waste Loading and Unloading Register. A specific and dedicated log book, kept at the installation, used to record all waste transfers, which includes all onsite “loading” operations (i.e., data on waste temporarily stored at the site including waste code, amount and date of storage) and all “unloading” operations undertaken at the site (i.e. data on waste shipped off-site for disposal/recovery/recycling, including waste code, amount shipped, date of transport, and name of waste carrier). Waste collected by the municipality is not required to be recorded on this waste register.

C8.2.24. Waste Manifest. A specific form used to track the shipment of special waste from its point of origin to its point of disposal.

C8.2.25. WSA Manager. A person on the installation with the operational responsibility for receiving, storing, inspecting, and generally managing the installation's WSA.

C8.3. CRITERIA

C8.3.1. Waste Classification. Waste generating activities will classify their waste streams using the European List of Wastes (Addendum 2). Laboratory analysis shall be used to identify the chemical constituents of unknown wastes.

C8.3.2. Waste Analysis Plan. The TWSA/WSA 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 also include procedures for characterization and verification testing

of unknown wastes. The plan should include: parameters for testing and rationale for choosing them, frequency of analysis, test methods, and sampling methods. In addition, waste analyses shall be performed prior to transferring waste to recycling/disposal facilities (at the first shipment and then at least annually and when the waste generating process changes significantly).

C8.3.2.1. Waste generators shall keep a Waste Loading and Unloading Register which each waste loading and unloading operation shall be registered with the proper unique waste identification codes from the European List of Wastes (Addendum 2). In addition the waste generator shall complete the annual waste report (MUD).

C8.3.3. Transportation Criteria

C8.3.3.1. When transporting hazardous waste via commercial transportation on Italian public roads and highways, HW generators will prepare off-installation HW shipments in compliance with the packaging and labeling requirements of Chapter 5, "Hazardous Material."

C8.3.3.2. Waste transporters shall be registered in Italy and vehicles shall be appropriately licensed.

C8.3.3.3. The transportation of hazardous waste on public roads and highways shall be conducted by Italian-permitted companies. Installations that intend to transport hazardous waste via military vehicles on Italian public roads and highways must provide the Italian Base Commander with sufficient information to seek an authorization for their transport. As an alternative, Italian-permitted waste transport companies may be used for off-base transport of waste.

C8.3.4. Manifesting Criteria. All waste (urban and special waste, whether hazardous or non-hazardous) leaving the installation will be accompanied by the waste manifest to ensure a complete audit trail from point of origin to ultimate disposal. (Note: urban waste removed by the Municipal authority with its own vehicles does not have to be manifested.)

C8.3.4.1. The manifest shall include the following information:

C8.3.4.1.1. Name, address, and Unique Identification Number of the generator of the waste;

C8.3.4.1.2. Name, address, and financial code of the waste transporter;

C8.3.4.1.3. Origin, waste code, and quantity of waste;

C8.3.4.1.4. Disposal or recovery code to be used (see Appendices B.2 and B.3);

C8.3.4.1.5. Name of disposal facility;

C8.3.4.1.6. Date and route to the disposal and/or treatment facility;

C8.3.4.1.7. Transport vehicle license plate number and driver's name; and

C8.3.4.1.8. Name and address of the receiver.

C8.3.4.2. The waste manifest shall be completed in quadruplet, all dated and signed by the waste generator and countersigned by the transporter. The waste generator shall retain one copy, and another copy must be returned by the transporter to the waste generator within three months of delivery of the waste to the disposal/treatment facility (or six months for out-of-country disposal). Installations shall notify the Italian Base Commander if the installation does not receive a copy of the manifest from the transporter within three months of the delivery of the waste for in-country disposal (or six months for out-of-country disposal).

C8.3.4.3. Both copies of the waste manifest shall be kept on file for at least five years from the date of shipment. These copies shall be kept physically together with the waste loading and unloading register.

C8.3.5. Record-Keeping Criteria

C8.3.5.1. ID Number. Each generator will use the installation's Unique Identification Number for all record-keeping, reports, and manifests for waste. For DoD internal tracking purposes, a separate unique identification number may also be used.

C8.3.5.1.1. Each generator will use the European List of Wastes (Addendum 2) to assign each waste a unique waste identification code. This unique waste identification code shall be used in all reporting, manifesting, and record-keeping.

C8.3.5.2. MUD Report (Annual Waste Report). An annual declaration of the waste generated during the previous year shall be submitted to the Italian Base Commander (see Chapter 1 for the process).

C8.3.5.3. Turn-In Documents. Turn-in documents [(e.g., waste manifests) and DD Form 1348-1A] must be maintained for five years.

C8.3.5.4. Inspection Logs. Records of inspection logs shall be maintained for a period of five years.

C8.3.5.5. Manifests. Manifests of incoming and outgoing special wastes, including medical waste, will be retained for a period of five years. Two signed copies of the waste manifest shall be retained together with the Loading and Unloading Register.

C8.3.5.6. Waste Analysis/Characterization Records. Records of waste analysis/characterization shall be maintained for a period of five years.

C8.3.5.7. Medical Waste Treatment Records. Installations shall maintain records (for at least five years after the date of disposal) of medical waste sterilization treatment, if any, including date of treatment and records of the sequential identification numbers of sterilized containers and of sterilization efficiency monitoring.

C8.3.6. Criteria for Medical Waste

C8.3.6.1. Infectious Medical Waste

C8.3.6.1.1. Medical Waste Storage & Transportation Containers

C8.3.6.1.1.1. 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.

C8.3.6.1.1.2. Sharps will only be discarded into rigid receptacles. Bags or receptacles (including rigid sharps containers) shall be placed inside a rigid puncture-resistant secondary container and hermetically sealed before being transported off site. The secondary container shall be cleaned and disinfected prior to any reuse.

C8.3.6.1.1.3. Sterilized medical waste shall be segregated separately from urban waste, via proper non-returnable packaging of a distinctive color to distinguish it from other waste-containing packaging.

C8.3.6.1.1.4. Infectious medical wastes classified under the European List of Wastes (Addendum 2) with unique waste identification codes 18.01.03 and 18.02.02, shall be collected separately at the point of their generation. (See Table 8.1).

C8.3.6.1.2. Marking of Storage Bags for Medical Waste

C8.3.6.1.2.1. All bags or receptacles used to segregate, transport, or store infectious medical waste will be clearly marked with the universal biohazard and the word “BIOHAZARD/RISCHIO BIOLOGICO” and “INFECTIOUS MEDICAL WASTE/RIFIUTI SANITARI PERICOLOSI A RISCHIO INFETTIVO.”

C8.3.6.1.2.2. Sharps containers shall be labeled with the words “SHARP AND PUNCTURING INFECTIOUS MEDICAL WASTE/RIFIUTI SANITARI PERICOLOSI A RISCHIO INFETTIVO TAGLIENTI E PUNGENTI.”

C8.3.6.1.2.3. The bags or receptacles shall be shock-resistant, report the name of the medical facility of origin, the date of generation and be of a proper color in order to be distinguished from other wastes.

C8.3.6.1.2.4. Containers of sterilized medical waste shall be labeled with the words “Rifiuti Sanitari Sterilizzati - Sterilized Medical Waste.” Containers of sterilized wastes shall also indicate the sterilization date. Containers shall be easily distinguishable from containers used for other types of waste by color.

C8.3.6.1.3. Storage. Infectious medical waste (other than medical waste comparable to urban waste) will not be placed in chutes or dumbwaiters, and will be transported and stored to minimize human exposure, according to the following requirements:

C8.3.6.1.3.1. Temporary deposit of infectious medical waste at the point of origin shall not exceed five days prior to being treated on site, transported to a WSA, or disposed off-site.

C8.3.6.1.3.2. If the stored quantity of infectious medical waste is ≤ 200 liters (52.83 gallons), the temporary deposit time at the point of origin can be extended to thirty days.

C8.3.6.1.3.3. Infectious medical waste shipped off base shall be recorded in the Waste Loading and Unloading Register within five days of its initial accumulation.

C8.3.6.1.3.4. Temporary storage and transport of sterilized medical waste shall be carried out separately from urban waste.

C8.3.6.1.3.5. Infectious medical waste will be maintained in a non-putrescent state, using refrigeration as necessary.

C8.3.6.1.3.6. Medical waste with multiple hazards (e.g., infectious medical waste or radioactive medical waste) will be segregated from the general hazardous medical waste stream when additional or alternative treatment is required. Different types of hazardous medical waste (i.e., infectious or non-infectious) shall not be commingled.

C8.3.6.1.3.7. Temporary deposit of medical waste at the point of origin shall be conducted in a manner that does not pose a risk to human health. The medical director of the facility producing the waste is responsible for the surveillance and fulfillment of these requirements.

C8.3.6.1.4. Storage sites of infectious medical waste must be:

C8.3.6.1.4.1. Specifically designated;

C8.3.6.1.4.2. Constructed to prevent entry of insects, rodents, and other pests;

C8.3.6.1.4.3. Prevent access by unauthorized personnel; and

C8.3.6.1.4.4. Marked on the outside with the universal biohazard symbol and the word "BIOHAZARD" in both English and Italian (RISCHIO BIOLOGICO), and properly labeled, indicating the type and nature of the stored waste and its hazards.

C8.3.6.1.5. Protective Apparel. 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. Such protective apparel:

C8.3.6.1.5.1. Shall be adequate to prevent the expected risks and shall not cause a higher risk ;

C8.3.6.1.5.2. Shall be adequate to the existing working conditions;

C8.3.6.1.5.3. Shall take into account the ergonomic or health needs of the workers; and

C8.3.6.1.5.4. Can be adapted to the users, according to their needs.

C8.3.6.1.6. Anatomical Pathology Waste

C8.3.6.1.6.1. All anatomical pathology waste must be collected and sealed in reinforced plastic bags at the place of origin; the bags shall comply with C8.3.6.1.1.1. The sealed bags must be kept in a controlled environment and transported with caution, and may only be disposed of by incineration or cremation followed by burial.

C8.3.6.1.7. Blood & Liquid Infectious Waste

C8.3.6.1.7.1. Blood, blood products, and other liquid infectious wastes shall be handled as follows:

C8.3.6.1.7.2. Samples of blood, urine, or feces may be decanted into clinical sinks if non-infectious.

C8.3.6.1.7.3. Disposal options for suction canister waste from operating rooms, bulk blood, blood products, and other liquid infectious medical waste are the following:

C8.3.6.1.7.3.1 Sealed in leak-proof containers and incinerated;

C8.3.6.1.7.3.2 Sterilized and incinerated;

C8.3.6.1.7.3.3 Sterilized and landfilled. Landfilling of sterilized infectious medical waste is authorized only in the absence of an incinerator in the Region where the waste is generated and it requires the prior approval of the President of the Region.

C8.3.6.1.7.4. Disposal of blood or liquid infectious medical waste through clinical sinks is not allowed (other than samples of blood, urine, and feces, if non-infectious).

C8.3.6.1.7.5. Disposal of liquid waste generated by non-medical facilities but presenting analogous infection risk (e.g., wastes from microbiological laboratories), through sinks is not allowed. Such waste shall be sterilized, sealed in leak-proof containers, and/or incinerated.

C8.3.6.1.8. Compaction

C8.3.6.1.8.1. Infectious medical waste will not be compacted unless converted to non-infectious medical waste by treatment as described in paragraph C8.3.6.6. Containers holding sharps will not be compacted.

C8.3.6.1.9. Spills

C8.3.6.1.9.1. Spills of infectious medical waste will be cleaned up as soon as possible in accordance with the following:

C8.3.6.1.9.2. Response personnel must comply with paragraph C8.3.6.1.5.

C8.3.6.1.9.3. Blood, body fluid, and other infectious fluid spills must be removed with an absorbent material that must then be managed as infectious medical waste.

C8.3.6.1.9.4. Surfaces contacted by infectious medical waste must be washed with soap and water and chemically decontaminated.

C8.3.6.2. Mixtures of infectious medical wastes and hazardous wastes will be handled as infectious hazardous waste under DoD 4160.21-M (Reference (j)) and are the responsibility of the generating DoD component. Priority will be given to the hazard that presents the greatest risk. DLA Disposition Services has no responsibility for this type of property until it is rendered noninfectious as determined by the appropriate DoD medical authority.

C8.3.6.3. Urban-Like Waste from Medical Facilities

C8.3.6.3.1. Urban-like waste from medical facilities can be disposed of as urban waste (see Medical Waste definition). Urban waste that is classified as hazardous waste shall be managed in accordance with the criteria applicable to hazardous waste.

C8.3.6.4. Radioactive Waste

C8.3.6.4.1. Radioactive medical waste will be segregated from other waste streams and managed in accordance with Service Directives.

C8.3.6.5. Sharps

C8.3.6.5.1. Needles will not be clipped, cut, bent, or recapped before disposal.

C8.3.6.6. Treatment

C8.3.6.6.1. Medical waste will be treated in accordance with Table 8.1.

C8.3.6.6.2. Disinfection and sterilization conducted at the waste generating facility are optional. Disinfection does not remove infectious characteristics from the waste; sterilization removes the infectious characteristics from the waste if it conforms to the following provisions:

C8.3.6.6.2.1. Sterilizers must maintain the temperature at 121°C (250°F) at 1 bar (15 psi) 40 to 45 minutes, or a temperature of 134 °C (273°F) for 15 to 20 minutes at 2 bar pressure (30 psi), whichever is available at the medical facility. Records of the sterilization shall be entered in a sterilization log book.

C8.3.6.6.2.2. The sterilization efficiency should reach a Sterility Assurance Level (SAL) value not lower than 10^{-6} .

C8.3.6.6.2.3. Sterilizers' effectiveness shall be validated prior to the initial use, after repairs, and at least every two years. Results of the validation test shall be recorded. The effectiveness of sterilizers must be checked at least weekly using *Bacillus stearo thermophilus* spore strips or an equivalent biological performance test. Results of the tests shall be recorded in the sterilization log book.

C8.3.6.6.3. Sterilization or disinfection conducted at the waste-generating medical facility does not require an authorization, provided it treats waste coming from that medical facility only. Prior to initial operation, medical facilities conducting sterilization or disinfection of their medical waste shall provide notification to the Italian Base Commander.

C8.3.6.6.4. Incineration of infectious waste may be performed in dedicated incinerators or in urban waste incineration plants or special waste incineration plants, provided infectious waste is not mixed with other waste prior to being introduced in the kiln eye and the plant feeding system does not involve direct contact between the operators and the waste.

C8.3.6.6.5. Incineration of infectious waste presenting hazardous characteristics other than the infectious characteristic shall only be performed in authorized hazardous waste incineration plants.

C8.3.6.6.6. Sterilized medical waste may be shipped to the following treatment plants:

C8.3.6.6.6.1. Non-hazardous waste landfills. Landfilling of sterilized infectious medical waste is authorized only in the absence of an incinerator in the Region where the waste is generated and it requires the prior approval of the President of the Region.

C8.3.6.6.6.2. Urban waste incineration plants.

C8.3.6.6.6.3. Special waste incineration plants.

C8.3.6.6.6.4. Refuse derived fuel (RDF) production plants.

C8.3.6.6.6.5. Authorized plants which use medical waste for energy recovery.

C8.3.6.6.7. Only authorized incinerators shall be used to treat hazardous medical waste (see Chapter 6, "Hazardous Waste"). The incinerator 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, "Air Emissions."

C8.3.6.6.8. Ash or residue from the incineration of infectious medical waste is classified as hazardous waste and shall be managed accordingly.

C8.3.6.7. Contingency Plans

C8.3.6.7.1. Installations will develop contingency plans for treatment or disposal of infectious medical waste should the primary means become inoperable.

Table 8.1. Treatment & Disposal Methods for Medical Waste

Type of Medical Waste	Waste Category (see Definitions)	Waste Code ¹	Method of Final Treatment and Disposal
Identifiable anatomic parts	Infectious medical waste (medical waste requiring particular disposal procedures)	18 01 03*	Cremation or incineration followed by burial
Non-identifiable anatomic parts	Infectious medical waste (medical waste requiring particular disposal procedure)	18 01 03*	Cremation or incineration followed by burial
Sterilized medical waste	Medical waste assimilated to urban waste.	20 03 01	Incineration or Landfill for Non-hazardous waste. Landfilling of sterilized infectious medical waste is authorized only in the absence of an incinerator in the Region where the waste is generated and it requires the prior approval of the President of the Region.
	Medical waste not assimilated to urban waste.	19 12 10	Refuse derived fuel (RDF) production plants or to any plant that can use the waste for energy production
Small animals used for testing from laboratories and veterinary offices	Medical waste requiring particular disposal procedure	18 02 02*	Incineration
Tissues, organs, bulk blood & suction canister waste	Infectious medical waste (medical waste requiring particular disposal procedure)	18 01 03*	Incineration
Microbiological wastes; potentially infectious sharps; materials contaminated by infected feces, urine, or any other infected biological liquid	Infectious medical waste – human	18 01 03*	Incineration
	Infectious medical waste – animal	18 02 02*	
Waste from maternity, diagnosis and medicinal wards which require precautions to prevent exposure to infectious agents and isolation wards	Infectious medical waste	18 01 03*	Incineration
Waste from veterinary services which require precautions to prevent exposure to infectious agents	Infectious medical waste	18 02 02*	Incineration
Samples of urine or feces (if not infected)	--	--	Decant into clinical sinks
Expired and non-used	Non-infectious medical waste	18 01 09	Incineration

Type of Medical Waste	Waste Category (see Definitions)	Waste Code ¹	Method of Final Treatment and Disposal
pharmaceuticals (other than cytotoxic and cytostatic drugs)	(medical waste requiring particular disposal procedure) – human		
	Non-infectious medical waste (medical waste requiring particular disposal procedure) – animal	18 02 08	
Cytotoxic and cytostatic drugs	Medical waste requiring particular disposal procedure – human	18 01 08*	Incineration
	Medical waste requiring particular disposal procedure – animal	18 02 07*	
Empty glass containers of drugs and solutions for infusion (other than those previously containing antiblastic drugs, contaminated with biological or radioactive materials, or from segregated infectious patients)	Non-infectious medical waste	15 01 07	Urban waste disposal and recycling plants
Chemicals consisting of or containing dangerous substances	Hazardous medical waste – human	18 01 06*	Hazardous waste disposal, treatment, and recycling plants
	Hazardous medical waste – animal	18 02 05*	
Chemicals other than those containing dangerous substances	Non-hazardous medical waste – human	18 01 07	Waste disposal, treatment, and recycling plants
	Non-hazardous medical waste – animal	18 02 06	
Waste oils, accumulators and batteries, fluorescent lamps	Hazardous medical waste	As per appropriate corresponding hazardous waste stream	Hazardous waste disposal, treatment, and recycling plants
Unused sharps	Non-infectious medical waste – human	18 01 01	Waste disposal, treatment, and recycling plants
	Non-infectious medical waste – animal	18 02 01	
Bulky and non-bulky materials	Non-hazardous medical waste or medical waste “comparable to urban waste”	As per appropriate corresponding non-hazardous waste stream	Waste disposal, treatment, and recycling plants

Type of Medical Waste	Waste Category (see Definitions)	Waste Code ¹	Method of Final Treatment and Disposal
Inert construction materials and orthopedic casts	Non-hazardous medical waste or medical waste “comparable to urban waste”	18 01 04	Waste disposal and recycling plants
Food residues from kitchens and catering activities, empty packaging, plasters, non-returnable sheets and clothes, medical towels, bandages, bags for urine collection (excluding those from infectious wards).	Medical waste “comparable to urban waste.”	As per appropriate corresponding non-hazardous waste stream	Waste disposal, treatment, and recycling plants
Materials from gardening activities at medical facilities	Medical waste “comparable to urban waste.”	20 02 01	Waste disposal, treatment, and recycling plants

Note 1: Any waste marked with an asterisk (*) is considered a hazardous waste (European List of Wastes).

C9. CHAPTER 9PETROLEUM, OIL, & LUBRICANTSC9.1. 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 (UST) containing POL or hazardous material products are addressed in Chapter 19, “Underground Storage Tanks.” POL spill prevention and response planning criteria are contained in Chapter 18, “Spill Prevention & Response Planning.”

C9.2. DEFINITIONS

C9.2.1. Aboveground Storage Container. POL storage containers, exempt from UST criteria, that are normally placed on or above the surface of the ground. POL storage containers located above the floor and contained in vaults or basements, bunkered containers, and also partially buried containers are considered aboveground storage containers. For the purposes of this Chapter, this includes any mobile or fixed structure, tank, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, and oil distribution. This also includes equipment in which oil is used as an operating fluid, but excludes equipment in which oil is used solely for motive power.

C9.2.2. Below Ground Storage Container. Completely buried POL storage containers, including deferred USTs, that are exempt from all criteria in Chapter 19, “Underground Storage Tanks.” For purposes of this definition, ONLY below ground storage containers that are exempt from requirements of Chapter 19 are counted toward the aggregate thresholds in definition of POL facility below.

C9.2.3. Loading/Unloading Racks. Location where tanker trucks/rail cars are loaded and unloaded by pipes, pumps, and loading arms.

C9.2.4. Loading/Unloading Areas. Any location where POL is authorized to be loaded or unloaded to or from a POL storage container.

C9.2.5. Pipeline Facility. Includes new and existing pipes, pipeline rights of way, auxiliary equipment (e.g., valves and manifolds), and buildings or other facilities used in the transportation of POL.

C9.2.6. POL. Refined petroleum, oils, and lubricants, including, but not limited to, petroleum, fuel, lubricant oils, synthetic oils, mineral oils, animal fats, vegetable oil, sludge, and POL mixed with wastes other than dredged spoil.

C9.2.7. POL Facility. An installation with either:

C9.2.7.1. An aggregate aboveground storage container capacity (excluding below ground storage containers) of $\geq 5,000$ liters (1,320 gallons); or

C9.2.7.2. An aggregate below ground storage container capacity of $\geq 159,091$ liters (42,000 gallons); or

C9.2.7.3. A pipeline facility as identified in the definition above.

C9.2.8. POL Storage Container. POL containers with capacities > 208 liters (55 gallons) (mobile/portable and fixed; and above and below ground storage containers). USTs required to meet all requirements of Chapter 19 are EXCLUDED from the definition of POL storage containers.

C9.3. CRITERIA

C9.3.1. Applicability. The below criteria apply only at POL Facilities as defined above.

C9.3.2. General POL Storage Container Criteria

C9.3.2.1. Inspection and Testing. Inspection and testing shall be conducted on all POL storage containers in accordance with recognized industry standards.

C9.3.2.2. Secondary Containment. POL storage containers must be provided with a secondary means of containment (e.g., dike) capable of holding the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation and expansion of product. Alternatively, POL storage containers that are equipped with adequate technical spill and leak prevention options (such as overfill alarms and flow shutoff or restrictor devices) may provide secondary containment by use of a double wall container. Below ground storage containers may meet this criterion by use of a leak barrier with a leak detection pipe and basin. A licensed technical authority may waive this secondary containment criteria for below ground storage containers.

C9.3.2.3. Permeability. Permeability for containment areas will be a maximum of 10^{-7} cm/sec.

C9.3.2.4. Containment Area Drainage. Drainage of stormwater from containment areas will be controlled by a valve that is locked closed when not in active use. Stormwater will be inspected for petroleum sheen before being drained from containment areas. If a petroleum sheen is present it must be collected with sorbent materials prior to drainage, or treated using an oil-water separator. Disposal of sorbent material exhibiting the hazardous characteristics in Appendix B.1 will be in accordance with Chapter 6, "Hazardous Waste."

C9.3.2.5. Valves and Piping. All aboveground valves, piping, and appurtenances associated with POL storage containers shall be periodically inspected in accordance with recognized industry standards.

C9.3.3. Additional POL Storage Container Criteria

C9.3.3.1. Testing. Buried Piping associated with POL storage containers shall be tested for integrity and leaks at the time of installation, modification, construction, relocation, or replacement. New buried piping must be protected against corrosion in accordance with recognized industry standards.

C9.3.3.2. Storage Container Design. POL storage containers shall be designed or modernized in accordance with good engineering practice to prevent unintentional discharges by use of overflow prevention devices.

C9.3.3.3. Completely and Partially Buried Metallic POL Storage Containers. These must be protected from corrosion in accordance with recognized industry standards.

C9.3.4. Storage Container Wastes

C9.3.4.1. POL container cleaning wastes frequently have hazardous characteristics (as defined in Appendix B.1) and must be handled and disposed of in accordance with requirements of Chapter 6, "Hazardous Waste." POL container waste and handling procedures include:

C9.3.4.2. POL container cleaning wastes (sludge and washwaters) must be disposed of in accordance with the criteria of Chapter 6, "Hazardous Waste" or Chapter 7, "Solid Waste," as applicable.

C9.3.4.3. POL container bottom waters, which are periodically drained, must be collected and disposed of in accordance with Chapter 6, "Hazardous Waste" or Chapter 7, "Solid Waste," as applicable.

C9.3.5. General Transport and Distribution Criteria

C9.3.5.1. Loading/Unloading Racks and Areas

C9.3.5.1.1. Secondary Containment. Loading/unloading racks shall be designed to handle discharges of at least the maximum capacity of any single compartment of a rail car or tank truck loaded or unloaded at the loading/unloading rack.

C9.3.5.1.2. Departing Vehicle Warning Systems. Provide an interlocked warning light or physical barrier system, warning signs, wheel chocks, or vehicle break interlock system at loading/unloading racks to prevent vehicles from departing before complete disconnection of flexible or fixed oil transfer lines.

C9.3.5.1.3. Vehicle Inspections. Prior to filling and prior to departure of any tank car or tank truck, closely inspect for discharges from the lowermost drain and all outlets of such vehicles, and if necessary, ensure that they are tightened, adjusted, or replaced to prevent liquid discharge while in transit.

C9.3.5.1.4. Loading/Unloading Areas. Provide appropriate containment and / or diversionary structures (dikes, berms, culverts, spill diversion ponds, etc.) or equipment (sorbent

materials, weirs, booms, other barriers etc.) at loading/unloading areas to prevent a discharge of POL which reasonably could be expected to cause a sheen on waters of Italy defined in Chapter 4, "Wastewater."

C9.3.5.2. POL Pipeline Facilities

C9.3.5.2.1. Provisions for Testing and Maintenance. All pipeline facilities carrying POL must be tested and maintained in accordance with recognized industry standards, including:

C9.3.5.2.1.1. Each pipeline operator handling POL will prepare and follow a procedural manual for operations, maintenance and emergencies.

C9.3.5.2.1.2. Each new pipeline facility and each facility in which pipe has been replaced or relocated must be tested in accordance with recognized industry standards, without leakage before being placed in service.

C9.3.5.2.1.3. All new POL pipeline facilities must be designed and constructed to meet recognized industry construction standards.

C9.3.6. Personnel Training. At a minimum, all personnel handling POL shall be trained annually in the operation and maintenance of equipment to prevent discharges; discharge procedure protocols; general facility operations; and the applicable contents of the facility Spill Plan.

C10. CHAPTER 10

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C11. CHAPTER 11

PESTICIDES

C11.1. SCOPE

This Chapter contains criteria regulating the use, storage, and handling of pesticides, but does not address the use of these materials by individuals acting in an unofficial capacity in a residence or garden. The disposal of pesticides is covered in Chapter 6, “Hazardous Waste” and Chapter 7, “Solid Waste.”

C11.2. DEFINITIONS

C11.2.1. Certified Pesticide Applicators. All personnel who apply pesticides and who have been formally certified in accordance with DoD Manual 4150.07-M, “Volume 1 DoD Pest Management Training: The DoD Plan for the Certification of Pesticide Applicators” (which accepts Italian certification in appropriate circumstances). Local nationals applying pesticides classified as toxic or very toxic or harmful shall also hold a valid Italian authorization.

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, material, 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. Local National. A DoD employee hired under Italian employment conditions.

C11.2.4. 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.

C11.2.5. 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.

C11.2.6. Pesticide. Any substance or mixture of substances, including biological control agents, that may prevent, destroy, repel, or mitigate pests. Pesticide generally refers to insecticides, rodenticides, herbicides, and other chemicals used to control pests and undesirable vegetation.

C11.2.7. Pesticide Waste. Materials subject to pesticide disposal restrictions including:

C11.2.7.1. Any pesticide that has been identified by the pest management consultant as cancelled under U.S. or Italian authority;

C11.2.7.2. Any pesticide that does not meet specifications, is contaminated, has been improperly mixed, or otherwise unusable, whether concentrated or diluted;

C11.2.7.3. Any material used to clean up a pesticide spill; or

C11.2.7.4. Any containers, equipment, or material contaminated with pesticides; empty pesticide containers shall be disposed of in accordance with C11.3.12.

C11.2.8. Registered Pesticide. A pesticide that has been registered and approved for sale or use within the United States or Italy.

C11.2.9. Toxic, Very Toxic, or Harmful Pesticides. Dangerous pesticides presenting the following hazardous characteristics:

C11.2.9.1. Very toxic (symbol T⁺ on labels): pesticides which in very low quantities cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;

C11.2.9.2. Toxic (symbol T on labels): pesticides which in low quantities cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin;

C11.2.9.3. Harmful (symbol Xn on labels): pesticides which may cause death or acute or chronic damage to health when inhaled, swallowed or absorbed via the skin.

C11.3. CRITERIA

C11.3.1. Pesticide Application Records

C11.3.1.1. All pesticide applications (excluding arthropod repellents on skin and clothing) will be recorded daily, using DD Form 1532-1 (Pest Management Maintenance Report) or a computer-generated equivalent. The Pest Management Maintenance Report has been assigned Report Control Symbol DD-A&T(A&AR)1080 in accordance with DoD 8910-M "DoD Procedures for Management of Information Requirements." These records will be:

C11.3.1.1.1. Submitted at least quarterly to the Pest Management Consultant; and

C11.3.1.1.2. Archived for permanent retention in accordance with specific service procedures.

C11.3.1.2. The following additional information shall be included:

C11.3.1.2.1. For non-agricultural use: reason for application; and

C11.3.1.2.2. For stored vegetal foodstuff: used equipment and/or method, reason for application.

C11.3.1.2.3. Local National certified pesticide applicators shall also record their pesticide application information related to food and crops in a Pesticide Application Register. The register shall be signed by the pesticide applicator and shall remain at the user site or in the administrative office.

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. Italian regional pesticide limitations shall be incorporated into the plan.

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 that are not classified as toxic, very toxic or harmful 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 that are not classified as toxic, very toxic or harmful.

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 that are on the list approved by the Armed Forces Pest Management Board (AFPMB) that have Italian approved equivalents (i.e., same manufacturer and same formulations), or Italian 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, "Spill Prevention & Response Planning.")

C11.3.8. Pest management facilities, including mixing and storage areas, will comply with Armed Forces Pest Management Board Technical Guide No. 17, "Military Handbook - Design of Pest Management Facilities."

C11.3.9. All pesticide applications will be in accordance with guidance given on the pesticide label. Labels of U.S. products will bear the appropriate use instructions and precautionary message based on the toxicity category of the pesticide ("danger/pericolo," "warning/attenzione," or "caution/avvertimento"). If Local Nationals will be using the

pesticides, the precautionary messages and use instructions will be in English and Italian. Pesticides classified as hazardous chemicals shall be labeled in accordance with C5.3.7.

C11.3.10. Safety Data Sheets (SDSs) and labels for all pesticides will be available at the storage and holding facility. SDSs for pesticides classified as hazardous chemicals shall meet the requirements of C5.3.5. and shall be maintained in accordance with C5.3.6.

C11.3.11. Pesticide storage areas will contain a readily-visible current inventory of all items in storage and should be regularly inspected and secured to prevent unauthorized access. Pesticide derived waste awaiting disposal shall be stored and labeled in accordance with Chapter 6, "Hazardous Waste," and either segregated from pesticide products or transferred to a waste accumulation point or storage area (see Chapter 6).

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:

C11.3.12.1. The generator of pesticide wastes will determine whether or not the waste is hazardous, in accordance with Chapter 6, "Hazardous Waste."

C11.3.12.2. Pesticide waste determined to be hazardous waste will be disposed of in accordance with the criteria for hazardous waste disposal in Chapter 6, "Hazardous Waste."

C11.3.12.3. Pesticide waste that is determined not to be a hazardous waste will be disposed of in accordance with the label instructions, through DLA Disposition Services. Empty pesticide containers shall not be reused.

C12. CHAPTER 12HISTORIC & CULTURAL RESOURCESC12.1. 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 Italy'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 remains, 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, affected 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 Resources. 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, and also includes natural resources (plants, animals, landscape features, etc.) that may be considered important as a part of a country's traditional culture and history. The

term also includes any property listed on the World Heritage List or the Italian equivalent of the National Register of Historic Places. Italian lists of properties should be evaluated to determine if they are equivalent with the National Register of Historic Places prior to application.

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 archeological sites, the protective measure may be temporary or permanent.

C12.2.10. Restoration Professional. A person performing a historic or cultural resources function is called a “restorer” and is defined as the professional person that defines the conservation status and performs a series of actions (both direct and indirect) for the limitation of the degradation processes affecting the materials of which such resources are made. In this way the professional contributes to the conservation and to the preservation of the historical and cultural value. Such professional can be:

C12.2.10.1. A person with a Degree of a National Restoration School.

C12.2.10.2. A person with a Degree of a Regional Restoration School and two years of experience in the restoration field.

C12.2.10.3. A person with 8 years of experience in the restoration field.

C12.3. CRITERIA

C12.3.1. U.S. Installation Commanders shall take into account the effect of any action on any property listed on the World Heritage List or on Italy'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 Italian equivalent of the National Register of Historic Places (<http://www.beniculturali.it/mibac/opencms/MiBAC/sito-MiBAC/MenuPrincipale/LuoghiDellaCultura/Ricerca/index.html>).

C12.3.3. U.S. 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. Restoration activities shall only be conducted by a qualified restoration professional.

C12.3.4. Installations shall, after coordination with the Italian Base Commander, prepare, maintain, and implement a cultural resources management plan that contains information needed to make appropriate decisions about cultural and historic resources identified on the installation inventory, and for mitigation of any adverse effects.

C12.3.5. Installations shall, after coordination with the Italian Base Commander, and if financially and otherwise practical:

C12.3.5.1. Inventory historic and cultural resources in areas under DoD control. An inventory shall be developed from a records search and visual survey. Cultural resources indicated in Table 12.1 shall also be considered.

C12.3.5.2. Establish measures sufficient to protect known historic or cultural resources until appropriate mitigation or preservation can be completed.

C12.3.5.3. Establish measures sufficient to protect known archeological resources until appropriate mitigation or preservation can be completed.

C12.3.6. U.S. Installation Commanders shall establish measures to prevent DoD personnel from disturbing, transferring, removing, transporting or relocating historic or cultural resources without obtaining an authorization through the Italian Base Commander (see Chapter 1 for process).

C12.3.7. U.S. Installation Commanders shall ensure that planning for major actions includes consideration of possible effects on historic or cultural resources.

C12.3.8. If potential historic or cultural resources not previously inventoried are discovered in the course of a DoD action, the U.S. Installation Commander and the Italian Base Commander shall be notified immediately. The newly discovered items will be preserved and protected pending a decision on final disposition by the U.S. Installation Commander. The decision on final disposition will be made by the U.S. Installation Commander after coordination with the Italian Base Commander or similar appropriate Italian authorities.

Table 12.1. Cultural and Historic Resources

1. The definition of cultural resources apply to all items that belong to State, Regions and other public institutions and private subjects without profit goals, presenting artistic, historic, archeological and ethno-anthropological interest.
2. In addition, the following items presenting artistic, historic, archeological and ethno-anthropological interest are also considered cultural resources: a. The collections of museums, art galleries, and galleries and all the other exhibitions belonging to State, Regions and other public institutions. b. The archives and the single documents belonging to State, Regions and other public institutions. c. The book collections of the libraries of State, Regions and other public institutions.
3. In addition to the previous points the following are also considered cultural resources, after their notification to the public authorities: a. All the items (not previously mentioned at points 1 and 2) with a particular interest from an artistic, historic archeological and ethno-anthropological point of view. b. The archives and the single documents belonging to private subjects and characterized by a particularly important historic interest. c. The book collections belonging to private subjects characterized by an exceptional cultural interest. d. All those items, to whoever they belong, characterized by a particularly important interest in relation to their political, military, literature, artistic and cultural interest including those coming from the history of public, community and religious institutions. e. The collections of objects, to whoever they belong, that due to their tradition, fame and particular environmental features, symbolize an exceptional artistic and historic interest.
4. For those resources listed at point 1 and point 3 letter a: a. Items regarding paleontology, prehistory and the primitive civilizations. b. Numismatic items. c. Manuscripts, autographs, letters, incunabula, books, printings, engravings, and their matrices characterized for their value and rarity. d. Geographical maps and musical scores characterized for their value and rarity. e. Photographs and related negatives and matrices, films and general audiovisual equipment characterized for their value and rarity. f. Villas, parks and gardens characterized for their historic and artistic value. g. Public squares, places, streets and other open urban spaces characterized for their historic and artistic value. h. Mining sites characterized for their historic and ethno-anthropological interest. i. Boats and ships characterized for their historic, artistic and ethno-

anthropological interest. j. Various typologies of rural architecture characterized for their historic and ethno-anthropological interest and as a heritage of traditional rural economy.
5. Other resources subject to specific preservation disposition a. Frescos, coats of arms, graffiti, tombstones, inscriptions, tabernacles, and other decorations for buildings not displayed to the public. b. Studios of artists. c. Public areas. d. Paintings, sculptures, graphical works and all the other artistic objects created less than 50 years ago by a living artist. e. Contemporary architectural works of particular artistic value. f. Photographs and their related negatives and matrices, films and general audiovisual equipment older than 25 years. g. Transportation vehicles older than 75 years. h. Items and instruments with a history, science and technology interest older than 50 years. i. Ruins identified according to the applicable legislation for the protection of national historic heritage.

C13. CHAPTER 13NATURAL RESOURCES & ENDANGERED SPECIESC13.1. 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 U.S. or Italian governments.

C13.2. DEFINITIONS

C13.2.1. Area Subject to Landscape Protection. These areas include:

C13.2.1.1. Premises with relevant public interest. Environmental resources (i.e., gardens, parks, landscapes) which stand out for their particular beauty, historical and cultural relevance.

C13.2.1.2. Environmental resources which fall under the following categories:

C13.2.1.2.1. First 300 m (984 ft) of territory from sea's edge;

C13.2.1.2.2. First 300 m (984 ft) of territory from lake's edge;

C13.2.1.2.3. Rivers, torrents and water bodies, including the first 150 m (492 ft) from their edge;

C13.2.1.2.4. Part of mountains beyond 1,600 m (5,249 ft) for Alps and beyond 1,200 m (3,937 ft) for Apennines and Italian islands;

C13.2.1.2.5. Glaciers;

C13.2.1.2.6. National or regional reserves and parks, including applicable buffer areas;

C13.2.1.2.7. Woodland and forests;

C13.2.1.2.8. Wetlands;

C13.2.1.2.9. Volcanoes; and

C13.2.1.2.10. Archeological areas.

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. Italian Protected Species. Any species of flora or fauna listed or designated by Italy, because continued existence of the species 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 Habitat. Terrestrial or aquatic zones that may be identified on the basis of their geographic, abiotic and biotic, totally natural, or seminatural characteristics.

C13.2.6. Natural Resource. All living and inanimate materials supplied by nature that are of aesthetic, ecological, educational, historical, recreational, scientific, or other value; any physical, geological, geomorphological, and biological formation that has relevant natural and environmental value.

C13.2.7. Natural Resources Management. Actions taken that combine science, economics, and policy, to study, manage, and restore natural resources to strike a balance with the needs of people and the ability of the ecosystem to support soil, water, forest, fish, wildlife and coastal resources.

C13.2.8. Significant Land or Water Area. Land or water area that is normally ≥ 202 hectares (500 acres) outside the cantonment area; areas of smaller size are included if they have natural resources that are especially vulnerable to disturbance.

C13.2.9. Threatened and Endangered Species. Any species of flora or fauna, listed in Table 13.1 or included in the European or Italian lists of specially protected and strictly protected species. The websites below provide links to the European and Italian lists:

C13.2.9.1. EU Red List for Species-
http://ec.europa.eu/environment/nature/conservation/species/redlist/index_en.htm

C13.2.9.2. Fauna -
http://www.minambiente.it/home_it/menu.html?mp=/menu/menu_attivita/&m=argomenti.html%7Cbiodiversita_fa.html%7CPubblicazioni_banche_dati.html%7CRepertorio_della_fauna_italiana_protetta.html#elenco

C13.2.9.3. Flora -
http://www.minambiente.it/home_it/menu.html?mp=/menu/menu_attivita/&m=argomenti.html%7Cbiodiversita_fa.html%7CPubblicazioni_banche_dati.html%7CRepertorio_della_flora_italiana_protetta.html#elenco

C13.3. CRITERIA

C13.3.1. Protection of Species & Habitats

C13.3.1.1. Installations that have land and water areas shall take reasonable steps to protect and enhance known endangered or threatened species and Italian protected species and their habitats

C13.3.1.2. The following activities are prohibited for Italian protected animal and plant species (see C13.2.9. and Table 13.1):

- C13.3.1.2.1. The capture or killing of the species in its natural habitat;
- C13.3.1.2.2. The disturbance of the species during its reproductive cycle, hibernation, or migration;
- C13.3.1.2.3. The destruction or collection of eggs or nests;
- C13.3.1.2.4. The damage or destruction of the sites used for reproduction or rest;
- C13.3.1.2.5. To pick up, collect, uproot, or destroy any specimen of the plant species;
- C13.3.1.2.6. To possess, transport, or trade any specimen of the plant species; and
- C13.3.1.2.7. Operations to be undertaken in an area subject to landscape protection under the Regional landscape zoning plan shall be authorized. The request for an authorization will be submitted to the Italian Base Commander (see Chapter 1 for the process).
- C13.3.1.2.8. And the following activities are prohibited within the Circeo National Park:

- C13.3.1.2.8.1. Capture, killing, or disturbing of animal species;
- C13.3.1.2.8.2. Collection or destruction of plant species;
- C13.3.1.2.8.3. Introduction of plants different from indigenous species;
- C13.3.1.2.8.4. Modification of surface hydro regime;
- C13.3.1.2.8.5. Modification of existing marine or terrestrial caves;
- C13.3.1.2.8.6. Creation of quarries, landfill or mines;
- C13.3.1.2.8.7. Taking samples with major archeological or geological interest;
- C13.3.1.2.8.8. Destruction, modification of biogeochemical cycles;
- C13.3.1.2.8.9. Introduction of weapons by a private citizen;
- C13.3.1.2.8.10. Camping outside of dedicated areas;
- C13.3.1.2.8.11. Driving off roads; and
- C13.3.1.2.8.12. Advertising without an authorization.

C13.3.2. Installations shall maintain, or have access to Table 13.1 and the websites listed in C13.2.9.

C13.3.3. Installations with significant land or water areas shall, after coordination with the Italian Base Commander or similar appropriate Italian authorities, develop natural resources management plans.

C13.3.4. Installations with natural resources management plans shall, after coordination with the Italian Base Commander or similar appropriate Italian 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. Conduct a survey to determine the presence of any threatened or endangered species or Italian-protected species, or support Italian surveys.

C13.3.4.2. Implement natural resources management plans.

C13.3.5. The Italian Base Commander, or if there is no Italian Base Commander the U.S. Ambassador, will be notified (via the Component chain of command, who will also notify the DoD LEC) of the discovery of any endangered or threatened species and Italian 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 Italian 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, Italian 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 flora and fauna.

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 13.1. Selected European-Listed Endangered & Threatened Species

Common Name	Scientific Name	OCONUS Country of Listing
Mammals		
Bear, brown	<i>Ursus arctos arctos</i>	Italy
Chamois, Apennine	<i>Rupicapra rupicapra ornata</i>	Italy
Chimpanzee	<i>Pan troglodytes</i>	Wherever found in the wild
Ibex, Pyrenean	<i>Capra pyrenaica pyrenaica</i>	Spain
Lion, Asiatic	<i>Panthera leo persica</i>	Turkey
Lynx, Spanish	<i>Felis pardina</i>	Spain
Urial	<i>Ovis musimon ophion</i>	Cyprus
Birds		
Bullfinch, Sao Miguel (finch)	<i>Pyrrhula pyrrhula murina</i>	Eastern Atlantic Ocean - Azores
Eagle, Spanish imperial	<i>Aquila heliaca adalberti</i>	Spain
Falcon, Eurasian peregrine	<i>Falco peregrinus peregrinus</i>	Europe, Eurasia south to Africa and Mideast
Gull, Audouin's	<i>Larus audouinii</i>	Mediterranean Sea
Ibis, northern bald	<i>Geronticus eremita</i>	Southern Europe
Pigeon, Azores wood	<i>Columba palumbus azorica</i>	East Atlantic Ocean - Azores
Tern, roseate	<i>Sterna dougallii dougallii</i>	Tropical and temperate coasts of Atlantic Basin and East Africa
Reptiles		
Lizard, Hierro giant	<i>Gallotia simonyi simonyi</i>	Spain (Canary Islands)
Lizard, Ibiza wall	<i>Podarcis pityusensis</i>	Spain (Balearic Islands)
Sea turtle, green	<i>Chelonia mydas</i>	circumglobal in tropical and temperate seas and oceans
Sea turtle, Kemp's ridley	<i>Lepidochelys kempii</i>	Tropical and temperate seas in Atlantic Basin
Sea turtle, leatherback	<i>Dermochelys coriacea</i>	Tropical, temperate, and subpolar seas
Sea turtle, loggerhead	<i>Caretta caretta</i>	Circumglobal in tropical and temperate seas and oceans
Sea turtle, olive ridley	<i>Lepidochelys olivacea</i>	Circumglobal in tropical and temperate seas
Fishes		
Ala Balik (trout)	<i>Salmo platycephalus</i>	Turkey
Cicek (minnow)	<i>Acanthorutilus handlirschi</i>	Turkey

Note: This table does not include a complete list of Italian-designated threatened and endangered species. The links to the Italian and European lists are provided in C13.2.9.

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C14. CHAPTER 14POLYCHLORINATED BIPHENYLSC14.1. 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. Decontamination. Any operation conducted by an Italian-permitted company that allows the user to reuse, recycle, or eliminate equipment, substances, or fluids contaminated by PCB (including replacement of PCB fluids with adequate fluids that are PCB-free).

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 (98 feet) 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 < 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 PCB, but < 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 ≥ 50 ppm.

C14.2.15. PCB Transformer. Any transformer that contains ≥ 50 ppm PCB.

C14.2.16. Substantial Contact Area. An area that is subject to public access on a routine basis or which could result in substantial dermal contact by employees.

C14.2.17. PCBs. The term includes any combination of the following:

C14.2.17.1. polychlorinated biphenyls;

C14.2.17.2. polychlorinated triphenyls (PCTs);

C14.2.17.3. monomethyltetrachlorodiphenyl methane;

C14.2.17.4. monomethyldichlorodiphenyl methane; or

C14.2.17.5. monomethyldibromodiphenyl methane.

C14.3. CRITERIA

C14.3.1. General. The use of PCB items, except for existing transformers containing < 500 ppm of PCB, is prohibited. Use of transformers with < 500 ppm of PCB is allowed until the end of their lifetime

C14.3.1.1. Labeling

C14.3.1.1.1. All PCB items (including capacitors) containing > 5 cubic decimeters (dm^3) (5 liters or 1.32 gallons) of PCBs by volume, as well as items containing fluids with a PCB concentration > 50 ppm, shall be prominently labeled in English and Italian. This marking criterion also applies to transformers, rooms, vaults, and storage areas containing PCB

transformers or storing PCBs or PCB items for disposal. The doors to rooms where PCB items are located shall also be labeled.

C14.3.1.1.2. The label shall be accompanied by operating instructions specific to that item.

C14.3.1.1.3. The label should be ≥ 23 cm (9.1 inches) high by 17 cm (6.7 inches) wide, and should be divided into two parts. The top section (≥ 8 cm (3.1 inches) high) should contain the name of responsible party, hazard symbol, and risk (R-) and safety (S-) phrases. The symbol should be in black on an orange background. The lower section should contain the following information in black on a white background:

C14.3.1.1.3.1. Contains PCBs suspected to cause cumulative health effects in living organisms and to contaminate the environment.

C14.3.1.1.3.2. Avoid direct contact with liquids or vapors containing PCBs.

C14.3.1.1.3.3. Do not discharge waste containing PCBs in drains or gutters or on the ground.

C14.3.1.1.3.4. Use, control, or maintenance operations during normal and emergency periods, as well as disposal activities, shall be conducted according to Comitato Elettrotecnico Italiano (CEI) norms. In particular, inspections and/or emergency interventions following fires shall be conducted using a respirator equipped with cartridges to protect against hydrochloric acid and organic vapors. In addition, waste shall be collected in airtight metal containers and stored until final disposal.

C14.3.1.1.3.5. In case of abnormal functioning, consult the manufacturer.

C14.3.1.1.3.6. In case of spills of liquid containing PCBs call: _____

C14.3.1.1.3.7. In case of fire, call the fire department and notify that the fire involves PCB-containing item.

C14.3.1.1.3.8. Opening of the item is prohibited except by authorized persons.

C14.3.1.1.4. If the item contains fluids with PCB concentrations of 50 to 500 ppm, the label shall also state: "PCB contamination lower than 500 ppm."

C14.3.1.1.5. All decontaminated transformers should have a label that contains the following information:

C14.3.1.1.5.1. Fluids containing PCB have been replaced with: _____

C14.3.1.1.5.2. On date: _____

C14.3.1.1.5.3. By (name of the permitted company): _____

C14.3.1.1.5.4. PCB concentration (% by weight) of the replaced fluid: _____

C14.3.1.1.5.5. New fluid PCB concentration (% by weight): _____

C14.3.1.2. The installation spill contingency plan will address PCB items, including temporary storage items. Chapter 18, "Spill Prevention & Response Planning," provides criteria on how to prepare these plans.

C14.3.1.3. Notification of PCB spills shall follow the procedures in C18.3.4. Spills of PCB liquids at concentrations of ≥ 50 ppm will be responded to immediately upon discovery and cleaned up in accordance with the following:

C14.3.1.3.1. Surfaces that are located in substantial contact areas will be cleaned to 10 micrograms (μg) per 100 square centimeters (cm^2).

C14.3.1.3.2. Surfaces in all other contact areas will be cleaned to $100 \mu\text{g}/100 \text{ cm}^2$.

C14.3.1.3.3. Contaminated soil located in zones used for residential or recreational activities will be removed to a minimum depth of 25.4 cm (10 inches) or until the soil tests ≤ 0.06 ppm PCBs, whichever is deeper, and will be backfilled with clean soil containing < 0.001 ppm PCBs.

C14.3.1.3.4. Contaminated soil located in zones used for commercial/industrial activities will be removed until the soil tests no higher than 5 ppm PCBs and will be backfilled with clean soil containing < 1 ppm PCBs. All 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.

C14.3.1.3.5. Each installation having PCB items will maintain a written inventory that includes a current list by type of all PCB items in use and all PCB items placed into storage for disposal or disposed of for that year. Inventory records should be maintained for a period of time ≥ 3 years after disposal of the last item on the list. The installation shall provide this inventory to the Italian Base Commander biannually and within 10 days from the variation of the number of PCB items (see Chapter 1 for the process).

C14.3.1.3.6. PCB transformers shall be used only if in good working order and not leaking. The installation shall notify the Italian Base Commander in writing of the status of the transformers (see Chapter 1 for the process). Without such written notification the transformers shall be immediately decontaminated or disposed of.

C14.3.1.3.7. PCB items shall be disposed of in accordance with C14.3.4.

C14.3.1.3.8. 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 or for 5 years from the date of the last inspection, whichever is longer.

C14.3.2. PCB Transformers (≥ 500 ppm PCB)

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/emergency service provider.

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 managed as follows:

C14.3.2.5.1. Transformers classified as PCB-contaminated electrical equipment shall only be serviced with dielectric fluid containing < 50 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 from transformers cannot be reused. They shall be disposed of in accordance with C14.3.4.

C14.3.2.5.4. The use (or reuse) of fluids containing PCBs at concentrations ≥ 50 ppm is prohibited. Any PCB fluids that are removed from PCB transformers shall be disposed of in accordance with C14.3.4.

C14.3.2.6. All in-service PCB transformers will be inspected at least every 3 months except for PCB transformers with impervious, undrained secondary containment capacity of 100 % of dielectric fluid, which 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 in accordance with Chapter 18, "Spill Prevention & Response Planning."

C14.3.2.8. Leaking PCB transformers shall be repaired or replaced within 48 hours or as soon as possible after discovery of the leak. Leaking PCB transformers not repaired or replaced will be inspected daily until repaired or replaced. 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. Storage Prior to Disposal

C14.3.3.1. PCBs and PCB items stored prior to disposal are classified as hazardous waste.

C14.3.3.2. Storage prior to disposal of PCBs and transformers containing PCB at concentrations of ≥ 25 ppm requires an authorization. Installations shall provide sufficient information to the Italian Base Commander to seek an authorization (see Chapter 1 for the process). They will be stored in a facility that will assure the containment of PCBs, including:

C14.3.3.2.1. Roofs and walls of storage buildings that exclude rainfall;

C14.3.3.2.2. A containment berm, ≥ 15.24 cm (6 inches) high, sufficient to contain twice the internal volume of the largest PCB article or 25 % of the total internal volume of all PCB articles or containers stored, whichever is greater;

C14.3.3.2.3. Drains, valves, floor drains, expansion joints, sewer lines, or other openings constructed to prevent any release from the bermed area;

C14.3.3.2.4. Continuous, smooth, and impervious flooring material; and

C14.3.3.2.5. 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 there is a high possibility of such risks, the installation spill prevention and control plan will address the risk. In addition PCBs and transformers containing PCB at concentrations of ≥ 25 ppm shall be segregated from any flammable materials.

C14.3.3.3. Containers used for the storage of PCBs will be at least as secure as those required for their transport for disposal by DLA.

C14.3.4. Disposal

C14.3.4.1. PCB transformers shall be decontaminated or disposed of at the end of their effective lifetime.

C14.3.4.2. Waste PCB and PCB items are classified as hazardous waste and shall be disposed of in accordance with the criteria in Chapter 6, "Hazardous Waste." In addition the following disposal criteria apply:

C14.3.4.3. For in-country disposal, the following PCB items shall be delivered to an Italian-permitted company for disposal via incineration (which must meet a 99.9% combustion efficiency):

C14.3.4.3.1. PCB-contaminated dielectric fluid; and

C14.3.4.3.2. Rags, soils, and other PCB-contaminated debris.

C14.3.4.4. For in-country disposal, the following PCB items shall be delivered to an Italian-permitted company for decontamination or disposal via incineration (which must meet a 99.9% combustion efficiency):

C14.3.4.4.1. PCB transformers; and

C14.3.4.4.2. PCB containers.

C14.3.4.5. Retrogrades of PCB Items. DoD-generated PCB items manufactured in the United States will be returned to the United States for delivery to a permitted disposal facility if Italy or third country disposal is not possible, is prohibited, or would not be managed in an environmentally sound manner. Ensure that all PCB items and equipment are marked in accordance with the criteria in C14.3.1.1.

C14.3.5. Elimination of PCB Products

C14.3.5.1. Installations shall minimize the use of PCB transformers without degrading mission performance.

C14.3.5.2. Installations shall not purchase or otherwise take control of PCBs or PCB items for use.

C14.3.5.3. 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 (< 2 ppm) at the time of shipment.

C14.3.5.4. Such newly procured transformers and equipment shall have permanent labels affixed stating they are PCB-free (no detectable PCBs).

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C15. CHAPTER 15ASBESTOSC15.1. 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 DoDI 6055.1, "DoD Safety and Occupational Health (SOH) Program," and DoDI 6055.5, "Industrial Hygiene and Occupational Health," and relevant 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 coming from ACM are observed, 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, anthophyllite 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 asbestos.

C15.2.4. Friable Asbestos. Any material containing asbestos that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

C15.2.5. Category I Nonfriable ACM. Means asbestos-containing packings, gaskets, resilient floor covering, and asphalt roofing products.

C15.2.6. Category II Nonfriable ACM. Means any material, excluding Category I nonfriable ACM, containing asbestos that, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

C15.2.7. Regulated ACM. Means (a) Friable asbestos material, (b) Category I nonfriable ACM that has become friable, (c) Category I nonfriable ACM that will be or has been subjected to sanding grinding, cutting, or abrading, or (d) Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

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. A copy of the inventory will also be kept on permanent file. If friable ACM is detected, inventory results shall be submitted to the Italian Base Commander (see Chapter 1 for the process);

C15.3.2.2. A notification and education program to tell workers, tenants, and building occupants where potential 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. Friable ACM shall be assessed at least annually to determine if abatement is needed, and results shall be submitted to the Italian Base Commander;

C15.3.2.4. Work control/authorization systems to control activities that 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, abatement, workers' medical surveillance and waste disposal procedures;

C15.3.2.7. Training for the asbestos program manager as well as custodial and maintenance staff. Training should include the following:

C15.3.2.7.1. Asbestos properties and effects on human health;

C15.3.2.7.2. Types of products or materials containing asbestos;

C15.3.2.7.3. Operations which could lead to asbestos exposure;

C15.3.2.7.4. Safety procedures and personal protective equipment;

C15.3.2.7.5. Emergency procedures;

C15.3.2.7.6. Asbestos-containing waste disposal;

C15.3.2.7.7. Medical surveillance.

C15.3.2.8. Procedures to assess and prioritize identified hazards for abatement;

C15.3.2.9. Procedures to prevent the use of ACM in new construction.

C15.3.3. Determination Prior to Demolition or Renovation

C15.3.3.1. 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).

C15.3.3.2. The project authorization document will be furnished to the Italian Base Commander. Provide a copy of the plan a minimum of 30 days prior to start of the work.

C15.3.3.3. Prior to demolition or renovation of a facility that involves removing or disturbing friable ACM, a detailed work plan will be prepared and furnished to the U.S. installation commander and the Italian Base Commander a minimum of 30 days prior to start of the work. A copy of the work plan will also be kept on permanent file.

C15.3.3.4. Installations will remove friable ACM when the ACM poses a threat to release airborne asbestos fibers and cannot be reliably repaired or isolated. Removal activities will be conducted by permitted Italian companies.

C15.3.3.5. Before disturbing or demolishing a facility or part of a facility, installations will remove all regulated ACM. Prior to commencing the removal activities, a detailed work plan will be prepared and furnished to the U.S. installation commander and the Italian Base Commander a minimum of 30 days prior to start of the work. A copy of the work plan will also be kept on permanent file. Removal activities will be conducted by Italian-permitted companies.

C15.3.4. Disposal of ACM

C15.3.4.1. When disposing of asbestos waste, installations will adequately wet all ACM waste and seal it in a leak-proof double container: a polyethylene bag with adequate strength (> 0.15 mm (5.9 mils) thick) placed inside a second bag or a rigid container. Sharp-edged materials shall be packed separately. Bags shall not be filled over 2/3 of their capacity and shall not exceed 30 kg (66 pounds) of total weight.

C15.3.4.2. All containers shall be labeled to indicate the presence of asbestos. Containers will be labeled in English and Italian languages. The label shall contain the following text:

WARNING: CONTAINS ASBESTOS.
Breathing dust is dangerous to health.
Follow safety instructions.

PERICOLO: CONTIENE AMIANTO.
L'inalazione di fibre è dannosa alla salute.
Seguire le istruzioni di sicurezza.

C15.3.4.3. If the ACM waste contains crocidolite, the words "contains asbestos" shall be replaced by "contains crocidolite/blue asbestos – contiene crocidolite/amianto blu."

C15.3.4.4. The label shall be ≥ 5 cm (1.97 inches) high and 2.5 cm (0.98 inches) wide and shall have a large white "a" on a black background above the text (which is printed against a red background).

C15.3.4.5. ACM is a special waste. In-country disposal of ACM shall be conducted by permitted Italian companies according to the procedures in Chapter 6, "Hazardous Waste."

C15.3.4.6. Permanent records documenting the disposal action and site will be maintained.

C15.3.5. DoD schools will comply with applicable requirements of 15 U.S.C. 2643(l) and implementing regulations in 40 CFR Part 763, Subpart E, Asbestos-Containing Materials in Schools.

C16. CHAPTER 16

[RESERVED]

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C17. CHAPTER 17LEAD-BASED PAINTC17.1. 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 DoDI 6055.1, “DoD Occupational Safety and Health Program,” and DoDI 6055.5, “Industrial Hygiene and Occupational Health” and relevant 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, day-care 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 frequented by children under the age of 6.

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. Dust-Lead Hazard (previously defined as lead-contaminated dust). Surface dust in a residential dwelling or child-occupied facility that contains a mass-per-area concentration of lead $\geq 40 \mu\text{g}/\text{ft}^2$ on floors or $250 \mu\text{g}/\text{ft}^2$ on interior window sills based on wipe samples.

C17.2.8. Elevated Blood Lead Level. A confirmed concentration of lead in whole blood of $20 \mu\text{g}/\text{dl}$ (micrograms of lead per deciliter) for a single test, or of $15\text{-}19 \mu\text{g}/\text{dl}$ in two tests taken at least 3 months apart.

C17.2.9. 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.

C17.2.10. Enclosure. The use of rigid, durable construction materials that are mechanically fastened to the substrate 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.

C17.2.11. 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.

C17.2.12. Friction Surface. An interior or exterior surface that is subject to abrasion or friction, including but not limited to, window, floor, and stair surfaces.

C17.2.13. Hazard Reduction. Measures designed to reduce or eliminate human exposure to lead-based paint hazards through various methods including interim controls or abatement or a combination of the two.

C17.2.14. Impact Surface. An interior or exterior surface that is subject to damage by repeated sudden force, such as certain parts of doorframes.

C17.2.15. 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.

C17.2.16. Lead-Based Paint. Paint or other surface coatings that contain lead ≥ 1.0 milligram per cm^2 , or 0.5 % by weight or 5,000 ppm by weight.

C17.2.17. Lead-Based Paint Hazard. It includes paint-lead hazard, dust-lead hazard or soil-lead hazard, also defined in this list.

C17.2.18. 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.

C17.2.19. Paint-Lead Hazard. A paint-lead hazard is any of the following:

C17.2.19.1. Any lead-based paint on a friction surface that is subject to abrasion and where the lead dust levels on the nearest horizontal surface underneath the friction surface (e.g., the window sill, or floor) are equal to or greater than the dust-lead hazard levels identified in C17.2.7 above.

C17.2.19.2. Any damaged or otherwise deteriorated lead-based paint on an impact surface that is caused by impact from a related building component (such as a doorknob that knocks into a wall or a door that knocks against its doorframe).

C17.2.19.3. Any chewable lead-based painted surface on which there is evidence of teeth marks.

C17.2.19.4. Any other deteriorated lead-based paint in any residential building or child-occupied facility or on the exterior of any residential building or child occupied facility.

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.

C17.2.25. Soil-Lead Hazard (previously defined as lead-contaminated soil). Bare soil on residential real property or on the property of a child-occupied facility that contains total lead $\geq$ 400 ppm ($\mu\text{g/g}$) in a play area, or an average of 1,200 ppm of bare soil in the rest of the yard based on soil samples.

C17.3. CRITERIA

C17.3.1. Installations shall:

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 the screen identifies dust-lead levels $> 25 \mu\text{g}/\text{ft}^2$ for floors or $> 125 \mu\text{g}/\text{ft}^2$ for interior window sills, a lead-based paint risk assessment should be performed.

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 that occupant 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 the presence of any known lead-based paint or lead-based paint hazards to occupants of child-occupied facilities and military family housing and provide information on lead-based paint hazard reduction. In addition, installations shall 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. Conduct a characterization analysis in order to establish if the lead-containing waste is hazardous. Installations shall dispose of lead-contaminated waste that meets the definition of a hazardous waste in accordance with Chapter 6, "Hazardous Waste."

C17.3.2. Restrictions On Purchase and Use of Certain Lead-Containing Paints

C17.3.2.1. The use of lead carbonates, lead-hydrated carbonates, and lead sulfates as paint components is prohibited, with the exception of specialty paints authorized specifically for the restoration and maintenance of works of art or historic buildings (i.e., buildings listed on the Italian equivalent of the National Register of Historic Places; see C12.3.2.). Use of these substances in historic buildings shall be performed in accordance with the criteria in this Chapter.

C17.3.2.2. The use of paints containing lead and lead compounds at concentrations > 0.15% is prohibited on accessible surfaces.

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C18. CHAPTER 18SPILL PREVENTION & RESPONSE PLANNINGC18.1. SCOPE

This Chapter contains criteria to plan for, prevent, control, and report spills of POL and hazardous substances resulting from DoD activities. 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 DoDI 4715.8 “Environmental Remediation for DoD Activities Overseas” and EUCOM Directive 80-2 “Environmental Executive Agent Remediation Policy.”

C18.2. DEFINITIONS

C18.2.1. Aboveground Storage Container. POL storage containers, exempt from UST criteria, that are normally placed on or above the surface of the ground. POL storage containers located above the floor and contained in vaults or basements, bunkered containers, and also partially buried containers are considered aboveground storage containers. For the purposes of this Chapter, this includes any mobile or fixed structure, tank, equipment, pipe, or pipeline (other than a vessel or a public vessel) used in oil well drilling operations, oil production, oil refining, oil storage, oil gathering, oil processing, oil transfer, and oil distribution. This also includes equipment in which oil is used as an operating fluid but excludes equipment in which oil is used solely for motive power.

C18.2.2. Decontamination Wastes. Waste materials generated during the decontamination of equipment and personnel used during spill response including but not limited to purging water, rinsing water, plastic containers, rags, gloves, and other personal protective equipment.

C18.2.3. 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.

C18.2.4. Facility Response Team (FRT) (previously known as the Installation Response Team). A team performing emergency functions as defined and directed by the FIC.

C18.2.5. 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 A. Hazardous substances do not include:

C18.2.5.1. Petroleum, including crude POL or any fraction thereof, that is not otherwise specifically listed or designated as a hazardous substance above.

C18.2.5.2. Natural gas, natural gas liquids, liquefied natural gas, or synthetic gas usable for fuel (or mixtures of natural gas and such synthetic gas).

C18.2.6. Oil. Oil of any kind or in any form, including (but not limited to) petroleum, fuel POL, lube oils, animal fats, vegetable oil, sludge, POL refuse, and POL mixed with wastes other than dredged spoil.

C18.2.7. POL. Refined petroleum, oils, and lubricants. (See also definition in Chapter 9, “Petroleum, Oil, & Lubricants.”)

C18.2.8. Significant Spill. An uncontained release to the land or water in excess of any of the following quantities:

C18.2.8.1. For a hazardous wastes or hazardous substances identified as a result of inclusion in Appendix A, “List of Hazardous Substances & Materials,” any quantity in excess of the reportable quantity listed in Appendix A.

C18.2.8.2. For POL or liquid or semi-liquid hazardous material, hazardous waste, or hazardous substances, in excess of 400 liters (110 gallons);

C18.2.8.3. For other solid hazardous material, in excess of 225 kg (500 pounds);

C18.2.8.4. For combinations of POL and liquid, semi-liquid, and solid hazardous materials, hazardous waste, or hazardous substance, in excess of 340 kg (750 pounds); or

C18.2.8.5. 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.

C18.2.9. 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 in Appendix C, “Determination of Worst Case Discharge Planning Volume.”

C18.3. CRITERIA

C18.3.1. Spill Prevention Control and Reporting Plan Requirement. All DoD installations will prepare, maintain, and implement a Spill Prevention and Response Plan, which 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 should be kept in a location easily accessible to the FIC and FRT.

C18.3.1.1. The plan will be updated at least every 5 years or:

C18.3.1.1.1. Within 6 months of any significant changes to operations;

C18.3.1.1.2. When there have been two significant spills to navigable waters in any 12-month period;

C18.3.1.1.3. When there has been a spill of $\geq 1,000$ gallons.

C18.3.1.2. The plan shall be certified by an appropriately licensed or certified technical authority ensuring that the plan considers applicable recognized industry standards for spill prevention and environmental protection, that the plan is prepared in accordance with good engineering practice, and is adequate for the facility. Technical changes (i.e., non-administrative) to the plan require recertification.

C18.3.2. Prevention Section. The prevention section of the plan will, at 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 subparagraph C18.3.2.3., 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 subparagraph C18.3.2.3.

C18.3.2.5. Procedures for the periodic integrity testing of all aboveground storage containers, including visual inspection and where deemed appropriate, another form of non destructive testing. The frequency and type of inspection and testing must take into account container size and design (i.e., floating/fixed roof, skid-mounted, elevated, cut and cover, partially buried, vaulted above-ground, etc.) and recognized industry standards.

C18.3.2.6. Procedures for periodic inspection for all above ground valves, piping, and appurtenances associated with POL storage containers, in accordance with Chapter 9, "Petroleum, Oil, & Lubricants," subparagraph C9.3.2.5.

C18.3.2.7. 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.

C18.3.2.8. Means to Contact Emergency Services. The plan will include a telephone number or other means to contact the appropriate emergency services provider (e.g., installation fire department) on a 24-hour basis.

C18.3.2.9. 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 allow, 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.

C18.3.2.10. When secondary containment is not feasible for any container listed in the inventory, the plan shall include a detailed explanation of measures that will be taken to prevent spills (e.g., pre-booming, integrity testing, frequent inspection), as determined by the licensed or certified technical authority.

C18.3.2.11. 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.

C18.3.2.12. 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.

C18.3.2.13. 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.

C18.3.2.14. Written procedures for:

C18.3.2.14.1. Operations to preclude spills of POLs and hazardous substances;

C18.3.2.14.2. Inspections; and

C18.3.2.14.3. Record-keeping requirements.

C18.3.2.15. 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 (which 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. At a minimum, this section of the plan 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. The command structure that will be established to manage a worst case discharge. Include an organization chart and the responsibilities and composition of the organization.

C18.3.3.5. Procedures for FRT alert and response to include provisions for:

C18.3.3.5.1. Access to a reliable communications system for timely notification of a POL spill or hazardous substance spill.

C18.3.3.5.2. Public affairs involvement.

C18.3.3.6. A current roster of the persons, and alternates, who must receive notice of a POL or hazardous substance spill, including a Defense Logistics Agency (DLA) Energy representative if applicable. The roster will include name, organization mailing address, and work and home telephone numbers. Without compromising security, the plan will include provisions for the notification of the emergency coordinator after normal working hours.

C18.3.3.7. The plan will provide for notification of the FIC, installation commander, and local authorities in the event of hazard to human health or environment.

C18.3.3.8. Assignment of responsibilities for making the necessary notifications, including notification to the emergency services providers.

C18.3.3.9. Surveillance procedures for early detection of POL and hazardous substance spills.

C18.3.3.10. A prioritized list of various critical water and natural resources that will be protected in the event of a spill.

C18.3.3.11. 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 a spill exceeds the response capability of the installation.

C18.3.3.12. 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.

C18.3.3.13. Procedures for the proper reuse and disposal of recovered substances, decontamination wastes, contaminated POL, and absorbent materials, and procedures to be accomplished prior to resumption of operations.

C18.3.3.14. A description of general health, safety, and fire prevention precautions for spill cleanup actions.

C18.3.3.15. 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 spill 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 DoD LEC 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;

C18.3.4.3.2. The spill exceeds 400 liters (110 gallons) of POLs;

C18.3.4.3.3. A water resource has been polluted by the spill; 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 Italian drinking water resource, the appropriate in-theater component commander and/or Defense Agency, DoD LEC, and Italian Base Commander shall 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 subparagraph C18.3.4.4. and additionally will notify the local fire departments and obtain necessary assistance.

C18.3.4.6. In addition, when any spill occurs that results in soil or groundwater contamination exceeding or likely to exceed the concentrations listed in Table 18.1, measures implemented to contain the potential contamination and ensure an adequate level of protection for human health and environment shall be immediately reported to the Italian authorities.

C18.3.4.7. Within 48 hours after this initial notification of a spill, or as soon as possible, preliminary investigations shall be carried out to ascertain whether the concentrations listed in Table 18.1 have been exceeded.

C18.3.5. Training. Installations will provide necessary training and spill response drills to ensure the effectiveness of personnel and equipment.

C18.3.6. Further Actions. After completion of the initial response, any remaining free product and/or obviously contaminated soil will be appropriately removed and managed. Further actions will be governed by DoDI 4715.8, “Environmental Remediation for DoD Activities Overseas” and EUCOM Directive 80-2 “Environmental Executive Agent Remediation Policy.”

Table 18.1. Contamination Threshold Concentrations for Soil and Groundwater by Site Use

Parameter	Soil		Groundwater ²
	Recreation, Private, and Residential Use	Commercial and Industrial Use	
Units	(mg/kg)	(mg/kg)	(µ/L)
Metals			
Aluminum	NA	NA	200
Antimony	10	30	5
Arsenic	20	50	10
Beryllium	2	10	4
Cadmium	2	15	5
Chromium (Total)	150	800	50
Chromium VI	2	15	5
Cobalt	20	250	50
Copper	120	600	1,000
Iron	NA	NA	200
Lead	100	1,000	10
Manganese	NA	NA	50
Mercury	1	5	1
Nickel	120	500	20
Selenium	3	15	10
Silver	NA	NA	10
Thallium	1	10	2
Tin	1	350	NA
Vanadium	90	250	NA
Zinc	150	1,500	3,000
Inorganic Compounds			
Boron	NA	NA	1,000
Cyanides (Total)	1	100	50
Fluorides	100	2,000	100
Nitrites	NA	NA	500
Sulfates	NA	NA	250,000
Organic Aromatic Compounds			
A Benzene	0.1	2	1
B Ethylbenzene	0.5	50	50
C Styrene	0.5	50	25
D Toluene	0.5	50	15
E para-Xylene	0.5	50	10
Sum of Aromatic Compounds B-E	1	100	NA
Polycyclic Aromatic Compounds ⁽¹⁾			
F Benzo(a)anthracene	0.5	10	0.1
G Benzo(a)pyrene	0.1	10	0.01
H Benzo(b)fluoranthene	0.5	10	0.1
I Benzo(k)fluoranthene	0.5	10	0.05
J Benzo(g,h,i)perylene	0.1	10	0.01
K Chrysene	5	50	5
L Dibenzo(a, c)pyrene	0.1	10	NA
M Dibenzo(a, l)pyrene	0.1	10	NA
N Dibenzo(a, i)pyrene	0.1	10	NA
O Dibenzo(a, h)pyrene	0.1	10	NA
P Dibenzo(a,h)anthracene	0.1	10	0.01

Parameter	Soil		Groundwater ²
	Recreation, Private, and Residential Use	Commercial and Industrial Use	
Q Indeno(1,2,3-c,d)pyrene	0.1	5	0.1
R Pyrene	5	50	50
Sum of Polycyclic Aromatic Compounds F-O	10	100	NA
Sum of Polycyclic Aromatics Compounds H, I, J, and N	NA	NA	0.1
Carcinogenic Aliphatic Chlorinated Compounds⁽¹⁾			
Chloromethane	0.1	5	1.5
1,2-Dichloroethane	0.2	5	3
1,1-Dichloroethylene	0.1	1	0.05
1,1,1-Trichloroethane	0.5	50	NA
Dichloromethane	0.1	5	NA
Esachlorobutadiene	NA	NA	0.15
Tetrachloroethylene (PCE)	0.5	20	1.1
Trichloroethylene	1	10	1.5
Trichloromethane	0.1	5	0.15
Vinyl Chloride	0.01	0.1	0.5
Sum of Organohalogenated Compounds	NA	NA	10
Non-Carcinogenic Aliphatic Chlorinated Compounds			
1,1-Dichloroethane	0.5	30	810
1,2-Dichloroethylene	0.3	15	60
1,2-Dichloropropane	0.3	5	0.15
1,1,2-Trichloroethane	0.5	15	0.2
1,2,3-Trichloropropane	1	10	0.001
1,1,2,2-Tetrachloroethane	0.5	10	0.05
Carcinogenic Aliphatic Halogenated Compounds			
Bromodichloromethane	0.5	10	0.17
Bromoform	0.5	10	0.3
Dibromochloromethane	0.5	10	0.13
1,2-Dibromoethane	0.01	0.1	0.001
Nitrobenzene Compounds			
Chloronitrobenzenes (each)	0.1	10	0.5
1,2-Dinitrobenzene	0.1	25	15
1,3-Dinitrobenzene	0.1	25	3.7
Nitrobenzene	0.5	30	3.5
Chlorobenzene Compounds			
1,2-Dichlorobenzene	1	50	270
1,4-Dichlorobenzene	0.1	10	0.5
Esachlorobenzene	0.05	5	0.01
Monochlorobenzene	0.5	50	40
Pentachlorobenzene	0.1	50	5
1,2,4,5-Tetrachlorobenzene	1	25	1.8
1,2,4-Trichlorobenzene	1	50	190
Non-Chlorinated Phenols⁽¹⁾			
Methylphenol (o-,m-,p-)	0.1	25	NA
Phenol	1	60	NA
Phenols and Chlorinated Phenols			
2-Chlorophenol	0.5	25	180

Parameter	Soil		Groundwater ²
	Recreation, Private, and Residential Use	Commercial and Industrial Use	
2,4-Dichlorophenol	0.5	50	110
Pentachlorophenol	0.01	5	0.5
2,4,6-Trichlorophenol	0.01	5	5
Aromatic Amines			
Aniline	0.05	5	10
Diphenylamine	0.1	10	910
p-Toluidine	0.1	5	0.35
m-Anisidine	0.1	10	NA
p-Anisidine	0.1	10	NA
Sum of Aromatic Amines (73-77)	0.5	25	NA
Pesticides			
Alachlor	0.01	1	0.1
Aldrin	0.01	0.1	0.03
Atrazine	0.01	1	0.3
Chlordane	0.01	0.1	0.1
DDD, DDT, DDE	0.01	0.1	0.1
Dieldrin	0.01	0.1	0.03
Endrin	0.01	2	0.1
α -Lindane	0.01	0.1	0.1
β -Lindane	0.01	0.5	0.1
γ -Lindane	0.01	0.5	0.1
Sum of Pesticides	NA	NA	0.5
Dioxins and Furans			
PCBs	0.06	5	0.01
Sum of PCDD and PCDF (TEF conversion)	1×10^{-5}	1×10^{-4}	4×10^{-6}
Hydrocarbons			
C $\leq$ 12	10	250	NA
C $>$ 12	50	750	NA
Other Compounds			
Asbestos (Fibers A > 10 mm)	1,000*	1,000*	NA
Acrylamide	NA	NA	0.1
n-Hexane	NA	NA	350
para-Phthalic Acid	NA	NA	37,000
Phthalic Acid Ester (each)	10	60	NA

Notes:

- The table includes, for each chemical category, compounds that are frequently encountered at contaminated sites. For those compounds not specifically included in this table, the maximum concentration limits are derived by comparison with the compound more similar toxicologically.
 - In those cases when the regulations for the protection of water from pollution include different values than those reported in this table and specify a timeframe to achieve these concentrations, the values of this table are replaced by those in the regulations and the approval of remedial projects must take into consideration these values and the implementation of applicable deadlines.
- * Corresponding to the analytical method detection limit.

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C19. CHAPTER 19UNDERGROUND STORAGE TANKSC19.1. 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, “Hazardous Waste.” Criteria for aboveground and below ground POL storage containers are addressed in Chapter 9, “Petroleum, Oil, & Lubricants.”

C19.2. DEFINITIONS

C19.2.1. Deferred UST. A deferred UST is an underground tank system that fits into one of the following categories:

C19.2.1.1. A hydrant fuel distribution system; or

C19.2.1.2. A field-constructed tank.

C19.2.2. Hazardous Material. Any material defined as a hazardous material in Chapter 5, “Hazardous Material.” 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. Hazardous Material UST. A UST that contains a hazardous material (but not including hazardous wastes as defined in Chapter 6) or any mixture of such hazardous materials and petroleum, and which is not a petroleum UST.

C19.2.4. POL. Refined petroleum, oils, and lubricants.

C19.2.5. Tank Tightness Testing. A test which 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.

C19.2.6. Underground Storage Tank (UST). Any tank including underground piping connected thereto, larger than 416 liters (110 gallons), which is used to contain POL products or hazardous material and the volume of which, including the volume of connected pipes, is $\geq 10\%$ beneath the surface of the ground, but does not include:

C19.2.6.1. Tanks containing heating oil used for consumption on the premises where it is stored;

C19.2.6.2. Septic tanks;

C19.2.6.3. Stormwater or wastewater collection systems;

C19.2.6.4. Flow through process tanks;

C19.2.6.5. Surface impoundments, pits, ponds, or lagoons;

C19.2.6.6. Field constructed tanks;

C19.2.6.7. Hydrant fueling systems;

C19.2.6.8. 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;

C19.2.6.9. USTs containing *de minimis* concentrations of regulated substances, except where C19.3.2.8. is applicable; and

C19.2.6.10. Emergency spill or overflow containment UST systems that are expeditiously emptied after use.

C19.3. CRITERIA

C19.3.1. All installations will maintain a UST inventory.

C19.3.2. POL USTs. All petroleum UST systems will be properly installed, protected from corrosion, provided with spill/overflow prevention, and will incorporate leak detection as described below. POL USTs installed at fuel filling stations will either be double-walled or have a secondary containment vault.

C19.3.2.1. Corrosion Protection. USTs 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 a competent authority.

C19.3.2.1.1. Fuel Filling Stations. Double-walled USTs installed at fuel filling stations shall have walls constructed of one of the following:

C19.3.2.1.1.1. Both metallic, with the external surface coated with an anti-corrosion layer;

C19.3.2.1.1.2. Metallic internal surface and non-metallic external surface;

C19.3.2.1.1.3. Both non-metallic surface if the wall material is both resistant to corrosion and to mechanical stress; or

C19.3.2.1.1.4. Non-metallic internal surface and anti-corrosion-coated metallic external surface.

C19.3.2.1.1.5. Single-walled USTs are allowed at fuel filling stations if placed in a containment vault that has been coated with an impermeable material and equipped with continuous leak monitoring. The same vault may hold more than one UST without partitioning.

C19.3.2.2. Spill/Overflow Protection. USTs will be provided with spill and overfill prevention equipment, except where transfers are made in the amounts of ≤ 95 liters (25 gallons). Where spill and overfill protection are required, a spill containment box must be installed around the fill pipe. Overfill prevention will be provided by one of the following methods:

C19.3.2.2.1. Automatic shut-off device (set at 95% of tank capacity).

C19.3.2.2.2. High level alarm (set at 90% of tank capacity).

C19.3.2.3. Leak Detection. Leak detection systems must be capable of detecting a 0.38 liter/hour (0.1 gallon/hour) leak rate or a release of 568 liters (150 gallons) (or 1% of the tank volume, whichever is less) within 30 days with a probability of detection of 0.95 and a probability of false alarm of < 0.05 .

C19.3.2.3.1. 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 pressurized UST piping must be equipped with automatic line leak detectors and utilize either an annual tightness test or monthly monitoring. New UST piping shall also be equipped with a “sleeve” or equivalent system to collect leaks/spills.

C19.3.2.3.3. Suction piping will either have a line tightness test conducted every three years or use monthly monitoring.

C19.3.2.4. USTs and piping will be properly closed if not needed, or be upgraded or replaced.

C19.3.2.5. Any UST and piping not incorporating a functioning leak detection system will require immediate corrective action. Such systems will be tightness tested annually in accordance with recognized U.S. industry standards and inventoried monthly to determine system tightness.

C19.3.2.6. Liquefied Petroleum Gas (LPG) USTs. Integrity tests on LPG USTs shall be conducted every ten years using the acoustic emissions methodology by certified personnel.

C19.3.2.7. Any verified leaking UST or UST piping will be immediately removed from service. Any UST and piping suspected of leaking (e.g., leak detection equipment), will be verified for leakage to ensure there is not a false positive, or alternately, will immediately be 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. Notification of the Italian Base Commander (see Chapter 1 for the process) shall follow the criteria established in Chapter 18, "Spill Prevention & Response Planning." Additional action will be governed by DoDI 4715.8, "Environmental Remediation for DOD Activities Overseas," and EUCOM Directive 80-2, "Environmental Executive Agent Remediation Policy." 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.

C19.3.2.8. When a UST has not been used for one year, or is determined to no longer be required, all of the product and sludges must be removed. Subsequently, the UST must be either cleaned and filled with an inert substance, or removed. UST wastes must be handled in accordance with Chapter 9, "Petroleum, Oil, & Lubricants," paragraph C9.3.4.

C19.3.2.9. When the product stored in a UST is changed, the UST must be emptied and cleaned by removing all liquid and accumulated sludge.

C19.3.2.10. When a UST system is temporarily closed, corrosion protection and leak detection systems (if the UST is not empty) must be operated and maintained. If a UST system is temporarily closed for ≥ 3 months, the following must be complied with:

C19.3.2.10.1. Vent lines must be left open and functioning; and

C19.3.2.10.2. All other lines, pumps, manways, and ancillary equipment must be secured and capped.

C19.3.3. UST Recordkeeping. Installations will maintain a tank system inventory to include tank system installation, repair, removal, replacement, or upgrade, and operation of corrosion protection equipment for the life of the tank.

C19.3.4. Hazardous Material USTs

C19.3.4.1. All hazardous material USTs and piping must meet the same design and construction standards as required for 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.

C19.3.4.3. Hazardous material USTs and piping that do not incorporate the criteria contained in subparagraph C19.3.4.1 shall be immediately removed from service and upgraded or replaced as necessary.

C19.3.5. Deferred USTs. Deferred USTs constructed after 8 May 1985 must be designed and constructed with corrosion protection, non-corrodible materials, or be otherwise designed and constructed to prevent releases from corrosion or structural failure. UST materials must be compatible with the substance(s) to be stored.

C19.3.6. Identification Tags for USTS Installed at Fuel Filling Stations

C19.3.6.1. The maximum storage capacity of POL USTs installed at fuel filling stations is 50 m³ (1,765 ft³). POL USTs installed at fuel filling stations shall have an identification tag with the following information:

C19.3.6.1.1. Name and address of the UST manufacturer;

C19.3.6.1.2. Year of construction;

C19.3.6.1.3. Storage capacity, wall thickness, and construction material(s); and

C19.3.6.1.4. UST operating pressure and operating pressure of the interstitial space.

C19.3.7. Minimum Distance for USTS from Drinking Water Supply Wells. USTs for POL and/or hazardous materials shall be ≥ 200 meters (656 feet) from any drinking water supply well. Refer to Chapter 3, "Drinking Water."

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All notes appear at the end of the table.

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Acenaphthene	83329		100	
Acenaphthylene	208968		5,000	
Acetaldehyde (I)	75070		1,000	
Acetaldehyde, chloro-	107200		1,000	P
Acetaldehyde, trichloro-	75876		5,000	P
Acetamide	60355		100	
Acetamide, N-(aminothioxomethyl)-	591082		1,000	
Acetamide, N-(4-ethoxyphenyl)-	62442		100	
Acetamide, 2-fluoro-	640197		100	P
Acetamide, N-9H-fluoren-2-yl-	53963		1	
Acetic acid	64197		5,000	
Acetic acid (2,4-dichlorophenoxy)-salts and esters	94757		100	
Acetic acid, lead(2+) salt	301042		10	
Acetic acid, thallium(1+) salt	563688		1000	
Acetic acid, (2,4,5-trichlorophenoxy)	93765		1,000	
Acetic acid, ethyl ester (I)	141786		5,000	
Acetic acid, fluoro-, sodium salt	62748		10	P
Acetic anhydride	108247		5,000	
Acetone (I)	67641		5,000	
Acetone cyanohydrin	75865	1,000	10	P
Acetone thiosemicarbazide	1752303	1,000/10,000	1	
Acetonitrile (I,T)	75058		5,000	
Acetophenone	98862		5,000	
2-Acetylaminofluorene	53963		1	
Acetyl bromide	506967		5,000	
Acetyl chloride (C,R,T)	75365		5,000	
1-Acetyl-2-thiourea	591082		1	P
Acrolein	107028	500	1	P
Acrylamide	79061	1,000/10,000	5,000	
Acrylic acid (I)	79107		5,000	
Acrylonitrile	107131	10,000	100	
Acrylyl chloride	814686	100	1	
Adipic acid	124049		5,000	
Adiponitrile	111693	1,000	1	
Aldicarb	116063	100/10,000	1	P
Aldrin	309002	500/10,000	1	P
Allyl alcohol	107186	1,000	100	P
Allylamine	107119	500	1	
Allyl chloride	107051		1,000	
Aluminum phosphide (R,T)	20859738	500	100	P
Aluminum sulfate	10043013		5,000	
4-Aminobiphenyl	92671		1	
5-(Aminomethyl)-3-isoxazolol	2763964		1,000	P
Aminopterin	54626	500/10,000	1	
4-Aminopyridine	504245		1,000	P

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Amiton	78535	500	1	
Amiton oxalate	3734972	100/10,000	1	
Amitrole	61825		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		10	P
Ammonium silicofluoride	16919190		1,000	
Ammonium sulfamate	7773060		5,000	
Ammonium sulfide	12135761		100	
Ammonium sulfite	10196040		5,000	
Ammonium tartrate	14307438 3164292		5,000	
Ammonium thiocyanate	1762954		5,000	
Ammonium vanadate	7803556		1,000	P
Amphetamlne	300629	1,000	1	
Amyl acetate: Iso-Amyl acetate Sec-Amyl acetate Tert-Amyl acetate	628637 123922 626380 625161		5,000	
Aniline (I,T)	62533	1,000	5,000	
Aniline, 2,4,6- trimethyl	88051	500	1	
o-Anisidine	90040		100	
Anthracene	120127		5,000	
Antimony ⁴	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	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Argentate(1-), bis(cyano-C)-, potassium	506616		1	P
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 ⁴	7440382		1	
Arsenic acid H ₃ AsO ₄	1327522 7778394		1	P
Arsenic disulfide	1303328		1	
Arsenic oxide As ₂ O ₃	1327533		1	P
Arsenic oxide As ₂ O ₅	1303282		1	P
Arsenic pentoxide	1303282	100/10,000	1	P
Arsenic trichloride	7784341		1	
Arsenic trioxide	1327533		1	P
Arsenic trisulfide	1303339		1	
Arsenous oxide	1327533	100/10,000	1	P
Arsenous trichloride	7784341	500	5,000	
Arsine	7784421	100	1	
Arsine, diethyl-	692422		1	P
Arsinic acid, dimethyl-	75605		1	
Arsorous dichloride, phenyl-	696286		1	P
Asbestos ⁵	1332214		1	
Auramine	492808		100	
Azaserine	115026		1	
Aziridine	151564		1	P
Azindine, 2-methyl-	75558		1	P
Azirino[2',3',3,4]pyrrolo[1,2-a]indole-4, 7-dione,6-amino-8-[[aminocarbonyloxy)methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl-, [1aS-(1a-alpha, 8-beta, 8a-alpha, 8b-alpha)]-	50077		10	
Azinphos-ethyl	2642719	100/10,000	100	
Azinphos-methyl	86500	10/10,000	1	
Barium cyanide	542621		10	P
Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	56495		10	
Benz[c]acridine	225514		100	
Benzal chloride	98873	500	5,000	
Benzamide, 3,5-dichloro-N-(1,1-dimethyl-2-propynyl)-	23950585		5,000	
Benz[a]anthracene	56553		10	
1,2-Benzanthracene	56553		10	
Benz[a]anthracene, 7,12-dimethyl-	57976		1	
Benzenamine (I,T)	62533		5,000	
Benzenamine, 3-(Trifluoromethyl)	98168	500	1	
Benzenamine, 4,4'-carbonimidoylbis (N,N-	492808		100	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
dimethyl-				
Benzenamine, 4-chloro-	106478		1,000	P
Benzenamine, 4-chloro-2-methyl-, hydrochloride	3165933		100	
Benzenamine, N,N-dimethyl-4-(phenylazo-)	60117		10	
Benzenamine, 2-methyl-	95534		100	
Benzenamine, 4-methyl-	106490		100	
Benzenamine, 4,4'-methylenebis(2-chloro-	101144		10	
Benzenamine, 2-methyl-, hydrochloride	636215		100	
Benzenamine, 2-methyl-5-nitro-	99558		100	
Benzenamine, 4-nitro-	100016		5,000	P
Benzene (I,T)	71432		10	
Benzene, 1-(Chloromethyl)-4-Nitro-	100141	500/10,000	1	
Benzenecetic acid, 4-chloro-alpha- (4-chlorophenyl)-alpha-hydroxy-, ethyl ester	510156		10	
Benzene, 1-bromo-4-phenoxy-	101553		100	
Benzenearsonic Acid	98055	10/10,000	1	
Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	305033		10	
Benzene, chloro-	108907		100	
Benzene, chloromethyl-	100447		100	P
Benzenediamin, ar-methyl-	25376458 95807 496720 823405		10	
1,2-Benzenedicarboxylic acid, dioctyl ester	117840		5,000	
1,2-Benzenedicarboxylic acid, [bis(2-ethylhexyl)]-ester	117817		100	
1,2-Benzenedicarboxylic acid, dibutyl ester	84742		10	
1,2-Benzenedicarboxylic acid, diethyl ester	84662		1,000	
1,2-Benzenedicarboxylic acid, dimethyl ester	131113		5,000	
Benzene, 1,2-dichloro-	95501		100	
Benzene, 1,3-dichloro-	541731		100	
Benzene, 1,4-dichloro-	106467		100	
Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	72548		1	
Benzene, dichloromethyl-	98873		5,000	
Benzene, 1,3-diisocyanotomethyl- (R,T)	584849 91087 264716254		100	
Benzene, dimethyl (I,T)	1330207		100	
m-Benzene, dimethyl	108383		1,000	
o-Benzene, dimethyl	95476		1,000	
p-Benzene, dimethyl	106423		100	
1,3-Benzenediol	108463		5,000	
1,2-Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]- (R) -	51434		1,000	P
Benzenethanamine, alpha, alpha-dimethyl-	122098		5,000	P
Benzene, hexachloro-	118741		10	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Benzene, hexahydro- (I)	110827		1,000	
Benzene, hydroxy-	108952		1,000	
Benzene, methyl-	108883		1,000	
Benzene, 2-methyl-1,3-dinitro-	606202		100	
Benzene, 1-methyl-2,4-dinitro-	121142		10	
Benzene, 1-methylethyl- (I)	98828		5,000	
Benzene, nitro-	98953		1,000	
Benzene, pentachloro-	608935		10	
Benzene, pentachloronitro-	82688		100	
Benzenesulfonic acid chloride (C,R)	98099		100	
Benzenesulfonyl chloride	98099		100	
Benzene, 1,2,4,5-tetrachloro-	95943		5,000	
Benzenethiol	108985		100	P
Benzene, 1,1'-(2,2,2-tri-chloroethylidene)bis[4-chloro-	50293		1	
Benzene, 1,1'-(2,2,2-trichloroethylidene) bis[4-methoxy-	72435		1	
Benzene, (trichloromethyl)-	98077		10	
Benzene, 1,3,5-trinitro-	99354		10	
Benzidine	92875		1	
Benzimidazole, 4,5-Dichloro-2-(Trifluoromethyl)-	3615212	500/10,000	1	
1,2-Benzisothiazol-3(2H)-one, 1,1-dioxide	81072		100	
Benzo[a]anthracene	56553		10	
Benzo[b]fluoranthene	205992		1	
Benzo[k]fluoranthene	207089		5,000	
Benzo[j,k]fluorene	206440		100	
1,3-Benzodioxole, 5-(1-propenyl)-	120581		100	
1,3-Benzodioxole, 5-(2-propenyl)-	94597		100	
1,3-Benzodioxole, 5-propyl-	94586		10	
Benzoic acid	65850		5,000	
Benzonitrile	100470		5,000	
Benzo[rs]pentaphene	189559		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		100	P
Benzo[a]pyrene	50328		1	
3,4-Benzopyrene	50328		1	
p-Benzoquinone	106514		10	
Benzotrichloride (C,R,T)	98077	500	10	
Benzoyl chloride	98884		1,000	
1,2-Benzphenanthrene	218019		100	
Benzyl chloride	100447	500	100	P
Benzyl cyanide	140294	500	1	
Beryllium ⁴	7440417		10	P
Beryllium chloride	7787475		1	
Beryllium fluoride	7787497		1	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Beryllium nitrate	13597994 7787555		1	
alpha-BHC	319846		10	
beta-BHC	319857		1	
delta-BHC	319868		1	
gamma-BHC	58899		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		10	
Biphenyl	92524		100	
(1,1'-Biphenyl)-4,4'diamine	92875		1	
(1,1'-Biphenyl)-4,4'diamine, 3,3'dichloro-	91941		1	
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethoxy-	119904		10	
(1,1'-Biphenyl)-4,4'diamine, 3,3'dimethyl-	119937		10	
Bis(chloromethyl) ketone	534076	10/10,000	1	
Bis(2-chloroethyl)ether	111444		10	
Bis(2-chloroethoxy)methane	111911		1,000	
Bis(2-ethylhexyl)phthalate	117817		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		1,000	P
Bromadiolone	28772567	100/10,000	1	
Bromine	7726956	500	1	
Bromoform	75252		100	
4-Bromophenyl phenyl ether	101553		100	
Brucine	357573		100	P
1,3-Butadiene	106990		10	
1,3-Butadiene, 1,1,2,3,4,4-hexachloro-	87683		1	
1-Butanamine, N-butyl-N-nitroso-	924163		10	
1-Butanol	71363		5,000	
2-Butanone	78933		5,000	
2-Butanone peroxide (R,T)	1338234		10	
2-Butanone, 3,3-dimethyl-1-(methylthio)-, O[(methylamino)carbonyl] oxime	39196184		100	P
2-Butenal	123739 4170303		100	
2-Butene, 1,4-dichloro- (I,T)	764410		1	
2-Butenoic acid, 2-methyl-, 7[[2,3-dihydroxy-2-(1-methoxyethyl)-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		10	

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Butyl acetate:	123864		5,000	
iso-Butyl acetate	110190			
sec-Butyl acetate	105464			
tert-Butyl acetate	540885			
n-Butyl alcohol (I)	71363		5,000	
Butylamine:	109739		1,000	
iso-Butylamine	78819			
sec-Butylamine	513495			
tert-Butylamine	13952846			
	75649			
Butyl benzyl phthalate	85687		100	
n-Butyl phthalate	84742		10	
Butyric acid	107926		5,000	
iso-Butyric acid	79312			
Cacodylic acid	75605		1	
Cadmium (2+) ⁴	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		10	
Calcium cyanamide	156627		1,000	
Calcium cyanide Ca(CN) ₂	592018		10	P
Calcium dodecylbenzenesulfonate	26264062		1,000	
Calcium hypochlorite	7778543		10	
Camphchlor	8001352	500/10,000	1	
Camphene, octachloro-	8001352		1	P
Cantharidin	56257	100/10,000	1	
Carbachol chloride	51832	500/10,000	1	
Captan	133062		10	
Carbamic acid, ethyl ester	51796		100	
Carbamic acid, methylnitroso-, ethyl ester	615532		1	
Carbamic acid, Methyl-, 0-(((2,4-Dimethyl-1, 3-Dithiolan-2-yl)Methyllene)Amino)-	26419738	100/10,000	1	
Carbamic chloride, dimethyl-	79447		1	
Carbamodithioic acid, 1,2-ethaneiyibis, salts & esters	111546		5,000	
Carbamothioic acid, bis(1-methylethyl)-, S-(2,3-dichloro-2-propenyl) ester	2303164		100	
Carbaryl	63252		100	
Carbofuran	1563662	10/10,000	10	
Carbon disulfide	75150	10,000	100	P
Carbon oxyfluoride (R,T)	353504		1,000	
Carbon tetrachloride	56235		10	
Carbonic acid, dithallium(1+) salt	6533739		100	

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Carbonic dichloride	75445		10	P
Carbonic difluoride	353504		1,000	
Carbonochloridic acid, methyl ester	79221		1,000	
Carbonyl Sulfide	463581		100	
Carbophenothion	786196	500	1	
Catechol	120809		100	
Chloral	75876		5,000	
Chlorambem	133904		100	
Chlorambucil	305033		10	
Chlordane	57749	1,000	1	
Chlordane, alpha & gamma isomers	57749		1	
Chlordane, technical	57749		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		100	
Choroacetaldehyde	107200		1,000	P
Chloroacetophenone	532274		100	
Chloroacetic acid	79118	100/10,000	100	
p-Chloroaniline	106478		1,000	P
Chlorobenzene	108907		100	
Chlorobenzilate	510156		10	
p-Chloro-m-cresol (4)	59507		5,000	
1-Chloro-2,3-epoxypropane	106898		100	
Chlorodibromomethane	124481		100	
Chloroethane	75003		100	
Chloroethanol	107073	500	1	
Chloroethyl chlorofomate	627112	1,000	1	
2-Chloroethyl vinyl ether	110758		1,000	
Chloroform	67663	10,000	10	
Chloromethane	74873		100	
Chloromethyl ether	542881	100	1	P
Chloromethyl methyl ether	107302	100	1	
beta-Chloronaphthalene	91587		5,000	
2-Chloronaphthalene	91587		5,000	
Chlorophacinone	3691358	100/10,000	1	
o-Chlorophenol (2)	95578		100	
4-Chlorophenyl phenyl ether	7005723		5,000	
1-(o-Chlorophenyl)thiourea	5344821		100	P
Chloroprene	126998		100	
3-Chloropropionitrile	542767		1,000	P
Chlorosulfonic acid	7790945		1,000	
4-Chloro-o-toluidine, hydrochloride	3165933		100	
Chlorpyrifos	2921882		1	
Chloroxuron	1982474	500/10,000	1	
Chlorthiophos	21923239	500	1	

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Chromic acetate	1066304		1,000	
Chromic acid	11115745 7738945		10	
Chromic acid H ₂ CrO ₄ , calcium salt	13765190		10	
Chromic chloride (Chromium chloride)	10025737	1/10,000	1	
Chromic sulfate	10101538		1,000	
Chromium ⁴	7440473		5,000	
Chromous chloride	10049055		1,000	
Chrysene	218019		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	
Colchicine	64868	10/10,000	1	
Copper ⁴	7440508		5,000	
Copper cyanide	544923		10	P
Coumaphos	56724	100/10,000	10	
Coumatetralyl	5836293	500/10,000	1	
Creosote	8001589		1	
Cresol(s) (Phenol, Methyl):	1319773		100	
m-Cresol	108394	1,000/10,000	100	
o-Cresol	95487		100	
p-Cresol	106445		100	
Cresylic acid:	1319773		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	100 100	
Cumene (I)	98828		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 sulfate, ammoniated	10380297		100	
Cupric tartrate	815827		100	
Cyanides (soluble salts and complexes) not otherwise specified	57125		10	P
Cyanogen	460195		100	P
Cyanogen bromide	506683	500/10,000	1,000	
Cyanogen chloride	506774		10	P
Cyanogen iodide (Iodine cyanide)	506785	1,000/10,000	1	

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Cyanophos	2636262	1,000	1	
Cyanuric fluoride	675149	100	1	
2,5-Cyclohexadiene-1,4-dione	106514		10	
Cyclohexane (I)	110827		1,000	
Cyclohexane, 1,2,3,4,5,6-hexachloro, (1-alpha, 2-alpha, 3-beta, 4-alpha, 5-alpha, 6-beta)-	58899		1	
Cyclohexanone (I)	108941		5,000	
2-Cyclohexanone	131895		100	P
Cycloheximide	66819	100/10,000	1	
Cyclohexylamine	108918	10,000	1	
1,3-Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	77474		10	
Cyclophosphamide	50180		10	
2,4-D Acid	94757		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		100	
Daunomycin	20830813		10	
Decarborane(14)	17702419	500/10,000	1	
Demeton	8065483	500	1	
Demeton-S-Methyl	919868	500	1	
DDD, 4,4'DDD	72548		1	
DDE, 4,4'DDE	72559		1	
DDT, 4,4'DDT	50293		1	
DEHP (Diethylhexyl phthalate)	117817		100	
Diallate	2303164		100	
Dialifor	10311849	100/10,000	1	
Diazinon	333415		1	
Diazomethane	334883		100	
Dibenz[a,h]anthracene	53703		1	
1,2:5,6-Dibenzanthracene	53703		1	
Dibenzo[a,h]anthracene	53703		1	
Dibenzofuran	132649		100	
Dibenz[a,i]pyrene	189559		10	
1,2-Dibromo-3-chloropropane	96128		1	
Dibromoethane	106934		1	
Diborane	19287457	100	1	
Dibutyl phthalate	84742		10	
Di-n-butyl phthalate	84742		10	
Dicamba	1918009		1,000	
Dichlobenil	1194656		100	

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Dichlone	117806		1	
Dichlorobenzene	25321226		100	
m-Dichlorobenzene (1,3)	541731		100	
o-Dichlorobenzene (1,2)	95501		100	
p-Dichlorobenzene (1,4)	106467		100	
3,3'-Dichlorobenzidine	91941		1	
Dichlorobromomethane	75274		5,000	
1,4-Dichloro-2-butene (I,T)	764410		1	
Dichlorodifluoromethane	75718		5,000	
1,1-Dichloroethane	75343		1,000	
1,2-Dichloroethane	107062		100	
1,1-Dichloroethylene	75354		100	
1,2-Dichloroethylene	156605		1,000	
Dichloroethyl ether	11444	10,000	10	
Dichloroisopropyl ether	108601		1,000	
Dichloromethoxy ethane	111911		1,000	
Dichloromethyl ether	542881		1	P
Dichloromethylphenylsilane	149746	1,000	1	
2,4-Dichlorophenol	120832		100	
2,6-Dichlorophenol	87650		100	
Dichlorophenylarsine	696286		1	P
Dichloropropane	26638197		1,000	
1,1-Dichloropropane	78999			
1,3-Dichloropropane	142289			
1,2-Dichloropropane	78875		1,000	
Dichloropropane--Dichloropropene (mixture)	8003198		100	
Dichloropropene	26952238		100	
2,3-Dichloropropene	78886			
1,3-Dichloropropene	542756		100	
2,2-Dichloropropionic acid	75990		5,000	
Dichlorvos	62737	1,000	10	
Dicofol	115322		10	
Dicrotophos	141662	100	1	
Dieldrin	60571		1	P
1,2:3,4-Diepoxybutane (I,T)	1464535	500	10	
Diethanolamine	111422		100	
Diethyl chlorophosphate	814493	500	1	
Diethylamine	109897		1,000	
Diethylarsine	692422		1	P
Diethylcarbamazine citrate	1642542	100/10,000	1	
1,4-Diethylenedioxiide	123911		100	
Diethylhexyl phthalate	117817		100	
N,N-Diethylaniline	91667		1,000	
N,N'-Diethylhydrazine	1615801		10	
O,O-Diethyl S-methyl dithiophosphate	3288582		5,000	
Diethyl-p-nitrophenyl phosphate	311455		100	P
Diethyl phthalate	84662		1,000	
O,O-Diethyl O-pyrazinyl phosphorothioate	297972		100	P

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Diethylstilbestrol	56531		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		10	
Diisopropylfluorophosphate	55914		100	P
Diisopropylfluorophosphate, 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, 5-alpha, 8-alpha, 8a-beta)-	309002		1	P
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		1	P
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		1	P
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-beta, 3-alpha, 6-alpha, 6a-beta, 7-beta, 7a-alpha)-	72208		1	P
Dimethoate	60515		10	P
3,3'-Dimethoxybenzidine	119904		10	
Dimefox	115264	500	1	
Dimethoate	60515	500/10,000	10	
Dimethyl Phosphorochloridithioate	2524030	500	1	
Dimethyl sulfate	77781	500	100	
Dimethylamine (I)	124403		1,000	
p-Dimethylaminoazobenzene	60117		10	
7,12-Dimethylbenz[a]anthracene	57976		1	
3,3'-Dimethylbenzidine	119937		10	
alpha, alpha-Dimethylbenzylhydroperoxide(R)	80159		10	
Dimethylcarbamoyl chloride	79447		1	
Dimethylformamide	68122		100	
Dimethyldichlorosilane	75785	500	1	
1,1-Dimethylhydrazine	57147	1,000	10	
1,2-Dimethylhydrazine	540738		1	
alpha, alpha-Dimethylphenethylamine	122098		5,000	P
Dimethyl-p-phenylenediamine	99989	10/10,000	1	
2,4-Dimethylphenol	105679		100	
Dimethyl phthalate	131113		5,000	
Dimethyl sulfate	77781		100	
Dimetilan	644644	500/10,000	1	
Dinitrobenzene (mixed): m-Dinitrobenzene o-Dinitrobenzene p-Dinitrobenzene	25154545 99650 528290 100254		100	
4,6-Dinitro-o-cresol and salts	534521	10/10,000	10	P

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Dinitrophenol:	25550587		10	
2,5-Dinitrophenol	329715			
2,6-Dinitrophenol	573568			
2,4-Dinitrophenol	51285		10	P
Dinitrotoluene	25321146		10	
3,4-Dinitrotoluene	610399			
2,4-Dinitrotoluene	121142		10	
2,6-Dinitrotoluene	606202		100	
Dinoseb	88857	100/10,000	1,000	P
Dinoterb	1420071	500/10,000	1	
Di-n-octyl phthalate	117840		5,000	
1,4-Dioxane	123911		100	
Dioxathion	78342	500	1	
Diphacinone	82666	10/10,000	1	
1,2-Diphenylhydrazine	122667		10	
Diphosphoramidate, octamethyl-	152169	100	100	P
Diphosphoric acid, tetraethyl ester	107493		10	P
Dipropylamine	142847		5,000	
Di-n-propylnitrosamine	621647		10	
Diquat	85007 2764729		1,000	
Disulfoton	298044	500	1	P
Dithiazanine iodide	514738	500/10,000	1	
Dithiobiuret	541537	100/10,000	100	P
Diuron	330541		100	
Dodecylbenzenesulfonic acid	27176870		1,000	
Emetine, Dihydrochloride	316427	1/10,000	1	
Endosulfan	115297	10/10,000	1	P
alpha-Endosulfan	959988		1	
beta-Endosulfan	33213659		1	
Endosulfant sulfate	1031078		1	
Endothall	145733		1,000	P
Endothion	2778043	500/10,000	1	
Endrin	72208	500/10,000	1	P
Endrin aldehyde	7421934		1	
Endrin & metabolites	72208		1	P
Epichlorohydrin	106898	1,000	100	
Epinephrine	51434		1,000	P
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		1,000	
Ethanamine, N-ethyl-N-nitroso-	55185		1	
1,2-Ethanediamine, N,N-dimethyl-N'-2-pyridinyl-N'-(2-thienylmethyl)-	91805		5,000	
Ethane, 1,2-dibromo-	106934		1	
Ethane, 1,1-dichloro-	75343		1,000	
Ethane, 1,2-dichloro-	107062		100	

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Ethanedinitrile	460195		100	P
Ethane, hexachloro-	67721		100	
Ethane, 1,1'-[methylenebis(oxy)]bis(2-chloro-	111911		1,000	
Ethane, 1,1'-oxybis-	60297		100	
Ethane, 1,1'-oxybis(2-chloro-	111444		10	
Ethane, pentachloro-	76017		10	
Ethanesulfonyl chloride, 2-chloro	1622328	500	1	
Ethane, 1,1,1,2-tetrachloro-	630206		100	
Ethane, 1,1,2,2-tetrachloro-	79345		100	
Ethanethioamide	62555		10	
Ethane, 1,1,1-trichloro-	71556		1,000	
Ethane, 1,1,2-trichloro-	79005		100	
Ethanimidothioic acid, N-[[[(methylamino) carbonyl]oxy]-, methyl ester	16752775		100	P
Ethanol, 1,2-Dichloro-, acetate	10140871	1,000	1	
Ethanol, 2-ethoxy-	110805		1,000	
Ethanol, 2,2'-(nitrosoimino)bis-	1116547		1	
Ethanone, 1-phenyl-	98862		5,000	
Ethene, chloro-	75014		1	
Ethene, 2-chloroethoxy-	110758		1,000	
Ethene, 1,1-dichloro-	75354		100	
Ethene, 1,2-dichloro- (E)	156605		1,000	
Ethene, tetrachloro-	127184		100	
Ethene, trichloro-	79016		100	
Ethion	563122	1,000	10	
Ethoprophos	13194484	1,000	1	
Ethyl acetate (I)	141786		5,000	
Ethyl acrylate (I)	140885		1,000	
Ethylbenzene	100414		1,000	
Ethylbis(2-Chloroethyl)amine	538078	500	1	
Ethyl carbamate (urethane)	51796		100	
Ethyl chloride	75003		100	
Ethyl cyanide	107120		10	P
Ethylenebisdithiocarbamic acid, salts & esters	111546		5,000	
Ethylenediamine	107153		5,000	
Ethylenediamine-tetraacetic acid (EDTA)	60004		5,000	
Ethylene dibromide	106934		1	
Ethylene dichloride	107062		100	
Ethylene fluorohydrin	371620	10	1	
Ethylene glycol	107211		5,000	
Ethylene glycol monoethyl ether	110805		1,000	
Ethylene oxide (I,T)	75218	1,000	10	
Ethylenediamine	107153	10,000	5,000	
Ethylenethiourea	96457		10	
Ethyleneimine	151564	500	1	P
Ethyl ether (I)	60297		100	
Ethylthiocyanate	542905	10,000	1	
Ethylidene dichloride	75343		1,000	

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Ethyl methacrylate	97632		1,000	
Ethyl methanesulfonate	62500		1	
Famphur	52857		1,000	P
Fenamphos	22224926	10/10,000	1	
Fenitrothion	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	
Ferrous ammonium sulfate	10045893		1,000	
Ferrous chloride	7758943		100	
Ferrous sulfate	7720787 7782630		1,000	
Fluonetil	4301502	100/10,000	1	
Fluoranthene	206440		100	
Fluorene	86737		5,000	
Fluorine	7782414	500	10	P
Fluoroacetamide	640197	100/10,000	100	P
Fluoroacetic acid	144490	10/10,000	1	
Fluoroacetic acid, sodium salt	62786		10	P
Fluoroacetyl chloride	359068	10	1	
Fluorouracil	51218	500/10,000	1	
Fonofos	944229	500	1	
Formaldehyde	50000	500	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		5,000	
Fosthletan	21548323	500	1	
Fubendazole	3878191	100/10,000	1	
Fulminic acid, mercury(2 ⁺) salt (R,T)	628864		10	P
Fumaric acid	110178		5,000	
Furan (I)	110009	500	100	
Furan, tetrahydro- (I)	109999		1,000	
2-Furancarboxaldehyde (I)	98011		5,000	
2,5-Furandione	108316		5,000	
Furfural (I)	98011		5,000	
Furfuran (I)	110009		100	
Gallium trichloride	13450903	500/10,000	1	
Glucopyranose, 2-deoxy-2-(3-methyl-3-nitroso-ureido)-	18883664		1	
D-Glucose, 2-deoxy-2-[[[(methylnitrosoamino)-carbonyl]amino]-	18883664		1	
Glycidylaldehyde	765344		10	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Glycol ethers ⁶				**
Guanidine, N-methyl-N'-nitro-N-nitroso-	70257		10	
Guthion	86500		1	
Heptachlor	76448		1	P
Heptachlor epoxide	1024573		1	
Hexachlorobenzene	118741		10	
Hexachlorobutadiene	87683		1	
Hexachlorocyclohexane (gamma isomer)	58899		1	
Hexachlorocyclopentadiene	77474	100	10	
Hexachloroethane	67721		100	
Hexachlorophene	70304		100	
Hexachloropropene	1888717		1,000	
Hexaethyl tetraphosphate	757584		100	P
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		5,000	
Hydrazine (R,T)	302012	1,000	1	
Hydrazine, 1,2-diethyl-	1615801		10	
Hydrazine, 1,1-dimethyl-	57147		10	
Hydrazine, 1,2-dimethyl-	540738		1	
Hydrazine, 1,2-diphenyl-	122667		10	
Hydrazine, methyl-	60344		10	P
Hydrazinecarbothioamide	79196		100	P
Hydrochloric acid	7647010		5,000	
Hydrocyanic acid	74908	100	10	P
Hydrofluoric acid	7664393		100	
Hydrogen chloride (gas only)	7647010	500	5,000	
Hydrogen cyanide	74908		10	P
Hydrogen fluoride	7664393	100	100	
Hydrogen peroxide (Conc. >52%)	7722841	1,000	1	
Hydrogen phosphide	7803512		100	P
Hydrogen selenide	7783075	10	1	
Hydrogen sulfide	7783064	500	100	
Hydroperoxide, 1-methyl-1-phenylethyl-	80159		10	
Hydroquinone	123319	500/10,000	100	
2-Imidazolidinethione	96457		10	
Indeno(1,2,3-cd)pyrene	193395		100	
Iodomethane	74884		100	
Iron, Pentacarbonyl-	13463406	100	1	
Isobenzan	297789	100/10,000	1	
1,3-Isobenzofurandione	85449		5,000	
Isobutyronitrile	78820	1,000	1	
Isobutyl alcohol (I,T)	78831		5,000	
Isocyanic acid, 3,4-Dichlorophenyl ester	102363	500/10,000	1	
Isodrin	465736	100/10,000	1	P
Isofluorphate	55914	100	100	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Isophorone	78591		5,000	
Isophorone Diisocyanate	4098719	100	1	
Isoprene	78795		100	
Isopropanolamine dodecylbenzene sulfonate	42504461		1,000	
Isopropyl chloroformate	108236	1,000	1	
Isopropylmethylpyrazolyl dimethylcarbamate	119380	500	1	
Isosafrole	120581		100	
3(2H)-Isoxazolone, 5-(aminomethyl)-	2763964		1,000	P
Kepone	143500		1	
Lactonitrile	78977	1,000	1	
Lasiocarpine	303344		10	
Lead acetate	301042			
Lead arsenate	7784409 7645252 10102484		1	
Lead, bis(acetato-O)tetrahydroxytri	1335326		10	
Lead chloride	7758954		10	
Lead fluoborate	13814965		10	
Lead fluoride	7783462		10	
Lead iodide	10101630		10	
Lead nitrate	10099748		10	
Lead phosphate	7446277		10	
Lead stearate	7428480 1072351 52652592 56189094		10	
Lead subacetate	1335326		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	1	
Lithium chromate	14307358		10	
Lithium hydride	7580678	100	1	
Malathion	121755		100	
Maleic acid	110167		5,000	
Maleic anhydride	108316		5,000	
Maleic hydrazide	123331		5,000	
Malononitrile	109773	500/10,000	1,000	
Manganese, tricarbonyl methylcyclopentadienyl	12108133	100	1	
MDI (Methylene diphenyl diisocyanate)	101688		5,000	
Mechlorethamine	51752	10	1	
MEK (Methyl ethyl ketone)	78933		5,000	
Melphalan	148823		1	
Mephosfolan	950107	500	1	
Mercaptodimethur	2032657		10	
Mercuric acetate	1600277	500/10,000	1	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
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	
Mercury	7439976		1	
Mercury (acetate-O)phenyl-	62384		100	P
Mercury fulminate	628864		10	P
Methacrolein diacetate	10476956	1,000	1	
Methacrylic anhydride	760930	500	1	
Methacrylonitrile (I,T)	126987	500	1,000	
Methacryloyl chloride	920467	100	1	
Methacryloyloxyethyl isocyanate	30674807	100	1	
Methamidophos	10265926	100/10,000	1	
Methanamine, N-methyl-	124403		1,000	
Methanamine, N-methyl-N-nitroso-	62759		10	P
Methane, bromo-	74839		1,000	
Methane, chloro- (I,T)	74873		100	
Methane, chloromethoxy-	107302		1	
Methane, dibromo-	74953		1,000	
Methane, dichloro-	75092		1,000	
Methane, dichlorodifluoro-	75718		5,000	
Methane, iodo-	74884		100	
Methane, isocyanato-	624839		10	P
Methane, oxybis(chloro-	542881		1	P
Methanesulfenyl chloride, trichloro-	594423		100	P
Methanesulfonyl fluoride	558258	1,000	1	
Methanesulfonic acid, ethyl ester	62500		1	
Methane, tetrachloro-	56235		10	
Methane, tetranitro- (R)	509148		10	P
Methane, tribromo-	75252		100	
Methane, trichloro-	67663		10	
Methane, trichlorofluoro-	75694		5,000	
Methanethiol (I,T)	74931		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		1	P
1,3,4-Metheno-2H-cyclobutal[cd]pentalen-2- one, 1,1a,3,3a,4,5,5a,5b,6-decachlorooctahydro-	143500		1	
4,7-Methano-1H-indene, 1,4,5,6,7,8,8 heptachloro-3a,4,7,7a-tetrahydro-	76448		1	P
4,7-Methano-1H-indene, 1,2,4,5,6,7,8,8 octachloro-2,3,3a,4,7,7a-hexahydro-	57749		1	
Methanol (I)	67561		5,000	
Methapyrilene	91805		5,000	
Methidathion	950378	500/10,000	1	

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Methiocarb	2032657	500/10,000	10	P
Methomyl	16752775	500/10,000	100	P
Methoxychlor	72435		1	
Methoxyethylmercuric acetate	151382	500/10,000	1	
Methyl alcohol (I)	67561		5,000	
Methyl aziridine	75558		1	P
Methyl bromide	74839	1,000	1,000	
1-Methylbutadiene (I)	504609		100	
Methyl chloride (I,T)	74873		100	
Methyl 2-chloroacrylate	80637	500	1	
Methyl chlorocarbonate (I,T)	79221		1,000	
Methyl chloroform	71556		1,000	
Methyl chloroformate	79221	500	1,000	
3-Methylcholanthrene	56495		10	
4,4'-Methylenebis(2-chloroaniline)	101144		10	
Methylene bromide	74953		1,000	
Methylene chloride	75092		1,000	
4,4'-Methylenedianiline	101779		10	
Methylene diphenyl diisocyanate (MDI)	101688		5,000	
Methyl ethyl ketone (MEK) (I,T)	78933		5,000	
Methyl ethyl ketone peroxide (R,T)	1338234		10	
Methyl hydrazine	60344	500	10	P
Methyl iodide	74884		100	
Methyl isobutyl ketone	108101		5,000	
Methyl isocyanate	624839	500	10	P
Methyl isothiocyanate	556616	500	1	
2-Methylactonitrile	75865		10	P
Methyl mercaptan	74931	500	100	
Methyl methacrylate (I,T)	80626		1,000	
Methyl parathion	298000		100	P
Methyl phenkapton	3735237	500	1	
Methyl phosphonic dichloride	676971	100	1	
4-Methyl-2-pentanone (I)	108101		5,000	
Methyl tert-butyl ether	1634044		1,000	
Methyl thiocyanate	556649	10,000	1	
Methylthiouracil	56042		10	
Methyl vinyl ketone	78944	10	1	
Methylmercuric dicyanamide	502396	500/10,000	1	
Methyltrichlorosilane	75796	500	1	
Metolcarb	1129415	100/10,000	1	
Mevinphos	7786347	500	10	
Mexacarbate	315184	500/10,000	1,000	
Mitomycin C	50077	500/10,000	10	
MNNG	70257		10	
Monocrotophos	6923224	10/10,000	1	
Monoethylamine	75047		100	
Monomethylamine	74895		100	
Muscimol	2763964	500/10,000	1,000	P

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
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		10	
1-Naphthalenamine	134327		100	
2-Naphthalenamine (beta-Naphthylamine)	91598		1	
Naphthalenamine, N,N'-bis(2-chloroethyl)-	494031		100	
Naphthalene	91203		100	
Naphthalene, 2-chloro-	91587		5,000	
1,4-Naphthalenedione	130154		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		10	
Naphthenic acid	1338245		100	
1,4-Naphthoquinone	130154		5,000	
alpha-Naphthylamine	134327		100	
beta-Naphthylamine (2-Naphthalenamine)	91598		1	
alpha-Naphthylthiourea	86884		100	P
Nickel ⁴	7440020		100	
Nickel ammonium sulfate	15699180		100	
Nickel carbonyl	13463393	1	10	P
Nickel carbonyl Ni(CO) ₄ , (T-4)-	13463393		10	P
Nickel chloride	7718549 37211055		100	
Nickel cyanide	557197		10	P
Nickel hydroxide	12054487		10	
Nickel nitrate	14216752		100	
Nickel sulfate	7786814		100	
Nicotine & salts	54115	100	100	P
Nicotine sulfate	65305	100/10,000	1	
Nitric acid	7697372	1,000	1,000	
Nitric acid, thallium(1+) salt	10102451		100	
Nitric oxide	10102439	100	10	P
p-Nitroaniline	100016		5,000	P
Nitrobenzene (I,T)	98953	10,000	1,000	
4-Nitrobiphenyl	92933		10	
Nitrocyclohexane	1122607	500	1	
Nitrogen dioxide	10102440 10544726	100	10	P
Nitrogen oxide	10102439		10	P
Nitroglycerine	55630		10	P
Nitrophenol (mixed):	25154556		100	
m-Nitrophenol	554847		100	
o-Nitrophenol (2)	88755		100	
p-Nitrophenol (4)	100027		100	
2-Nitropropane (I,T)	79469		10	
N-Nitrosodi-n-butylamine	924163		10	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
N-Nitrosodiethanolamine	1116547		1	
N-Nitrosodiethylamine	55185		1	
N-Nitrosodimethylamine	62759	1,000	10	P
N-Nitrosodiphenylamine	86306		100	
N-Nitroso-N-ethylurea	759739		1	
N-Nitroso-N-methylurea	684935		1	
N-Nitroso-N-methylurethane	615532		1	
N-Nitrosomethylvinylamine	4549400		10	P
N-Nitrosomorpholine	59892		1	
N-Nitrosopiperidine	100754		10	
N-Nitrosopyrrolidine	930552		1	
Nitrotoluene: m-Nitrotoluene o-Nitrotoluene p-Nitrotoluene	1321126 99081 88722 99990		1,000	
5-Nitro-o-toluidine	99558		100	
Norbromide	991424	100/10,000	1	
Octamethylpyrophosphoramidate	152169		100	P
Organorhodium complex (PMN-82-147)	0	10/10,000	1	
Osmium tetroxide	20816120		1,000	P
Ouabain	630604	100/10,000	1	
7-Oxabicyclo[2,2,1]heptane-2,3-dicarboxylic acid	145733		1,000	P
Oxamyl	23135220	100/10,000	1	P
1,2-Oxathiolane, 2,2-dioxide	1120714		10	
2H-1,3,2-Oxazaphosphorin-2-amine, N,N bis (2-chloroethyl)tetrahydro-, 2-oxide	50180		10	
Oxetane, 3,3-bis(chloromethyl)-	78717	500	1	
Oxirane (I,T)	75218		10	
Oxiranecarboxyaldehyde	765344		10	
Oxirane, (chloromethyl)-	106898		100	
Oxydisulfoton	2497076	500	1	
Ozone	10028156	100	1	
Paraformaldehyde	30525894		1,000	
Paraldehyde	123637		1,000	
Paraquat	1910425	10/10,000	1	
Paraquat methosulfate	2074502	10/10,000	1	
Parathion	56382	100	10	P
Parathion-methyl	298000	100/10,000	100	
Paris green	12002038	500/10,000	100	
PCBs: Aroclor 1016 Aroclor 1221 Aroclor 1232 Aroclor 1242 Aroclor 1248 Aroclor 1254 Aroclor 1260	1336363 12674112 11104282 11141165 53469219 12672296 11097691 11096825		1 1 1 1 1 1 1	
PCNB (Pentachloronitrobenzene)	82688		100	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Pentaborane	19624227	500	1	
Pentachlorobenzene	608935		10	
Pentachloroethane	76017		10	
Pentachlorophenol	87865		10	
Pentachloronitrobenzene (PCNB)	82688		100	
Pentadecylamine	2570265	100/10,000	1	
Paracetic acid	79210	500	1	
1,3-Pentadiene (I)	504609		100	
Perachloroethylene	127184		100	
Perchloromethylmercaptan	594423	500	100	
Phenacetin	62442		100	
Phenanthrene	85018		5,000	
Phenol	108952	500/10,000	1,000	
Phenol, 2-chloro-	95578		100	
Phenol, 4-chloro-3-methyl-	59507		5,000	
Phenol, 2-cyclohexyl-4,6-dinitro-	131895		100	P
Phenol, 2,4-dichloro-	120832		100	
Phenol, 2,6-dichloro-	87650		100	
Phenol, 4,4'-(1,2-diethyl-1,2-ethenediyl)bis-, (E)	56531		1	
Phenol, 2,4-dimethyl-	105679		100	
Phenol, 2,4-dinitro-	51285		10	P
Phenol, methyl-: m-Cresol o-Cresol p-Cresol	1319773 108394 95487 106445		1,000	
Phenol, 2-methyl-4,6-dinitro-and salts	534521		10	P
Phenol, 2,2'-methylenebis[3,4,6-trichloro-	70304		100	
Phenol, 2,2'-thiobis(4-chloro-6-methyl)-	4418660	100/10,000	1	
Phenol, 2-(1-methylpropyl)-4,6-dinitro	88857		1,000	P
Phenol, 3-(1-methylethyl)-, methylcarbamate	64006	500/10,000	1	
Phenol, 4-nitro-	100027		100	
Phenol, pentachloro-	87865		10	
Phenol, 2,3,4,6-tetrachloro-	58902		10	
Phenol, 2,4,5-trichloro-	95954		10	
Phenol, 2,4,6-trichloro-	88062		10	
Phenol, 2,4,6-trinitro-, ammonium salt	131748		10	P
Phenoxarsine, 10,10'-oxydi-	58366	500/10,000	1	
L-Phenylalanine, 4-[bis(2-chloroethyl)aminol]	148823		1	
Phenyl dichloroarsine	696286	500	1	
1,10-(1,2-Phenylene)pyrene	193395		100	
p-Phenylenediamine	106503		5,000	
Phenylhydrazine hydrochloride	59881	1,000/10,000	1	
Phenylmercury acetate	62384	500/10,000	100	P
Phenylsilatrane	2097190	100/10,000	1	
Phenylthiourea	103855	100/10,000	100	P
Phorate	298022	10	10	P
Phosacetim	4104147	100/10,000	1	
Phosfolan	947024	100/10,000	1	
Phosgene	75445	10	10	P

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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		100	P
Phosphoric acid, dimethyl 4-(methylthio) phenyl ester	3254635	500	1	
Phosphoric acid, lead(2+) salt (2:3)	7446277	500	10	
Phosphorodithioic acid, O,O-diethyl S-[2 (ethylthio)ethyl]ester	298044		1	P
Phosphorodithioic acid, O,O-diethyl S-(ethylthio), methyl ester	298022		10	P
Phosphorodithioic acid, O,O-diethyl S-methyl ester	3288582		5,000	
Phosphorodithioic acid, O,O-dimethyl S-[2(methyl-amino)-2-oxoethyl] ester	60515		10	P
Phosphorofluondic acid, bis(1-methylethyl) ester	55914		100	P
Phosphorothioic acid, O,O-diethyl O-(4-nitrophenyl) ester	56382		10	P
Phosphorothioic acid, O,[4-[(dime-thylamino)sulfonyl]phenyl]O,O-dimethyl ester	52857		1,000	P
Phosphorothioic acid, O,O-dimethyl O-(4-nitrophenyl) ester	298000		100	P
Phosphorothioic acid, 0,0-diethyl 0 pyrazinyl ester	297972		100	P
Phosphorus	7723140	100	1	
Phosphorus oxychloride	10025873	500	1,000	
Phosphorous pentachloride	10026138	500	1	
Phosphorus pentasulfide (R)	1314803		100	
Phosphorus pentoxide	1314563	10	1	
Phosphorus trichloride	7719122	1,000	1,000	
Phthalic anhydride	85449		5,000	
Physostigmine	57476	100/10,000	1	P
Phosostigmine, salicylate (1:1)	57647	100/10,000	1	
2-Picoline	109068		5,000	
Picotoxin	124878	500/10,000	1	
Piperidine	110894	1,000	1	
Piperidine, 1-nitroso-	100754		10	
Pirimifos-ethyl	23505411	1,000	1	
Plumbane, tetraethyl-	78002		10	P

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Polychlorinated biphenyls (See PCBs or Aroclor)	1336363		1	
Potassium arsenate	7784410		1	
Potassium arsenite	10124502	500/10,000	1	
Potassium bichromate	7778509		10	
Potassium chromate	7789006		10	
Potassium cyanide	151508	100	10	P
Potassium hydroxide	1310583		1,000	
Potassium permanganate	7722647		100	
Potassium silver cyanide	506616	500	1	P
Promecarb	2631370	500/10,000	1	
Pronamide	23950585		5,000	
Propanal, 2-methyl-2-(methylthio)-, O- [(methylamino)carbonyl]oxime	116063		1	P
1-Propanamine (I,T)	107108		5,000	
1-Propanamine, N-propyl-	142847		5,000	
1-Propanamine, N-nitroso-N-propyl-	621647		10	
Propane, 1,2-dibromo-3-chloro	96128		1	
Propane, 2-nitro- (I,T)	79469		10	
1,3-Propane sultone	1120714		10	
Propane 1,2-dichloro-	78875		1,000	
Propanedinitrile	109773		1,000	
Propanenitrile	107120		10	P
Propanenitrile, 3-chloro-	542767		1,000	P
Propanenitrile, 2-hydroxy-2-methyl-	75865		10	P
Propane, 2,2'-oxybis[2-chloro-	108601		1,000	
1,2,3-Propanetrol, trinitrate- (R)	55630		10	P
1-Propanol, 2,3-dibromo-, phosphate (3:1)	126727		10	
1-Propanol, 2-methyl- (I,T)	78831		5,000	
2-Propanone (I)	67641		5,000	
2-Propanone, 1-bromo-	598312		1,000	P
Propargite	2312358		10	
Propargyl alcohol	107197		1,000	P
Propargyl bromide	106967	10	1	
2-Propenal	107028		1	P
2-Propenamide	79061		5,000	
1-Propene, 1,1,2,3,3,3-hexachloro-	1888717		1,000	
1-Propene, 1,3-dichloro-	542756		100	
2-Propenenitrile	107131		100	
2-Propenenitrile, 2-methyl- (I,T)	126987		1,000	
2-Propenoic acid (I)	79107		5,000	
2-Propenoic acid, ethyl ester (I)	140885		1,000	
2-Propenoic acid, 2-methyl-, ethyl ester	97632		1,000	
2-Propenoic acid, 2-methyl-, methyl ester (I,T)	80626		1,000	
2-Propen-1-ol	107186		100	P
Propiolactone, beta-	57578	500	1	
Propionaldehyde	123386		1,000	
Propionic acid	79094		5,000	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Propionic acid, 2-(2,4,5-trichlorophenoxy)-	93721		100	
Propionic anhydride	123626		5,000	
Propoxor (Baygon)	114261		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		5,000	
Propyl chloroformate	109615	500	1	
Propylene dichloride	78875		1,000	
Propylene oxide	75569	10,000	100	
1,2-Propylenimine	75558	10,000	1	P
2-Propyn-1-ol	107197		1,000	P
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		5,000	
4-Pyridinamine	504245		1,000	P
Pyridine	110861		1,000	
Pyridine, 2-methyl-	109068		5,000	
Pyridine, 2-methyl-5-vinyl-	140761	500	1	
Pyridine, 4-amino-	504245	500/10,000	1,000	
Pyridine, 4-nitro-, 1-oxide	1124330	500/10,000	1	
Pyridine, 3-(1-methyl-2-pyrrolidinyl)-, (S)	54115		100	P
2,4-(1H,3H)-Pyrimidinedione, 5-[bis(2-chloroethyl)amino]-	66751		10	
4(1H)-Pyrimidinone, 2,3-dihydro-6-methyl-2-thio-	56042		10	
Pyriminil	53558251	100/10,000	1	
Pyrrolidine, 1-nitroso-	930552		1	
Quinoline	91225		5,000	
Quinone (p-Benzoquinone)	106514		10	
Quintobenzene	82688		100	
Reserpine	50555		5,000	
Resorcinol	108463		5,000	
Saccharin and salts	81072		100	
Salcomine	14167181	500/10,000	1	
Sarin	107448	10	1	
Safrole	94597		100	
Selenious acid	7783008	1,000/10,000	10	
Selenious acid, dithallium (1+) salt	12039520		1,000	P
Selenium ⁴	7782492		100	
Selenium dioxide	7446084		10	
Selenium oxychloride	7791233	500	1	
Selenium sulfide (R,T)	7488564		10	
Selenourea	630104		1,000	P
Semicarbazide hydrochloride	563417	1,000/10,000	1	
L-Serine, diazoacetate (ester)	115026		1	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Silane, (4-aminobutyl)diethoxymethyl-	3037727	1,000	1	
Silver ⁴	7440224		1,000	
Silver cyanide	506649		1	P
Silver nitrate	7761888		1	
Silvex (2,4,5-TP)	93721		100	
Sodium	7440235		10	
Sodium arsenate	7631892	1,000/10,000	1	
Sodium arsenite	7784465	500/10,000	1	
Sodium azide	26628228	500	1,000	P
Sodium bichromate	10588019		10	
Sodium bifluoride	1333831		100	
Sodium bisulfite	7631905		5,000	
Sodium cacodylate	124652	100/10,000	1	
Sodium chromate	7775113		10	
Sodium cyanide	143339	100	10	P
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		1	
Strontium chromate	7789062		10	
Strychnidin-10-one	57249		10	P
Strychnidin-10-one, 2,3-dimethoxy-	357573		100	P
Strychnine, & salts	572494	100/10,000	10	P
Strychnine sulfate	60413	100/10,000	1	
Styrene	100425		1,000	
Styrene oxide	96093		100	
Sulfotep	3689245	500	100	
Sulfoxide, 3-chloropropyl octyl	3569571	500	1	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Sulfur monochloride	12771083		1,000	
Sulfur dioxide	7446095	500	1	
Sulfur phosphide (R)	1314803		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		100	P
Sulfuric acid, dimethyl ester	77781		100	
Tabun	77816	10	1	
2,4,5-T acid	93765		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		1,000	
TDE (Dichloro diphenyl dichloroethane)	72548		1	
TEPP (Tetraethyl ester diphosphoric acid)	107493	100	10	
Terbufos	13071799	100	1	
1,2,4,5-Tetrachlorobenzene	95943		5,000	
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746016		1	
1,1,1,2-Tetrachloroethane	630206		100	
1,1,2,2-Tetrachloroethane	79345		100	
Tetrachloroethene	127184		100	
Tetrachloroethylene	127184		100	
2,3,4,6-Tetrachlorophenol	58902		10	
Tetraethyl lead	78002	100	10	P
Tetraethyl pyrophosphate	107493		10	P
Tetraethyldithiopyrophosphate	3689245		100	P
Tetraethyltin	597648	100	1	
Tetramethyllead	75741	100	1	
Tetrahydrofuran (I)	109999		1,000	
Tetranitromethane (R)	509148	500	10	P
Tetraphosphoric acid, hexaethyl ester	757584		100	P
Thallic oxide	1314325		100	P
Thallium ⁴	7440280		1,000	
Thallium acetate	563688		100	
Thallium carbonate	6533739		100	
Thallium chloride	7791120		100	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Thallium nitrate	10102451		100	
Thallium oxide	1314325		100	P
Thallium selenite	12039520		1,000	P
Thallium sulfate	7446186 10031591	100/10,000	100	P
Thallos carbonate (Thallium (I) carbonate)	6533739	100/10,000	100	
Thallos chloride (Thallium (I) chloride)	7791120	100/10,000	100	
Thallos malonate (Thallium (I) malonate)	2757188	100/10,000	1	
Thallos sulfate (Thallium (I) sulfate)	7446186	100/10,000	100	P
Thioacetamide	62555		10	
Thiocarbazine	2231574	1,000/10,000	1	
Thiodiphosphoric acid, tetraethyl ester	3689245		100	P
Thiofanox	39196184	100/10,000	100	P
Thioimidodicarbonic diamide [(H ₂ N)C(S)] ₂ NH	541537		100	P
Thiomethanol (I,T)	74931		100	
Thionazin	297972	500	100	
Thioperoxydicarbonic diamide [(H ₂ N)C(S)] ₂ S ₂ , tetra-methyl-	137268		10	
Thiophenol	108985	500	100	P
Thiosemicarbazide	79196	100/10,000	100	P
Thiourea	62566		10	
Thiourea, (2-chlorophenyl)-	5344821	100/10,000	100	P
Thiourea, (2-methylphenyl)-	614788	500/10,000	1	
Thiourea, 1-naphthalenyl-	86884		100	P
Thiourea, phenyl-	103855		100	P
Thiram	137268		10	
Titanium tetrachloride	7550450	100	1,000	
Toluene	108883		1,000	
Toluenediamine	95807 496720 823405 25376458		10	
Toluene diisocyanate (R,T)	584849 91087 26471625	500	100	
o-Toluidine	95534		100	
p-Toluidine	106490		100	
o-Toluidine hydrochloride	636215		100	
Toxaphene	8001352		1	P
2,4,5-TP acid	93721		100	
2,4,5-TP acid esters	32534955		100	
1H-1,2,4-Triazol-3-amine	61825		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	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
1,1,1-Trichloroethane	71556		1,000	
1,1,2-Trichloroethane	79005		100	
Trichloroethene	79016		100	
Trichloroethylene	79016		100	
Trichloroethylsilane	115219	500	1	
Trichloronate	327980	500	1	
Trichloromethanesulfonyl chloride	594423		100	P
Trichloromonofluoromethane	75694		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		10	
2,4,6-Trichlorophenol	88062		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	
Trimethylchlorosilane	75774	1,000	1	
2,2,4-Trimethylpentane	540841		1,000	
Trimethylolpropane phosphite	824113	100/10,000	1	
Trimethyltin chloride	1066451	500/10,000	1	
1,3,5-Trinitrobenzene (R,T)	99354		10	
1,3,5-Trioxane, 2,4,6-trimethyl-	123637		1,000	
Triphenyltin chloride	639587	500/10,000	1	
Tris(2-chloroethyl)amine	555771	100	1	
Tris(2,3-dibromopropyl) phosphate	126727		10	
Trypan blue	72571		10	
Unlisted Hazardous Wastes Characteristic of Ignitability	NA		100	
Unlisted Hazardous Wastes Characteristic of Corrosivity	NA		100	
Unlisted Hazardous Wastes Characteristic of Reactivity	NA		100	
Unlisted Hazardous Wastes Characteristic of Toxicity:				
Arsenic			1	
Barium			1000	
Benzene			10	
Cadmium			10	
Carbon Tetrachloride			10	
Chlordane			1	
Chlorobenzene			100	
Chloroform			10	

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Chromium			10	
o-Cresol			100	
m-Cresol			100	
p-Cresol			100	
Cresol			100	
2,4-D (Dichlorophenoxyacetic acid)			100	
1,4-Dichlorobenzene			100	
1,2-Dichloroethane			100	
1,1-Dichloroethylene			100	
2,4-Dinitrotoluene			10	
Endrin			1	
Heptachlor (and epoxide)			1	
Hexachlorobenzene			10	
Hexachlorobutadiene			1	
Hexachloroethane			100	
Lead			10	
Lindane			1	
Mercury			1	
Methoxychlor			1	
Methyl ethyl ketone			5,000	
Nitrobenzene			1,000	
Pentachlorophenol			10	
Pyridine			1,000	
Selenium			10	
Silver			1	
Tetrachloroethylene			100	
Toxaphene			1	
Trichloroethylene			100	
2,4,5 Trichlorophenol			10	
2,4,5-TP			100	
Vinyl chloride			1	
Uracil mustard	66751		10	
Uranyl acetate	541093		100	
Uranyl nitrate	10102064 36478769		100	
Urea, N-ethyl-N-nitroso	759739		1	
Urea, N-methyl-N-nitroso	684935		1	
Urethane (Carbamic acid ethyl ester)	51796		100	
Valinomycin	2001958	1,000/10,000	1	
Vanadic acid, ammonium salt	7803556		1,000	P
Vanadic oxide V ₂ O ₅	1314621		1,000	P
Vanadic pentoxide	1314621		1,000	P
Vanadium pentoxide	1314621	100/10,000	1,000	
Vanadyl sulfate	27774136		1,000	
Vinyl chloride	75014		1	
Vinyl acetate	108054		5,000	
Vinyl acetate monomer	108054	1,000	5,000	
Vinylamine, N-methyl-N-nitroso-	4549400		10	P

Hazardous Substance/Material	CAS No. ¹	Threshold Planning Quantity (Pounds) ²	RQ (Pounds) ³	HW Designator
Vinyl bromide	593602		100	
Vinylidene chloride	75354		100	
Warfarin, & salts, when present at concentrations greater than 0.3%	81812	500/10,000	100	P
Warfarin sodium	129066	100/10,000	100	
Xylene (mixed):	1330207		100	
m-Benzene, dimethyl	108383		1,000	
o-Benzene, dimethyl	95476		1,000	
p-Benzene, dimethyl	106423		100	
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		5,000	
Zinc ⁴	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		10	P
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	100	P
Zinc phosphide Zn ₃ P ₂ , when present at concentrations greater than 10%	1314847		100	P
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	

Notes:

1. Chemical Abstract Service (CAS) Registry Number.
2. Quantity in storage above which DoD LEC must be notified (See Chapter 5, "Hazardous Material").
3. Reportable quantity release which requires notification (See Chapter 18, "Spill Prevention & Response Planning").
4. No reporting of releases of this hazardous substance is required if the diameter of the pieces of the solid metal released is ≥ 100 micrometers (0.004 inches).

5. The RQ for asbestos is limited to friable forms only.
6. Includes mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol $R-(OCH_2CH_2)_n-OR'$. Where $n = 1, 2, \text{ or } 3$; $R = \text{alkyl C7 or less}$; or $R = \text{phenyl or alkyl substituted phenyl}$; $R' = H \text{ or alkyl C7 or less}$; or OR' consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.
- ** Indicates that no RQ is being assigned to the generic or broad class.

APB1. APPENDIX B.1 – HAZARDOUS PROPERTIES

H1	EXPLOSIVE: substances and preparations which may explode under the effect of flame or which are more sensitive to shocks or friction than dinitrobenzene.
H2	OXIDIZING: substances and preparations which exhibit highly exothermic reactions when in contact with other substances, particularly flammable substances.
H3-A	HIGHLY FLAMMABLE: - liquid substances and preparations having a flash point < 21 °C (including extremely flammable liquids), or - substances and preparations which may become hot and finally catch fire in contact with air at ambient temperature without any application of energy, or - solid substances and preparations which may readily catch fire
H3-B	FLAMMABLE: liquid substances and preparations having a flash point ≥ 21 °C and ≤ 55 °C.
H4	IRRITANT: non-corrosive substances and preparations which, through immediate, prolonged or repeated contact with skin or mucose membrane, can cause inflammation.
H5	HARMFUL; substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may involve limited health risks.
H6	TOXIC; substances and preparations (including very toxic substances and preparations) which, if they are inhaled or ingested or if they penetrate the skin, may involve serious, acute or chronic health risks and even death.
H7	CARCINOGENIC: substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce cancer or increase its incidence.
H8	CORROSIVE: substances and preparations which may destroy living tissue on contact.
H9	INFECTIOUS: substances containing viable micro-organisms or their toxins which are known or reliably believed to cause disease in man or other living organisms.
H10	TERATOGENIC: substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce non-hereditary congenital malformations or increase their incidence.
H11	MUTAGENIC: substances and preparations which, if they are inhaled or ingested or if they penetrate the skin, may induce hereditary genetic defects or increase their incidence.
H12	Substances and preparations which release toxic or very toxic gases in contact with water, air or an acid.
H13	SENSITIZING: substances and preparations which, if they are inhaled or if they penetrate the skin, are capable of eliciting a reaction of hypersensitization such that on further exposure to the substance or preparation, characteristic adverse effects are produced.
H14	ECOTOXIC: substances and preparations which present or may present immediate or delayed risks for one or more sectors of the environment.
H15	Substances and preparations capable by any means, after disposal, of yielding another substance (e.g. a leachate), which possesses any of the characteristics listed

	above.
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APB1.2 THRESHOLDS FOR CERTAIN HAZARDOUS PROPERTIES

Wastes are classified as hazardous if they have one or more of the following characteristics:

(a)	Flash point $\leq 55^{\circ}\text{C}$
(b)	One or more substances classified as very toxic at a total concentration $\geq 0.1\%$
(c)	One or more substances classified as toxic at a total concentration $\geq 3\%$
(d)	One or more substances classified as harmful at a total concentration $\geq 25\%$
(e)	One or more corrosive substances classified as R35 at a total concentration $\geq 1\%$
(f)	One or more corrosive substances classified as R34 at a total concentration $\geq 5\%$
(g)	One or more irritant substances classified as R41 at a total concentration $\geq 10\%$
(h)	One or more irritant substances classified as R36, R37, R38 at a total concentration $\geq 20\%$
(i)	One substance known to be carcinogenic of category 1 or 2 at a concentration $\geq 0.1\%$
(j)	One substance known to be carcinogenic of category 3 at a concentration $\geq 1\%$
(k)	One substance toxic for reproduction of category 1 or 2 classified as R60, R61 at a concentration $\geq 0.5\%$
(l)	One substance toxic for reproduction of category 3 classified as R62, R63 at a concentration $\geq 5\%$
(m)	One mutagenic substance of category 1 or 2 classified as R46 at a concentration $\geq 0.1\%$
(n)	One mutagenic substance of category 3 classified as R40 at a concentration $\geq 1\%$

Category	Description
D1	Open ground storage (e.g., landfills) – <i>Deposito sul o nel suolo (a esempio discarica)</i>
D2	Treatment on land (e.g., liquid wastes or sludge biodegradation on soils) – <i>Trattamento in ambiente terrestre (a esempio biodegradazione di rifiuti liquidi o fanghi nei suoli)</i>
D3	Deep injection (e.g., waste injection into wells, salt domes, or natural geological faults) – <i>Iniezioni in profondità (a esempio iniezioni dei rifiuti pompabili in pozzi, in cupole saline o faglie geologiche naturali)</i>
D4	Surface impoundments (e.g., discharge of liquid waste or sludge into wells, ponds, lagoons, etc.) – <i>Lagunaggio (a esempio scarico di rifiuti liquidi o di fanghi in pozzi, stagni o lagune, ecc.)</i>
D5	Specially equipped landfills (e.g., placing waste in separate airtight cells, covered and isolated from each other and from the environment) – <i>Messa in discarica specialmente allestita (a esempio sistematizzazione in alveoli stagni separati, ricoperti o isolati gli uni dagli altri e dall'ambiente)</i>
D6	Discharge of solid waste into water, except for immersion – <i>Scarico dei rifiuti solidi nell'ambiente idrico eccetto l'immersione</i>
D7	Immersion, including landfills under the sea subsoil – <i>Immersione, compreso il seppellimento nel sottosuolo marino</i>
D8	Biological treatment not specified in this Appendix, resulting in compounds and mixtures eliminated according to one of the processes included in Categories D1 to D12 – <i>Trattamento biologico non specificato altrove nel presente allegato, che dia origine a composti o a miscugli che vengono eliminati secondo uno dei procedimenti elencati nei punti da D1 a D12</i>
D9	Physical and chemical treatment not specified in this Appendix, resulting in compounds and mixtures eliminated according to one of the processes included in Categories D1 to D12 (e.g., evaporation, drying processes, cementation, etc.) – <i>Trattamento fisico-chimico non specificato altrove nel presente allegato che dia origine a composti o a miscugli eliminati secondo uno dei procedimenti elencati nei punti da D1 a D12 (a esempio evaporazione, essiccazione, calcinazione, ecc.)</i>
D10	Incineration on land – <i>Incenerimento a terra</i>
D11	Incineration at sea – This activity is not permitted. <i>Incenerimento in mare – Questa operazione è vietata</i>
D12	Permanent storage (e.g., emplacement of containers in a mine, etc.) – <i>Deposito permanente (a esempio sistemazione di contenitori in una miniera, ecc.)</i>
D13	Preliminary collection prior to one of the processes listed in Categories D1 to D12; to be used in the cases when a different D-code suitable for the activity is not available (D13 can be used to cover preliminary processing of waste such as sorting, fragmentation, compaction, pelletizing, drying, shredding, conditioning – <i>Raggruppamento preliminare prima di una delle operazioni di cui ai punti da D1 a D12. In mancanza di un altro codice D appropriato, può comprendere le operazioni preliminari precedenti allo smaltimento, incluso il pretrattamento come, tra l'altro, la cernita, la frammentazione, la compattazione, la pellettizzazione, l'essiccazione, la triturazione, il condizionamento o la separazione prima di una delle operazioni indicate da D1 a D12</i>
D14	Preliminary reconditioning prior to one of the processes listed in Categories D1 to D12 – <i>Ricondizionamento preliminare prima di una delle operazioni di cui ai punti da D1 a D13</i>
D15	Preliminary storage prior to one of the processes listed in D1 to D14 (except for temporary storage before waste collection at the site where it is produced) – <i>Deposito preliminare prima di una delle operazioni di cui ai punti da D1 a D14 (escluso il deposito temporaneo, prima della raccolta, nel luogo in cui sono prodotti)</i>

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Category	Description
R1	Main use as fuel or as other means of producing energy. In case of incineration, the activity is classified as recovery “R” provided that the incinerator meets energy efficiency targets of 0.6 for plants installed before year 2009, or of 0.65 for plants installed after year 2009 – <i>Utilizzazione principale come combustibile o come altro mezzo per produrre energia. Gli impianti di incenerimento dei rifiuti solidi urbani sono compresi solo se la loro efficienza energetica è uguale o superiore a 0.6 per impianti anteriori al 2009, o superiore a 0.65 per impianti successivi al 2009</i>
R2	Solvent regeneration and recovery – <i>Rigenerazione/recupero di solventi</i>
R3	Organic substance recycling and recovery not used as solvents (including composting processes and other biological transformations). Includes gasification and pyrolysis where the substances are used as chemicals – <i>Riciclo/recupero delle sostanze organiche non utilizzate come solventi (comprese le operazioni di compostaggio e altre trasformazioni biologiche). Sono comprese la gassificazione e la pirolisi che utilizzano i componenti come sostanze chimiche</i>
R4	Metal or metallic component recycling or recovery – <i>Riciclo/recupero dei metalli e dei composti metallici</i>
R5	Other inorganic substance recycling and recovery. It includes the cleaning activities resulting in the re-use of soil, and the recycling of inorganic construction material – <i>Riciclo/recupero di altre sostanze inorganiche. È compresa la pulizia risultante in un recupero del suolo e il riciclaggio dei materiali da costruzione inorganici</i>
R6	Acid or base regeneration – <i>Rigenerazione degli acidi o delle basi</i>
R7	Recovery of products useful to capture pollutants – <i>Recupero dei prodotti che servono a captare gli inquinanti</i>
R8	Recovery of products from catalysts – <i>Recupero dei prodotti provenienti dai catalizzatori</i>
R9	Oil regeneration and other re-utilization of oils – <i>Rigenerazione o altri reimpieghi degli oli</i>
R10	Spreading on soil for the benefit of agriculture or ecology – <i>Spandimento sul suolo a beneficio dell'agricoltura o dell'ecologia</i>
R11	Use of wastes from one of the processes in R1 to R10 – <i>Utilizzazione di rifiuti ottenuti da una delle operazioni indicate da R1 a R10</i>
R12	Exchanging wastes in order to subject them to one of the processes in R1 to R11; to be used in the cases when a different R-code suitable for the activity is not available (R12 can be used to cover preliminary processing of waste such as sorting, fragmentation, compaction, pelletizing, drying, shredding, conditioning – <i>Scambio di rifiuti per sottoporli a una delle operazioni indicate da R1 a R11. In mancanza di un altro codice R appropriato, può comprendere le operazioni preliminari precedenti al recupero, incluso il pretrattamento come, tra l'altro, la cernita, la frammentazione, la compattazione, la pellettizzazione, l'essiccazione, la triturazione, il condizionamento, il ricondizionamento, la separazione, il raggruppamento prima di una delle operazioni indicate da R1 a R11</i>
R13	Waste stockpiling in order to subject them to one of the processes in R1 to R12 (except for temporary storage before waste collection at the site where it is produced) – <i>Messa in riserva di rifiuti per sottoporli a una delle operazioni indicate nei punti da R1 a R12 (escluso il deposito temporaneo, prima della raccolta, nel luogo in cui sono prodotti)</i>

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APB4. APPENDIX B.4TYPICAL NON-HAZARDOUS WASTE RECOVERY ACTIVITIES

NOTE: Appendix B.4 lists the types of non-hazardous waste (and their related codes) applicable to waste recovery under simplified authorization procedures, as well as applicable waste recovery activities. Only the most significant have been reported hereunder (contact DoD LEC for more information, as necessary).

Tabella 1 - Suballegato 1**NORME TECNICHE GENERALI PER IL RECUPERO DI MATERIA DAI RIFIUTI NON PERICOLOSI****Table 1 - Sub-Annex 1****TECHNICAL RULES FOR THE RECOVERY OF MATERIAL FROM NON-HAZARDOUS WASTE****1. RIFIUTI DI CARTA, CARTONE E PRODOTTI DI CARTA/PAPER AND CARDBOARD WASTE**

1.1 **Tipologia:** rifiuti di carta, cartone e cartoncino, inclusi poliaccoppiati, anche di imballaggi. [150101] [150105] [150106][200101]

1.1 **Type:** paper and cardboard waste, included those from mixed joined materials, also from packaging [150101] [150105] [150106][200101]

1.1.1 **Provenienza:** attività produttive: raccolta differenziata di RU, altre forme di raccolta in appositi contenitori su superfici private; aSeptember 2012attività di servizio.

1.1.1 **Source:** productive activities: Separate Urban Waste collection, other types of collection in dedicated containers on private areas, service activities.

1.1.2 **Caratteristiche del rifiuto:** rifiuti, costituiti da: cartaccia derivante da raccolta differenziata, rifiuti di carte e cartoni non rispondenti alle specifiche delle norme Uni-En 643.

1.1.2 **Waste Characteristics:** residues: Waste paper coming from the separate collection, waste paper and waste cardboards not in compliance with the specifications of Technical Norm Uni-En 643.

1.1.3 Attività di recupero:

a) riutilizzo diretto nell'industria cartaria [R3].

b) messa in riserva [R13] per la produzione di materia prima secondaria per l'industria cartaria mediante selezione, eliminazione di impurezze e di materiali contaminati, compattamento in conformità alle seguenti specifiche [R3]:

impurezze quali metalli, sabbie e materiali da costruzione, materiali sintetici, vetro, carte

prodotte con fibre sintetiche, tessili, legno, nonché altri materiali estranei, max 1% come somma totale; carta carbone, carte bituminate assenti; formaldeide non superiore allo 0,1% in peso; fenolo non superiore allo 0,1% in peso; PCB + PCT < 25 ppm

1.1.3 Recovery activity:

- a) direct recovery in paper mills [R3].
- b) storage [R13] in order to produce the secondary raw material for paper mills by selection and compacting, as allowed by the following specific requirements [R3]:
presence of impurities as metals, sand and construction materials, synthetic materials, glass, papers made by synthetic fibers, textiles, wood, and other extraneous materials, max 1% as total sum; absence of waxed and; absence of bituminized papers; formaldehyde not higher than 0.1 % in weight; phenol not higher than 0.1 % in weight; PCB + PCT < 25 ppm

1.1.4 Caratteristiche delle materie prime e/o dei prodotti ottenuti:

- a) carta, cartone e cartoncino nelle forme usualmente commercializzate;
- b) materie prime secondarie per l'industria cartaria rispondenti alle specifiche delle norme UNI - EN 643.

1.1.4 Characteristics of obtained raw materials and/or products:

- a) paper and cardboard as usually put on the market;
- b) raw materials and secondary raw materials for paper industry meeting UNI - EN 643 standards.

2. RIFIUTI DI VETRO IN FORMA NON DISPERSIBILE/GLASS WASTE

2.1 **Tipologia:** imballaggi, vetro di scarto ed altri rifiuti e frammenti di vetro; rottami di vetro [170202] [200102] [150107] [191205] [160120] [101112].

2.1 **Type:** packaging, glass residues; glass scraps [170202] [200102] [150107] [191205] [160120] [101112].

2.1.1 **Provenienza:** raccolta differenziata in appositi contenitori c/o altre raccolte differenziate; selezione da RSU c/o RAU; attività industriali, artigianali commerciali e di servizi; autodemolizione autorizzate ai sensi del decreto legislativo 5 febbraio 1997, n. 22 e successive modifiche e integrazioni.

2.1.1 **Source:** separate collection, separation from urban waste; residues from industrial or commercial activities, car repairing.

2.1.2 **Caratteristiche del rifiuto:** vetro di scarto con l'esclusione dei vetri da tubi raggio - catodici delle lampade a scarica ed altri vetri contaminati da sostanze radioattive e dei contenitori etichettati come pericolosi ai sensi della legge 29 maggio 1974, n. 256, decreto del Presidente della Repubblica 24 novembre 1981, N. 927 e successive modifiche e integrazioni; non radioattivo ai sensi del decreto legislativo 17 marzo 1995, n. 230.

2.1.2 **Waste characteristics:** glass residues, excluded cathode-ray tubes and other glass contaminated by radioactive substances and containers labeled as hazardous, and non-radioactive.

2.1.3 Attività di recupero:

- a) recupero diretto nell'industria vetraria [R5];
- b) messa in riserva [R13] per la produzione di materie prime secondarie per l'industria vetraria mediante cernita manuale, vagliatura, frantumazione c/o macinazione, separazione metalli magnetici, asportazione dei materiali leggeri, separazione automatica metalli non magnetici, separazione automatica corpi opachi, per l'ottenimento di rottame di vetro pronto al forno con le seguenti caratteristiche: Pb < 0,3 ppm sull'eluato effettuato in base ai criteri riportati nel D.M. 21/3/73 "Disciplina igienica degli imballaggi, recipienti, utensili destinati a venire in contatto con le sostanze alimentari o con sostanze di uso personale" e successive modifiche e integrazioni (Supplemento G.U. n. 104 del 20 aprile 1973); per il rottame di vetro di colore misto pronto al forno: materiale solido costituito da rottame di vetro sodio - calcico con granulometria > 3 mm, ceramica e porcellana < 0,01%, pietre < 0,02%, metalli magnetici < 0,002%, metalli amagnetici < 0,01%, materiali organici < 0,1%, altri vetri 0,5%, umidità < 3% in peso, frazione sottovaglio (< 3 mm) < 5%; per il rottame di vetro di colore giallo, mezzo bianco o bianco pronto al forno: materiale solido costituito da rottame di vetro sodico - calcico con granulometria > 3 mm, ceramica e porcellana < 0,01%, pietre < 0,01%, metalli magnetici < 0,002%, metalli amagnetici 0,01%, (0,003% per il rottame di vetro trasparente), materiali organici < 0,1%, altri vetri < 0,5%, (4% per il rottame di vetro trasparente), umidità < 3% in peso, frazione sottovaglio (< 3 mm) < 5%. [R5];
- c) messa in riserva [R13] per la produzione di materie prime secondarie per l'edilizia, per la formazione di rilevati e sottofondi stradali, riempimenti e colmature, come strato isolante e di appoggio per tubature, condutture e pavimentazioni anche stradali e come materiale di drenaggio, mediante cernita manuale, vagliatura, frantumazione e/o macinazione, separazione metalli magnetici, asportazione dei materiali leggeri, separazione automatica metalli non magnetici, separazione automatica corpi opachi, analisi del contenuto in metalli pesanti, e verifica dei limiti di cui al test di cessione effettuato sul rifiuto tal quale secondo il metodo in allegato 3 al presente decreto [R5].

2.1.3 Recovery activities:

- a) direct recovery in glass manufacturing industry [R5];
- b) storage [R13] in order to produce the secondary raw materials for glass industry, by selection, milling, separation of metals and light materials, to obtain glass scarp with the following characteristics: Pb < 0.3 ppm in the leachate (according to criteria set by Ministerial Decree 21/3/73); for mixed colored glass: solid material made of sodium-calcium glass with size > 3 mm, ceramics and porcelain < 0.01%, stones < 0.02%, magnetic metals < 0.002%, non-magnetic metals < 0.01%, organic materials < 0.1%, other glass 0.5%, humidity < 3% in weight, fine fraction (< 3 mm) < 5%; for yellow or white glass: solid material made of sodium-calcium glass with size > 3 mm, ceramics and porcelain < 0.01%, stones < 0.01%, magnetic metals < 0.002%, non-magnetic metals 0.01%, (0.003% for transparent glass scrap), organic materials < 0.1%, other glass < 0.5%, (4% for transparent glass scrap), humidity < 3% in weight, fine fraction (< 3 mm) < 5%. [R5];
- c) storage [R13] in order to produce the secondary raw materials for building, road foundations, filling material, insulating layer for piping floor or roads, and draining material, by selection, milling, separation of metals and light materials, analysis of heavy metals' content and cession test as per the described method

2.1.4 Caratteristiche delle materie prime e/o dei prodotti ottenuti:

- a) manufatti in vetro;
- b) materie prime secondarie conformi alle specifiche merceologiche fissate dalle CCIAA di Roma e Milano destinate alla produzione di vetro, carta vetro e materiali abrasivi nelle forme usualmente commercializzate;
- c) materie prime secondarie per l'edilizia.

2.1.4 Characteristics of obtained raw materials and/or products:

- a) glass products;
- b) secondary raw materials meeting fixed standards , for the production of glass products;
- c) secondary raw materials for building industry.

3. RIFIUTI DI METALLI E LORO LEGHE SOTTO FORMA METALLICA NON DISPERDIBILE/METAL AND ALLOY WASTE

3.3 Tipologia: sfridi o scarti di imballaggi in alluminio, e di accoppiati carta plastica e metallo [150104] [1501051] [150106] [191203].

3.3 Type: aluminum scraps or residues and residues from mixed paper, plastic and metal products [150104] [1501051] [150106] [191203].

3.3.1 Provenienza: industria cartotecnica; attività industriali, commerciali e di servizio.

3.3.1 Source: industrial, commercial and service activities.

3.3.2 Caratteristiche del rifiuto: sfridi o scarti di imballaggi in alluminio e imballaggi compositi con carta plastica e metallo.

3.3.2 Waste characteristics: scraps or residues of aluminum packaging and mixed paper, plastic, metal packaging.

3.3.3 Eventuale Attività di recupero: macinatone, combustione a 400 - 500 °C per l'eliminazione delle frazioni di plastica e carta [R4].

3.3.3 Possible Recovery activities: milling, combustion at 752 - 932 °F to eliminate plastic and paper fraction [R4].

3.3.4 Caratteristiche delle materie prime e/o dei prodotti ottenuti: alluminio granulare conforme alle norme UNI 3950.

3.3.4 Characteristics of obtained raw materials and/or products: granular aluminum meeting UNI 3950 standards.

6. RIFIUTI DI PLASTICHE/PLASTIC WASTE

6.1 Tipologia: rifiuti di plastica; imballaggi usati in plastica compresi i contenitori per liquidi, con esclusione dei contenitori per fitofarmaci e per presidi medico - chirurgici [020104] [150102] [200103] [200104] [170203] [200139] [191204].

6.1 **Type:** plastic waste; plastic packaging excluding packaging for pesticides and medicines [020104] [150102] [200103] [200104] [170203] [200139] [191204].

6.1.1 **Provenienza:** raccolte differenziate, selezione da R.S.U. o R.A.; attività industriali, artigianali e commerciali e agricole, attività di costruzione e demolizione.

6.1.1 **Source:** separate collection; industrial, commercial, craft and agriculture activities, construction and demolition activities.

6.1.2 **Caratteristiche del rifiuto:** materiali plastici, compresi teli e sacchetti, tubetti per rocche di filati, di varia composizione e forma con eventuale presenza di rifiuti di altra natura.

6.1.2 **Waste characteristics:** plastic materials, including sheets and bags, of different shape and composition, also with other waste.

6.1.3 **Attività di recupero:** messa in riserva [R13] per la produzione di materie prime secondarie per l'industria delle materie plastiche, mediante asportazione delle sostanze estranee (qualora presenti), trattamento per l'ottenimento di materiali plastici conformi alle specifiche UNIPLAST-UNI 10667 e per la produzione di prodotti in plastica nelle forme usualmente commercializzate [R3].

6.1.3 **Recovery activities:** storage [R13] to produce secondary raw materials for plastic manufacturing industry, by separation of extraneous materials, treatment to obtain plastic materials in compliance with the specifications UNIPLAST-UNI 10667 for the productions of plastic products in the forms usually sold on the market.

6.1.4 **Caratteristiche delle materie prime e/o dei prodotti ottenuti:** materie prime secondarie conformi alle specifiche UNIPLAST - UNI 10667 e prodotti in plastica nelle forme usualmente commercializzate.

6.1.4 **Characteristics of obtained raw materials and/or products:** secondary raw materials meeting UNIPLAST - UNI 10667 standards and plastic products in the forms usually sold on the market.

7. RIFIUTI CERAMICI E INERTI/CERAMIC AND INERT WASTE

7.1 **Tipologia:** rifiuti costituiti da laterizi, intonaci e conglomerati di cemento armato e non, comprese le traverse e traversoni ferroviari e i pali in calcestruzzo armato provenienti da linee ferroviarie, telematiche ed elettriche e frammenti di rivestimenti stradali, purché privi di amianto. [101311] [170101] [170102] [170103] [170802] [170107] [170904] [200301].

7.1 **Type:** building materials, concrete, road foundation, with no asbestos [101311] [170101] [170102] [170103] [170802] [170107] [170904] [200301].

7.1.1 **Provenienza:** attività di demolizione, frantumazione e costruzione; selezione da RSU e/o RAU; manutenzione reti; attività di produzione di lastre e manufatti in fibrocemento.

7.1.1 **Source:** building and demolition activities; separate collection; maintaining and repairing of networks; production of cement slabs.

7.1.2 Caratteristiche del rifiuto: materiale inerte, laterizio e ceramica corta anche con presenza di frazioni metalliche, legno, plastica, carta e isolanti escluso amianto.

7.1.2 Waste characteristics: inert material, building materials and ceramic also containing metals, wood, plastic, paper and insulations, excluded asbestos.

7.1.3 Attività di recupero:

- a) messa in riserva di rifiuti inerti [R13] per la produzione di materie prime secondarie per l'edilizia, mediante fasi meccaniche e tecnologicamente interconnesse di macinazione, vagliatura, selezione granulometrica e separazione della frazione metallica e delle frazioni indesiderate per l'ottenimento di frazioni inerti di natura lapidea a granulometria idonea e selezionata, con eluato del test di cessione conforme a quanto previsto in allegato 3 al presente decreto [R5];
- b) utilizzo per recuperi ambientali previo trattamento di cui al punto a) (il recupero è subordinato all'esecuzione del test di cessione sul rifiuto tal quale secondo il metodo in allegato 3 al presente decreto [R10];
- c) utilizzo per la realizzazione di rilevati e sottofondi stradali e ferroviari e aeroportuali, piazzali industriali previo trattamento di cui al punto a) (il recupero è subordinato all'esecuzione del test di cessione sul rifiuto tal quale secondo il metodo in allegato 3 al presente decreto [R5].

7.1.3 Recovery activities:

- a) storage of inert materials [R13] for the secondary raw materials production for building industry by mechanical operations and technologically connected to milling, screening, granulometric selection and separation of the metallic portion and of the unwanted fractions for obtaining inert lapped fractions with a selected and suitable granulometry with compliant leachate test results;
- b) use for environmental recoveries, before treatment of point a) (the recovery is subordinated at the execution of the leachate test on the waste ;
- c) use for road, rail and airport embankments and sub-bases, industrial yards, before the treatment of point a) (the recovery is subordinated at the execution of the leachate test on the waste .

7.1.4 Caratteristiche delle materie prime e/o dei prodotti ottenuti: materie prime secondarie per l'edilizia con caratteristiche conformi all'allegato C della circolare del Ministero dell'ambiente e della tutela del territorio 15 luglio 2005, n. UL/2005/5205

7.1.4 Characteristics of the obtained raw materials and/or products: secondary raw materials for building industry meeting standards.

9. RIFIUTI DI LEGNO E SUGHERO/WOOD AND CORK WASTE

9.1 Tipologia: scarti di legno e sughero, imballaggi di legno [030101] [030105] [150103] [030105] [030199] [170201] [200138] [191207] [200301].

9.1 Type: wood and cork residues, wood packaging [030101] [030105] [150103] [030105] [030199] [170201] [200138] [191207] [200301].

9.1.1 Provenienza: industria edile e raccolta differenziata, attività industriali, artigianati, commerciali, agricole e di servizio; attività di demolizioni.

9.1.1 **Source:** building industry; separate collection; industrial, craft, commercial, and agriculture and service activities; demolitions.

9.1.2 **Caratteristiche del rifiuto:** legno in scarti di diverse dimensioni e segatura, con possibili presenze di polveri di natura inerte; cassette, pallets e altri imballaggi in legno non trattato.. sfridi di pannelli (compensati listellari, di fibra, di particelle ecc.) di legno trattato, nobilitato, compreso MDF, polverino di carteggiatura.

9.1.2 **Waste characteristics:** wood residues, also with inert material's dust, boxes, pallets and other packagings in non-treated wood, residues of treated wood, including dust from sandpapering.

9.1.3 **Attività di recupero:** messa in riserva di rifiuti di legno [R13] con lavaggio eventuale, cernita, adeguamento volumetrico o cippatura per sottoporli alle seguenti operazioni di recupero:

- a) recupero nell'industria della falegnameria e carpenteria [R3];
- b) recupero nell'industria cartaria [R3];
- c) recupero nell'industria del pannello di legno [R3];

9.1.3 **Waste recovery:** storage [R13] also with washing, selection, volume reduction, prior recovery in woodwork and carpentry R3]; in paper mills [R3]; and in wood manufacturing [R3];

9.1.4 **Caratteristiche delle materie prime e/o dei prodotti ottenuti:**

- a) manufatti a base legno e sughero nelle forme usualmente commercializzate;
- b) pasta di carta e carta nelle forme usualmente commercializzate;
- c) pannelli nelle forme usualmente commercializzate.

9.1.4 **Characteristics of raw materials and/or products:**

- a) wood and cork products;
- b) pulp and paper;
- c) panels.

10. RIFIUTI SOLIDI IN CAUCCIU' E GOMMA/CAOUTCHOUC AND RUBBER SOLID WASTE

10.2 **Tipologia:** pneumatici non ricostruibili, camere d'aria non riparabili e altri scarti di gomma [160103].

10.2 **Type:** tires that cannot be re-built, inner tubes and other rubber waste [160103].

10.2.1 **Provenienza:** industria della ricostruzione pneumatici, attività di sostituzione e riparazione pneumatici e attività di servizio, attività di autodemolizione autorizzata ai sensi del decreto legislativo 5 febbraio 1997, n. 22 e successive modifiche e integrazioni, autoriparazione e industria automobilistica.

10.2.1 **Source:** tire-repair industry and tire-repair activities, end-of-life vehicles collection centers, automotive industry.

10.2.2 Caratteristiche del rifiuto: pneumatici usurati e camere d'aria con eventuale presenza di inquinanti superficiali (IPA < 10 ppm); scarti di gomma di varie dimensioni e forme.

10.2.2 Waste Characteristics: used tires and inner tubes, with PAH < 10 ppm; rubber waste.

10.2.3. Attività di recupero: messa in riserva di rifiuti di gomma [R13] con lavaggio, triturazione e/o vulcanizzazione per sottoporli alle seguenti operazioni di recupero:

- a) recupero nell'industria della gomma per mescole compatibili [R3];
- b) recupero nella produzione bitumi [R3];
- c) realizzazione di parabordi previo lavaggio chimico fisico se contaminato, eventuale macinazione, compattazione e devulcanizzazione [R3];

10.2.3. Waste recovery: storage [R13] with washing, grinding and/or vulcanization, in order to recover the waste by:

- a) recovery in the rubber industry in mixtures [R3];
- b) recovery in bitumen production [R3];
- c) production of curbs, after chemical-physical washing if contaminated, or grinding, compacting and de-vulcanization [R3];

10.2.4 Caratteristiche delle materie prime e/o dei prodotti ottenuti:

- a) manufatti in gomma nelle forme usualmente;
- b) e c) bitumi e parabordi nelle forme usualmente commercializzate.

10.2.4 Characteristics of the obtained raw materials and/or products:

- a) products in rubber, as usually put on the market;
- b) e c) bitumen and curbs, as usually put on the market.

13. RIFIUTI CONTENENTI PRINCIPALMENTE COSTITUENTI INORGANICI CHE POSSONO A LORO VOLTA CONTENERE METALLI O MATERIE ORGANICHE/WASTE MAINLY CONTAINING INORGANIC CONSTITUENTS WHICH CAN CONTAIN METALS OR ORGANIC MATERIALS

13.20 Tipologia: gruppo cartuccia toner per stampante laser, contenitori toner per fotocopiatrici, cartucce per stampanti fax e calcolatrici a getto d'inchiostro, cartucce nastro per stampanti ad aghi [080318] [160216].

13.20 Type: cartridges [080318] [160216]

13.20.1 Provenienza: raccolta differenziata da parte dei distributori o di altri operatori specializzati, attività produttive o di servizio.

13.20.1 Source: separate collection

13.20.2 Caratteristiche del rifiuto: contenitore in materiale plastico e/o metallico con tracce di toner o di inchiostro o di nastro inchiostroato.

13.20.2 Waste characteristics: plastic/metal containers containing traces of toner or ink.

13.20.3 **Attività di recupero:** verifica di funzionalità e ricarica del toner, dell'inchiostro o del nastro inchiostro [R5].

13.20.3 **Recovery activity:** check of functionality and toner or ink's re-charge [R5].

13.20.4 **Caratteristiche delle materie prime e/o dei prodotti ottenuti:** contenitore in materiale plastico e metallico con toner, inchiostro o nastro inchiostro nelle forme usualmente commercializzate.

13.20.4 **Characteristics of the obtained raw materials and/or products:** plastic/metal containers with toner or ink, as usually put on the market.

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APB5. APPENDIX B.5TYPICAL HAZARDOUS WASTE RECOVERY ACTIVITIES

NOTE: Appendix B.5 lists the types of hazardous waste (and their related code) applicable to waste recovery under simplified authorization procedures, as well as applicable waste recovery activities. Only the most significant wastes have been reported hereunder (contact DoD LEC for more information, as necessary).

TABELLA 1 - Suballegato 1**NORME TECNICHE GENERALI PER IL RECUPERO DI MATERIA DAI RIFIUTI PERICOLOSI****TABLE 1 – Sub-Annex 1****GENERAL TECHNICAL RULES FOR THE RECOVERY OF MATERIAL FROM HAZARDOUS WASTE****1. METALLI NON FERROSI/NON-FERROUS METALS**

1.4 *Tipologia*: batterie al piombo esauste e di scarto e loro parti [160601*] [200133*].

1.4 *Type*: waste lead batteries and their parts [160601*] [200133*].

1.4.1 *Provenienza*: raccolta finalizzata di batterie al piombo esauste; selezione di qualità da industria produzione accumulatori.

1.4.1 *Source*: separate collection; battery production industry.

1.4.2 *Caratteristiche del rifiuto e valori limite delle sostanze pericolose*: batterie al piombo esauste e di scarto e loro parti, con contenuto di Piombo fino al 90% e contenenti: Sn <1%, As <0,5%, Sb <10%, Se <0,05%; contenenti soluzione acquosa di H₂SO₄ con Pb <1%, Cd < 0,1%, Cu, Zn, As, Sn e Sb < 0,1% per ciascun elemento.

1.4.2 *Waste characteristics and threshold limits for hazardous substance*: waste lead batteries and their parts, with a lead content up to 90% and containing: Sn <1%, As <0.5%, Sb <10%, Se <0.05%; containing water solution of H₂SO₄ with Pb <1%, Cd < 0.1%, Cu, Zn, As, Sn and Sb < 0.1% for each element.

1.4.3 *Attività di recupero*: recupero al ciclo termico o idrometallurgico delle componenti metalliche a base di piombo ottenute mediante pretrattamento di frantumazione e vagliatura per la separazione delle componenti plastiche [R4]; decantazione, filtrazione e/o concentrazione dell'acido solforico [R5].

1.4.3 *Recovery activity*: recovery of metal components obtained by a crushing and riddling pre-treatment, by thermal or hydro-metallurgic cycles to separate plastic components [R4]; decanting, filtration and/or concentration of sulfuric acid [R5].

1.4.4 *Caratteristiche delle materie prime e/o dei prodotti ottenuti*: piombo e sue leghe e soluzione diluita di acido solforico nelle forme usualmente commercializzate.

1.4.4 *Characteristics of the obtained raw materials and/or products*: lead and its alloys and sulfuric acid diluted solution, as usually put on the market.

Substance	CAS No.	Concentration Limit
Tetrabromodiphenyl ether C 12 H 6 Br 4 O		
Pentabromodiphenyl ether C 12 H 5 Br 5 O		
Hexabromodiphenyl ether C 12 H 4 Br 6 O		
Heptabromodiphenyl ether C 12 H 3 Br 7 O		
Perfluorooctane sulfonic acid and its derivatives (PFOS) C 8 F 17 SO 2 X (X = OH, Metal salt (O-M +), halide, amide, and other derivatives including polymers)		
Polychlorinated dibenzo-p- dioxins and dibenzofurans (PCDD/PCDF)		15 µg/kg (1)
DDT (1,1,1-trichloro-2,2-bis (4-chlorophenyl) ethane)	50-29-3	50 mg/kg
Chlordane	57-74-9	50 mg/kg
Hexachlorocyclohexanes, including lindane	58-89-9 319-84-6 319-85-7 608-73-1	50 mg/kg
Dieldrin	60-57-1	50 mg/kg
Endrin	72-20-8	50 mg/kg
Heptachlor	76-44-8	50 mg/kg
Hexachlorobenzene	118-74-1	50 mg/kg
Chlordecone	143-50-0	50 mg/kg
Aldrin	309-00-2	50 mg/kg
Pentachlorobenzene	608-93-5	50 mg/kg
Polychlorinated Biphenyls (PCB)	1336-36-3 and others	50 mg/kg
Mirex	2385-85-5	50 mg/kg
Toxaphene	8001-35-2	50 mg/kg
Hexabromobiphenyl	36355-01-8	50 mg/kg

Notes:

(1) The limit is calculated as PCDD and PCDF according to the following toxic equivalency factors (TEFs)

PCDD	TEF
2,3,7,8-TeCDD	1
1,2,3,7,8-PeCDD	1
1,2,3,4,7,8-HxCDD	0.1
1,2,3,6,7,8-HxCDD	0.1
1,2,3,7,8,9-HxCDD	0.1
1,2,3,4,6,7,8-HpCDD	0.01
OCDD	0.0003
PCDF	TEF
2,3,7,8-TeCDF	0.1
1,2,3,7,8-PeCDF	0.03
2,3,4,7,8-PeCDF	0.3
1,2,3,4,7,8-HxCDF	0.1
PCDD	TEF
1,2,3,6,7,8-HxCDF	0.1
1,2,3,7,8,9-HxCDF	0.1
2,3,4,6,7,8-HxCDF	0.1
1,2,3,4,6,7,8-HpCDF	0.01
1,2,3,4,7,8,9-HpCDF	0.01
OCDF	0.0003

(2) Where applicable, the calculation method in European standards EN 12766-1 and EN 12766-2 shall be applied.

APC1. APPENDIX C

DETERMINATION OF WORST CASE DISCHARGE PLANNING VOLUME

APC1.1. This appendix provides criteria to determine, on an installation-specific basis, the extent of a worst-case discharge (WCD).

APC1.2. This Appendix provides criteria to determine the volume of oil or hazardous substance to be used in planning for a WCD. Installations should calculate both WCD volumes that apply to the installation's design and operation and use the larger volume as the WCD planning volume.

APC1.3. For installations transferring oil to and from vessels with tank capacities of $\geq 10,500$ gallons (250 barrels), the WCD planning volume is calculated as follows:

APC1.3.1. Where applicable, the loss of the entire capacity of all in-line and break out tank(s) needed for the continuous operation of the pipelines used for the purposes of handling or transporting oil, in bulk, to or from a vessel regardless of the presence of secondary containment; plus

APC1.3.2. The discharge from all piping carrying oil between the marine transfer manifold and the valve or manifold adjacent to the POL storage container. The discharge from each pipe is calculated as follows: The maximum time to discover the release from the pipe in hours, plus the maximum time to shut down flow from the pipe in hours (based on historic discharge data or the best estimate in the absence of historic discharge data for the installation) multiplied by the maximum flow rate expressed in gallons per hour (based on the maximum relief valve setting or maximum system pressure when relief valves are not provided) plus the total line drainage volume expressed in gallons for the pipe between the marine transfer manifold and the valve or manifold adjacent to the POL storage container.

APC1.4. For installations with POL Storage Containers:

APC1.4.1. Single POL Storage Container Facilities. For facilities containing only one aboveground oil or hazardous substance storage container, the WCD planning volume equals the capacity of the oil or hazardous substance storage container. If adequate secondary containment (sufficiently large to contain the capacity of the above ground oil or hazardous substance storage container plus sufficient freeboard to allow for precipitation) exists for the oil storage container, multiply the capacity of the container by 0.8.

APC1.4.2. Multiple POL Storage Container Facilities

APC1.4.2.1. Facilities having no secondary containment. If none of the above ground storage containers 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.

APC1.4.2.2. Facilities having complete secondary containment. If every above ground storage container at the facility has adequate secondary containment, the WCD planning volume

ITALY - APPENDIX C Determination of Worst Case Discharge Planning Volume

equals the capacity of the largest single above ground oil or hazardous substance storage container.

APC1.4.2.3. Facilities having partial secondary containment. If some, but not all above ground storage containers at the facility have adequate secondary containment, the WCD planning volume equals the sum of:

APC1.4.2.3.1. The total capacity of the above ground oil and hazardous substance storage container that lacks adequate secondary containment; plus

APC1.4.2.3.2. The capacity of the largest single above ground oil or hazardous substance storage container that has adequate secondary containment.

APC1.4.3. 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.

To obtain a copy of this Addendum, please contact the DoD LEC.

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European List of Wastes**Introduction**

The different types of wastes in the list are fully defined by the six-digit code for the waste and the respective two-digit and four-digit chapter headings. This implies that the following steps should be taken to identify a waste in the list:

1. Identify the source generating the waste in chapters 01 to 12 or 17 to 20 and identify the appropriate six-digit code of the waste (excluding codes ending with 99 of these chapters).
2. Separately collected packaging waste (including mixtures of different packaging materials) shall be classified in 15 01, not in 20 01.
3. If no appropriate waste code can be found in chapters 01 to 12 or 17 to 20, the chapters 13, 14 and 15 must be examined to identify the waste.
4. If none of these waste codes apply, the waste must be identified according to chapter 16.
5. If the waste is not in chapter 16 either, the 99 code (wastes not otherwise specified) must be used in the section of the list corresponding to the activity identified in step 1.

Index**Chapters of the list**

- | | |
|----|---|
| 01 | Wastes resulting from exploration, mining, quarrying, physical and chemical treatment of minerals |
| 02 | Wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing, food preparation and processing |
| 03 | Wastes from wood processing and the production of panels and furniture, pulp, paper and cardboard |
| 04 | Wastes from the leather, fur and textile industries |
| 05 | Wastes from petroleum refining, natural gas purification and pyrolytic treatment of coal |
| 06 | Wastes from inorganic chemical processes |
| 07 | Wastes from organic chemical processes |
| 08 | Wastes from the manufacture, formulation, supply and use (MFSU) of coatings (paints, varnishes and vitreous enamels), adhesives, sealants and printing inks |
| 09 | Wastes from the photographic industry |
| 10 | Wastes from thermal processes |

- 11 Wastes from chemical surface treatment and coating of metals and other materials; non-ferrous hydro-metallurgy
- 12 Wastes from shaping and physical and mechanical surface treatment of metals and plastics
- 13 Oil wastes and wastes of liquid fuels (except edible oils, 05 and 12)
- 14 Waste organic solvents, refrigerants and propellants (except 07 and 08)
- 15 Waste packaging; absorbents, wiping cloths, filter materials and protective clothing not otherwise specified
- 16 Wastes not otherwise specified in the list
- 17 Construction and demolition wastes (including excavated soil from contaminated sites)
- 18 Wastes from human or animal health care and/or related research (except kitchen and restaurant wastes not arising from immediate health care)
- 19 Wastes from waste management facilities, off-site waste water treatment plants and the preparation of water intended for human consumption and water for industrial use
- 20 Municipal wastes (household waste and similar commercial, industrial and institutional wastes) including separately collected fractions

List of Wastes

- 01 WASTES RESULTING FROM EXPLORATION, MINING, QUARRYING, AND PHYSICAL AND CHEMICAL TREATMENT OF MINERALS**
- 01 01 wastes from mineral excavation**
- 01 01 01 wastes from mineral metalliferous excavation
- 01 01 02 wastes from mineral non-metalliferous excavation
- 01 03 wastes from physical and chemical processing of metalliferous minerals**
- 01 03 04* acid-generating tailings from processing of sulfide ore**
- 01 03 05* other tailings containing dangerous substances**
- 01 03 06 tailings other than those mentioned in 01 03 04 and 01 03 05
- 01 03 07* other wastes containing dangerous substances from physical and chemical processing of metalliferous minerals**
- 01 03 08 dusty and powdery wastes other than those mentioned in 01 03 07
- 01 03 09 red mud from alumina production other than the wastes mentioned in 01 03 07

01 03 99	wastes not otherwise specified
01 04	wastes from physical and chemical processing of non-metalliferous minerals
01 04 07*	<i>wastes containing dangerous substances from physical and chemical processing of non-metalliferous minerals</i>
01 04 08	waste gravel and crushed rocks other than those mentioned in 01 04 07
01 04 09	waste sand and clays
01 04 10	dusty and powdery wastes other than those mentioned in 01 04 07
01 04 11	wastes from potash and rock salt processing other than those mentioned in 01 04 07
01 04 12	tailings and other wastes from washing and cleaning of minerals other than those mentioned in 01 04 07 and 01 04 11
01 04 13	wastes from stone cutting and sawing other than those mentioned in 01 04 07
01 04 99	wastes not otherwise specified
01 05	drilling muds and other drilling wastes
01 05 04	freshwater drilling muds and wastes
01 05 05*	<i>oil-containing drilling muds and wastes</i>
01 05 06*	<i>drilling muds and other drilling wastes containing dangerous substances</i>
01 05 07	barite-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 08	chloride-containing drilling muds and wastes other than those mentioned in 01 05 05 and 01 05 06
01 05 99	wastes not otherwise specified
02	WASTES FROM AGRICULTURE, HORTICULTURE, AQUACULTURE, FORESTRY, HUNTING AND FISHING, FOOD PREPARATION AND PROCESSING
02 01	wastes from agriculture, horticulture, aquaculture, forestry, hunting and fishing
02 01 01	sludges from washing and cleaning
02 01 02	animal-tissue waste
02 01 03	plant-tissue waste

02 01 04	waste plastics (except packaging)
02 01 06	animal feces, urine and manure (including spoiled straw), effluent, collected separately and treated off-site
02 01 07	wastes from forestry
02 01 08*	<i>agrochemical waste containing dangerous substances</i>
02 01 09	agrochemical waste other than those mentioned in 02 01 08
02 01 10	waste metal
02 01 99	wastes not otherwise specified
02 02	wastes from the preparation and processing of meat, fish and other foods of animal origin
02 02 01	sludges from washing and cleaning
02 02 02	animal-tissue waste
02 02 03	materials unsuitable for consumption or processing
02 02 04	sludges from on-site effluent treatment
02 02 99	wastes not otherwise specified
02 03	wastes from fruit, vegetables, cereals, edible oils, cocoa, coffee, tea and tobacco preparation and processing; conserve production; yeast and yeast extract production, molasses preparation and fermentation
02 03 01	sludges from washing, cleaning, peeling, centrifuging and separation
02 03 02	wastes from preserving agents
02 03 03	wastes from solvent extraction
02 03 04	materials unsuitable for consumption or processing
02 03 05	sludges from on-site effluent treatment
02 03 99	wastes not otherwise specified
02 04	wastes from sugar processing
02 04 01	soil from cleaning and washing beet
02 04 02	off-specification calcium carbonate
02 04 03	sludges from on-site effluent treatment
02 04 99	wastes not otherwise specified

02 05 wastes from the dairy products industry

02 05 01 materials unsuitable for consumption or processing

02 05 02 sludges from on-site effluent treatment

02 05 99 wastes not otherwise specified

02 06 wastes from the baking and confectionery industry

02 06 01 materials unsuitable for consumption or processing

02 06 02 wastes from preserving agents

02 06 03 sludges from on-site effluent treatment

02 06 99 wastes not otherwise specified

02 07 wastes from the production of alcoholic and non-alcoholic beverages (except coffee, tea and cocoa)

02 07 01 wastes from washing, cleaning and mechanical reduction of raw materials

02 07 02 wastes from spirits distillation

02 07 03 wastes from chemical treatment

02 07 04 materials unsuitable for consumption or processing

02 07 05 sludges from on-site effluent treatment

02 07 99 wastes not otherwise specified

03 WASTES FROM WOOD PROCESSING AND THE PRODUCTION OF PANELS AND FURNITURE, PULP, PAPER AND CARDBOARD

03 01 wastes from wood processing and the production of panels and furniture

03 01 01 waste bark and cork

03 01 04* *sawdust, shavings, cuttings, wood, particle board and veneer containing dangerous substances*

03 01 05 sawdust, shavings, cuttings, wood, particle board and veneer other than those mentioned in 03 01 04

03 01 99 wastes not otherwise specified

03 02 wastes from wood preservation

03 02 01* *non-halogenated organic wood preservatives*

03 02 02* *organochlorinated wood preservatives*

03 02 03*	<i>organometallic wood preservatives</i>
03 02 04*	<i>inorganic wood preservatives</i>
03 02 05*	<i>other wood preservatives containing dangerous substances</i>
03 02 99	wood preservatives not otherwise specified
03 03	wastes from pulp, paper and cardboard production and processing
03 03 01	waste bark and wood
03 03 02	green liquor sludge (from recovery of cooking liquor)
03 03 05	de-inking sludges from paper recycling
03 03 07	mechanically separated rejects from pulping of waste paper and cardboard
03 03 08	wastes from sorting of paper and cardboard destined for recycling
03 03 09	lime mud waste
03 03 10	fiber rejects, fiber-, filler- and coating-sludges from mechanical separation
03 03 11	sludges from on-site effluent treatment other than those mentioned in 03 03 10
03 03 99	wastes not otherwise specified
04	WASTES FROM THE LEATHER, FUR AND TEXTILE INDUSTRIES
04 01	wastes from the leather and fur industry
04 01 01	fleshings and lime split wastes
04 01 02	liming waste
04 01 03*	<i>degreasing wastes containing solvents without a liquid phase</i>
04 01 04	tanning liquor containing chromium
04 01 05	tanning liquor free of chromium
04 01 06	sludges, in particular from on-site effluent treatment containing chromium
04 01 07	sludges, in particular from on-site effluent treatment free of chromium
04 01 08	waste tanned leather (blue sheetings, shavings, cuttings, buffing dust) containing chromium
04 01 09	wastes from dressing and finishing
04 01 99	wastes not otherwise specified
04 02	wastes from the textile industry

04 02 09	wastes from composite materials (impregnated textile, elastomer, plastomer)
04 02 10	organic matter from natural products (for example grease, wax)
04 02 14*	<i>wastes from finishing containing organic solvents</i>
04 02 15	wastes from finishing other than those mentioned in 04 02 14
04 02 16*	<i>dyestuffs and pigments containing dangerous substances</i>
04 02 17	dyestuffs and pigments other than those mentioned in 04 02 16
04 02 19*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
04 02 20	sludges from on-site effluent treatment other than those mentioned in 04 02 19
04 02 21	wastes from unprocessed textile fibers
04 02 22	wastes from processed textile fibers
04 02 99	wastes not otherwise specified
05	WASTES FROM PETROLEUM REFINING, NATURAL GAS PURIFICATION AND PYROLYTIC TREATMENT OF COAL
05 01	wastes from petroleum refining
05 01 02*	<i>desalter sludges</i>
05 01 03*	<i>tank bottom sludges</i>
05 01 04*	<i>acid alkyl sludges</i>
05 01 05*	<i>oil spills</i>
05 01 06*	<i>oily sludges from maintenance operations of the plant or equipment</i>
05 01 07*	<i>acid tars</i>
05 01 08*	<i>other tars</i>
05 01 09*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
05 01 10	sludges from on-site effluent treatment other than those mentioned in 05 01 09
05 01 11*	<i>wastes from cleaning of fuels with bases</i>
05 01 12*	<i>oil containing acids</i>
05 01 13	boiler feedwater sludges
05 01 14	wastes from cooling columns
05 01 15*	<i>spent filter clays</i>

05 01 16	sulfur-containing wastes from petroleum desulfurization
05 01 17	bitumen
05 01 99	wastes not otherwise specified
05 06	wastes from the pyrolytic treatment of coal
05 06 01*	<i>acid tars</i>
05 06 03*	<i>other tars</i>
05 06 04	waste from cooling columns
05 06 99	wastes not otherwise specified
05 07	wastes from natural gas purification and transportation
05 07 01*	<i>wastes containing mercury</i>
05 07 02	wastes containing sulfur
05 07 99	wastes not otherwise specified
06	WASTES FROM INORGANIC CHEMICAL PROCESSES
06 01	wastes from the manufacture, formulation, supply and use (MFSU) of acids
06 01 01*	<i>sulfuric acid and sulfurous acid</i>
06 01 02*	<i>hydrochloric acid</i>
06 01 03*	<i>hydrofluoric acid</i>
06 01 04*	<i>phosphoric and phosphorous acid</i>
06 01 05*	<i>nitric acid and nitrous acid</i>
06 01 06*	<i>other acids</i>
06 01 99	wastes not otherwise specified
06 02	wastes from the MFSU of bases
06 02 01*	<i>calcium hydroxide</i>
06 02 03*	<i>ammonium hydroxide</i>
06 02 04*	<i>sodium and potassium hydroxide</i>
06 02 05*	<i>other bases</i>
06 02 99	wastes not otherwise specified

06 03	wastes from the MFSU of salts and their solutions and metallic oxides
06 03 11*	<i>solid salts and solutions containing cyanides</i>
06 03 13*	<i>solid salts and solutions containing heavy metals</i>
06 03 14	solid salts and solutions other than those mentioned in 06 03 11 and 06 03 13
06 03 15*	<i>metallic oxides containing heavy metals</i>
06 03 16	metallic oxides other than those mentioned in 06 03 15
06 03 99	wastes not otherwise specified
06 04	metal-containing wastes other than those mentioned in 06 03
06 04 03*	<i>wastes containing arsenic</i>
06 04 04*	<i>wastes containing mercury</i>
06 04 05*	<i>wastes containing other heavy metals</i>
06 04 99	wastes not otherwise specified
06 05	sludges from on-site effluent treatment
06 05 02*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
06 05 03	sludges from on-site effluent treatment other than those mentioned in 06 05 02
06 06	wastes from the MFSU of sulfur chemicals, sulfur chemical processes and desulfurization processes
06 06 02*	<i>wastes containing dangerous sulfides</i>
06 06 03	wastes containing sulfides other than those mentioned in 06 06 02
06 06 99	wastes not otherwise specified
06 07	wastes from the MFSU of halogens and halogen chemical processes
06 07 01*	<i>wastes containing asbestos from electrolysis</i>
06 07 02*	<i>activated carbon from chlorine production</i>
06 07 03*	<i>barium sulfate sludge containing mercury</i>
06 07 04*	<i>solutions and acids, for example contact acid</i>
06 07 99	wastes not otherwise specified
06 08	wastes from the MFSU of silicon and silicon derivatives
06 08 02*	<i>waste containing dangerous silicones</i>

06 08 99	wastes not otherwise specified
06 09	wastes from the MSFU of phosphorous chemicals and phosphorous chemical processes
06 09 02	phosphorous slag
06 09 03*	<i>calcium-based reaction wastes containing or contaminated with dangerous substances</i>
06 09 04	calcium-based reaction wastes other than those mentioned in 06 09 03
06 09 99	wastes not otherwise specified
06 10	wastes from the MFSU of nitrogen chemicals, nitrogen chemical processes and fertilizer manufacture
06 10 02*	<i>wastes containing dangerous substances</i>
06 10 99	wastes not otherwise specified
06 11	wastes from the manufacture of inorganic pigments and opacifiers
06 11 01	calcium-based reaction wastes from titanium dioxide production
06 11 99	wastes not otherwise specified
06 13	wastes from inorganic chemical processes not otherwise specified
06 13 01*	<i>inorganic plant protection products, wood-preserving agents and other biocides</i>
06 13 02*	<i>spent activated carbon (except 06 07 02)</i>
06 13 03	carbon black
06 13 04*	<i>wastes from asbestos processing</i>
06 13 05*	<i>soot</i>
06 13 99	wastes not otherwise specified
07	WASTES FROM ORGANIC CHEMICAL PROCESSES
07 01	wastes from the manufacture, formulation, supply and use (MFSU) of basic organic chemicals
07 01 01*	<i>aqueous washing liquids and mother liquors</i>
07 01 03*	<i>organic halogenated solvents, washing liquids and mother liquors</i>
07 01 04*	<i>other organic solvents, washing liquids and mother liquors</i>
07 01 07*	<i>halogenated still bottoms and reaction residues</i>

- 07 01 08*** *other still bottoms and reaction residues*
- 07 01 09*** *halogenated filter cakes and spent absorbents*
- 07 01 10*** *other filter cakes and spent absorbents*
- 07 01 11*** *sludges from on-site effluent treatment containing dangerous substances*
- 07 01 12 sludges from on-site effluent treatment other than those mentioned in 07 01 11
- 07 01 99 wastes not otherwise specified
- 07 02** **wastes from the MFSU of plastics, synthetic rubber and man-made fibers**
- 07 02 01*** *aqueous washing liquids and mother liquors*
- 07 02 03*** *organic halogenated solvents, washing liquids and mother liquors*
- 07 02 04*** *other organic solvents, washing liquids and mother liquors*
- 07 02 07*** *halogenated still bottoms and reaction residues*
- 07 02 08*** *other still bottoms and reaction residues*
- 07 02 09*** *halogenated filter cakes and spent absorbents*
- 07 02 10*** *other filter cakes and spent absorbents*
- 07 02 11*** *sludges from on-site effluent treatment containing dangerous substances*
- 07 02 12 sludges from on-site effluent treatment other than those mentioned in 07 02 11
- 07 02 13 waste plastic
- 07 02 14*** *wastes from additives containing dangerous substances*
- 07 02 15 wastes from additives other than those mentioned in 07 02 14
- 07 02 16*** *waste containing dangerous silicones*
- 07 02 17 waste containing silicones other than those mentioned in 07 02 16
- 07 02 99 wastes not otherwise specified
- 07 03** **wastes from the MFSU of organic dyes and pigments (except 06 11)**
- 07 03 01*** *aqueous washing liquids and mother liquors*
- 07 03 03*** *organic halogenated solvents, washing liquids and mother liquors*
- 07 03 04*** *other organic solvents, washing liquids and mother liquors*
- 07 03 07*** *halogenated still bottoms and reaction residues*

- 07 03 08*** *other still bottoms and reaction residues*
- 07 03 09*** *halogenated filter cakes and spent absorbents*
- 07 03 10*** *other filter cakes and spent absorbents*
- 07 03 11*** *sludges from on-site effluent treatment containing dangerous substances*
- 07 03 12 sludges from on-site effluent treatment other than those mentioned in 07 03 11
- 07 03 99 wastes not otherwise specified
- 07 04** **wastes from the MFSU of organic plant protection products (except 02 01 08 and 02 01 09), wood preserving agents (except 03 02) and other biocides**
- 07 04 01*** *aqueous washing liquids and mother liquors*
- 07 04 03*** *organic halogenated solvents, washing liquids and mother liquors*
- 07 04 04*** *other organic solvents, washing liquids and mother liquors*
- 07 04 07*** *halogenated still bottoms and reaction residues*
- 07 04 08*** *other still bottoms and reaction residues*
- 07 04 09*** *halogenated filter cakes and spent absorbents*
- 07 04 10*** *other filter cakes and spent absorbents*
- 07 04 11*** *sludges from on-site effluent treatment containing dangerous substances*
- 07 04 12 sludges from on-site effluent treatment other than those mentioned in 07 04 11
- 07 04 13*** *solid wastes containing dangerous substances*
- 07 04 99 wastes not otherwise specified
- 07 05** **wastes from the MFSU of pharmaceuticals**
- 07 05 01*** *aqueous washing liquids and mother liquors*
- 07 05 03*** *organic halogenated solvents, washing liquids and mother liquors*
- 07 05 04*** *other organic solvents, washing liquids and mother liquors*
- 07 05 07*** *halogenated still bottoms and reaction residues*
- 07 05 08*** *other still bottoms and reaction residues*
- 07 05 09*** *halogenated filter cakes and spent absorbents*
- 07 05 10*** *other filter cakes and spent absorbents*
- 07 05 11*** *sludges from on-site effluent treatment containing dangerous substances*

07 05 12	sludges from on-site effluent treatment other than those mentioned in 07 05 11
07 05 13*	<i>solid wastes containing dangerous substances</i>
07 05 14	solid wastes other than those mentioned in 07 05 13
07 05 99	wastes not otherwise specified
07 06	wastes from the MFSU of fats, grease, soaps, detergents, disinfectants and cosmetics
07 06 01*	<i>aqueous washing liquids and mother liquors</i>
07 06 03*	<i>organic halogenated solvents, washing liquids and mother liquors</i>
07 06 04*	<i>other organic solvents, washing liquids and mother liquors</i>
07 06 07*	<i>halogenated still bottoms and reaction residues</i>
07 06 08*	<i>other still bottoms and reaction residues</i>
07 06 09*	<i>halogenated filter cakes and spent absorbents</i>
07 06 10*	<i>other filter cakes and spent absorbents</i>
07 06 11*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
07 06 12	sludges from on-site effluent treatment other than those mentioned in 07 06 11
07 06 99	wastes not otherwise specified
07 07	wastes from the MFSU of fine chemicals and chemical products not otherwise specified
07 07 01*	<i>aqueous washing liquids and mother liquors</i>
07 07 03*	<i>organic halogenated solvents, washing liquids and mother liquors</i>
07 07 04*	<i>other organic solvents, washing liquids and mother liquors</i>
07 07 07*	<i>halogenated still bottoms and reaction residues</i>
07 07 08*	<i>other still bottoms and reaction residues</i>
07 07 09*	<i>halogenated filter cakes and spent absorbents</i>
07 07 10*	<i>other filter cakes and spent absorbents</i>
07 07 11*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
07 07 12	sludges from on-site effluent treatment other than those mentioned in 07 07 11
07 07 13	wastes not otherwise specified

08	WASTES FROM THE MANUFACTURE, FORMULATION, SUPPLY AND USE (MFSU) OF COATINGS (PAINTS, VARNISHES AND VITREOUS ENAMELS), ADHESIVES, SEALANTS AND PRINTING INKS
08 01	wastes from MFSU and removal of paint and varnish
08 01 11*	<i>waste paint and varnish containing organic solvents or other dangerous substances</i>
08 01 12	waste paint and varnish other than those mentioned in 08 01 11
08 01 13*	<i>sludges from paint or varnish containing organic solvents or other dangerous substances</i>
08 01 14	sludges from paint or varnish other than those mentioned in 08 01 13
08 01 15*	<i>aqueous sludges containing paint or varnish containing organic solvents or other dangerous substances</i>
08 01 16	aqueous sludges containing paint or varnish other than those mentioned in 08 01 15
08 01 17*	<i>wastes from paint or varnish removal containing organic solvents or other dangerous substances</i>
08 01 18	wastes from paint or varnish removal other than those mentioned in 08 01 17
08 01 19*	<i>aqueous suspensions containing paint or varnish containing organic solvents or other dangerous substances</i>
08 01 20	aqueous suspensions containing paint or varnish other than those mentioned in 08 01 19
08 01 21*	<i>waste paint or varnish remover</i>
08 01 99	wastes not otherwise specified
08 02	wastes from MFSU of other coatings (including ceramic materials)
08 02 01	waste coating powders
08 02 02	aqueous sludges containing ceramic materials
08 02 03	aqueous suspensions containing ceramic materials
08 02 99	wastes not otherwise specified
08 03	wastes from MFSU of printing inks
08 03 07	aqueous sludges containing ink
08 03 08	aqueous liquid waste containing ink
08 03 12*	<i>waste ink containing dangerous substances</i>

08 03 13	waste ink other than those mentioned in 08 03 12
08 03 14*	<i>ink sludges containing dangerous substances</i>
08 03 15	ink sludges other than those mentioned in 08 03 14
08 03 16*	<i>waste etching solutions</i>
08 03 17*	<i>waste printing toner containing dangerous substances</i>
08 03 18	waste printing toner other than those mentioned in 08 03 17
08 03 19*	<i>disperse oil</i>
08 03 99	wastes not otherwise specified
08 04	wastes from MFSU of adhesives and sealants (including waterproofing products)
08 04 09*	<i>waste adhesives and sealants containing organic solvents or other dangerous substances</i>
08 04 10	waste adhesives and sealants other than those mentioned in 08 04 09
08 04 11*	<i>adhesive and sealant sludges containing organic solvents or other dangerous substances</i>
08 04 12	adhesive and sealant sludges other than those mentioned in 08 04 11
08 04 13*	<i>aqueous sludges containing adhesives or sealants containing organic solvents or other dangerous substances</i>
08 04 14	aqueous sludges containing adhesives or sealants other than those mentioned in 08 04 13
08 04 15*	<i>aqueous liquid waste containing adhesives or sealants containing organic solvents or other dangerous substances</i>
08 04 16	aqueous liquid waste containing adhesives or sealants other than those mentioned in 08 04 15
08 04 17*	<i>rosin oil</i>
08 04 99	wastes not otherwise specified
08 05	wastes not otherwise specified in 08
08 05 01*	<i>waste isocyanates</i>
09	WASTES FROM THE PHOTOGRAPHIC INDUSTRY
09 01	wastes from the photographic industry

- 09 01 01*** *water-based developer and activator solutions*
- 09 01 02*** *water-based offset plate developer solutions*
- 09 01 03*** *solvent-based developer solutions*
- 09 01 04*** *fixer solutions*
- 09 01 05*** *bleach solutions and bleach fixer solutions*
- 09 01 06*** *wastes containing silver from on-site treatment of photographic wastes*
- 09 01 07 photographic film and paper containing silver or silver compounds
- 09 01 08 photographic film and paper free of silver or silver compounds
- 09 01 10 single-use cameras without batteries
- 09 01 11*** *single-use cameras containing batteries included in 16 06 01, 16 06 02 or 16 06 03*
- 09 01 12 single-use cameras containing batteries other than those mentioned in 09 01 11
- 09 01 13*** *aqueous liquid waste from on-site reclamation of silver other than those mentioned in 09 01 06*
- 09 01 99 wastes not otherwise specified
- 10 WASTES FROM THERMAL PROCESSES**
- 10 01 wastes from power stations and other combustion plants (except 19)**
- 10 01 01 bottom ash, slag and boiler dust (excluding boiler dust mentioned in 10 01 04)
- 10 01 02 coal fly ash
- 10 01 03 fly ash from peat and untreated wood
- 10 01 04*** *oil fly ash and boiler dust*
- 10 01 05 calcium-based reaction wastes from flue-gas desulfurization in solid form
- 10 01 07 calcium-based reaction wastes from flue-gas desulfurization in sludge form
- 10 01 09*** *sulfuric acid*
- 10 01 13*** *fly ash from emulsified hydrocarbons used as fuel*
- 10 01 14*** *bottom ash, slag and boiler dust from co-incineration containing dangerous substances*
- 10 01 15 bottom ash, slag and boiler dust from co-incineration other than those mentioned in 10 01 14

- 10 01 16*** *fly ash from co-incineration containing dangerous substances*
- 10 01 17 fly ash from co-incineration other than those mentioned in 10 01 16
- 10 01 18*** *wastes from gas cleaning containing dangerous substances*
- 10 01 19 wastes from gas cleaning other than those mentioned in 10 01 05, 10 01 07 and 10 01 18
- 10 01 20*** *sludges from on-site effluent treatment containing dangerous substances*
- 10 01 21 sludges from on-site effluent treatment other than those mentioned in 10 01 20
- 10 01 22*** *aqueous sludges from boiler cleansing containing dangerous substances*
- 10 01 23 aqueous sludges from boiler cleansing other than those mentioned in 10 01 22
- 10 01 24 sands from fluidized beds
- 10 01 25 wastes from fuel storage and preparation of coal-fired power plants
- 10 01 26 wastes from cooling-water treatment
- 10 01 99 wastes not otherwise specified
- 10 02 wastes from the iron and steel industry**
- 10 02 01 wastes from the processing of slag
- 10 02 02 unprocessed slag
- 10 02 07*** *solid wastes from gas treatment containing dangerous substances*
- 10 02 08 solid wastes from gas treatment other than those mentioned in 10 02 07
- 10 02 10 mill scales
- 10 02 11*** *wastes from cooling-water treatment containing oil*
- 10 02 12 wastes from cooling-water treatment other than those mentioned in 10 02 11
- 10 02 13*** *sludges and filter cakes from gas treatment containing dangerous substances*
- 10 02 14 sludges and filter cakes from gas treatment other than those mentioned in 10 02 13
- 10 02 15 other sludges and filter cakes
- 10 02 99 wastes not otherwise specified
- 10 03 wastes from aluminum thermal metallurgy**
- 10 03 02 anode scraps
- 10 03 04*** *primary production slags*

10 03 05	waste alumina
10 03 08*	<i>salt slags from secondary production</i>
10 03 09*	<i>black drosses from secondary production</i>
10 03 15*	<i>skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities</i>
10 03 16	skimmings other than those mentioned in 10 03 15
10 03 17*	<i>tar-containing wastes from anode manufacture</i>
10 03 18	carbon-containing wastes from anode manufacture other than those mentioned in 10 03 17
10 03 19*	<i>flue-gas dust containing dangerous substances</i>
10 03 20	flue-gas dust other than those mentioned in 10 03 19
10 03 21*	<i>other particulates and dust (including ball-mill dust) containing dangerous substances</i>
10 03 22	other particulates and dust (including ball-mill dust) other than those mentioned in 10 03 21
10 03 23*	<i>solid wastes from gas treatment containing dangerous substances</i>
10 03 24	solid wastes from gas treatment other than those mentioned in 10 03 23
10 03 25*	<i>sludges and filter cakes from gas treatment containing dangerous substances</i>
10 03 26	sludges and filter cakes from gas treatment other than those mentioned in 10 03 25
10 03 27*	<i>wastes from cooling-water treatment containing oil</i>
10 03 28	wastes from cooling-water treatment other than those mentioned in 10 03 27
10 03 29*	<i>wastes from treatment of salt slags and black drosses containing dangerous substances</i>
10 03 30	wastes from treatment of salt slags and black drosses other than those mentioned in 10 03 29
10 03 99	wastes not otherwise specified
10 04	wastes from lead thermal metallurgy
10 04 01*	<i>slags from primary and secondary production</i>
10 04 02*	<i>dross and skimmings from primary and secondary production</i>
10 04 03*	<i>calcium arsenate</i>

- 10 04 04*** *flue-gas dust*
- 10 04 05*** *other particulates and dust*
- 10 04 06*** *solid wastes from gas treatment*
- 10 04 07*** *sludges and filter cakes from gas treatment*
- 10 04 09*** *wastes from cooling-water treatment containing oil*
- 10 04 10 wastes from cooling-water treatment other than those mentioned in 10 04 09
- 10 04 99 wastes not otherwise specified
- 10 05 wastes from zinc thermal metallurgy**
- 10 05 01 slags from primary and secondary production
- 10 05 03*** *flue-gas dust*
- 10 05 04 other particulates and dust
- 10 05 05*** *solid waste from gas treatment*
- 10 05 06*** *sludges and filter cakes from gas treatment*
- 10 05 08*** *wastes from cooling-water treatment containing oil*
- 10 05 09 wastes from cooling-water treatment other than those mentioned in 10 05 08
- 10 05 10*** *dross and skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities*
- 10 05 11 dross and skimmings other than those mentioned in 10 05 10
- 10 05 99 wastes not otherwise specified
- 10 06 wastes from copper thermal metallurgy**
- 10 06 01 slags from primary and secondary production
- 10 06 02 dross and skimmings from primary and secondary production
- 10 06 03*** *flue-gas dust*
- 10 06 04 other particulates and dust
- 10 06 06*** *solid wastes from gas treatment*
- 10 06 07*** *sludges and filter cakes from gas treatment*
- 10 06 09*** *wastes from cooling-water treatment containing oil*
- 10 06 10 wastes from cooling-water treatment other than those mentioned in 10 06 09

10 06 99	wastes not otherwise specified
10 07	wastes from silver, gold and platinum thermal metallurgy
10 07 01	slags from primary and secondary production
10 07 02	dross and skimmings from primary and secondary production
10 07 03	solid wastes from gas treatment
10 07 04	other particulates and dust
10 07 05	sludges and filter cakes from gas treatment
10 07 07*	<i>wastes from cooling-water treatment containing oil</i>
10 07 08	wastes from cooling-water treatment other than those mentioned in 10 07 07
10 07 99	wastes not otherwise specified
10 08	wastes from other non-ferrous thermal metallurgy
10 08 04	particulates and dust
10 08 08*	<i>salt slag from primary and secondary production</i>
10 08 09	other slags
10 08 10*	<i>dross and skimmings that are flammable or emit, upon contact with water, flammable gases in dangerous quantities</i>
10 08 11	dross and skimmings other than those mentioned in 10 08 10
10 08 12*	<i>tar-containing wastes from anode manufacture</i>
10 08 13	carbon-containing wastes from anode manufacture other than those mentioned in 10 08 12
10 08 14	anode scrap
10 08 15*	<i>flue-gas dust containing dangerous substances</i>
10 08 16	flue-gas dust other than those mentioned in 10 08 15
10 08 17*	<i>sludges and filter cakes from flue-gas treatment containing dangerous substances</i>
10 08 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 08 17
10 08 19*	<i>wastes from cooling-water treatment containing oil</i>
10 08 20	wastes from cooling-water treatment other than those mentioned in 10 08 19

10 08 99	wastes not otherwise specified
10 09	wastes from casting of ferrous pieces
10 09 03	furnace slag
10 09 05*	<i>casting cores and molds which have not undergone pouring containing dangerous substances</i>
10 09 06	casting cores and molds which have not undergone pouring other than those mentioned in 10 09 05
10 09 07*	<i>casting cores and molds which have undergone pouring containing dangerous substances</i>
10 09 08	casting cores and molds which have undergone pouring other than those mentioned in 10 09 07
10 09 09*	<i>flue-gas dust containing dangerous substances</i>
10 09 10	flue-gas dust other than those mentioned in 10 09 09
10 09 11*	<i>other particulates containing dangerous substances</i>
10 09 12	other particulates other than those mentioned in 10 09 11
10 09 13*	<i>waste binders containing dangerous substances</i>
10 09 14	waste binders other than those mentioned in 10 09 13
10 09 15*	<i>waste crack-indicating agent containing dangerous substances</i>
10 09 16	waste crack-indicating agent other than those mentioned in 10 09 15
10 09 99	wastes not otherwise specified
10 10	wastes from casting of non-ferrous pieces
10 10 03	furnace slag
10 10 05*	<i>casting cores and molds which have not undergone pouring, containing dangerous substances</i>
10 10 06	casting cores and molds which have not undergone pouring, other than those mentioned in 10 10 05
10 10 07*	<i>casting cores and molds which have undergone pouring, containing dangerous substances</i>
10 10 08	casting cores and molds which have undergone pouring, other than those mentioned in 10 10 07
10 10 09*	<i>flue-gas dust containing dangerous substances</i>

10 10 10	flue-gas dust other than those mentioned in 10 10 09
10 10 11*	<i>other particulates containing dangerous substances</i>
10 10 12	other particulates other than those mentioned in 10 10 11
10 10 13*	<i>waste binders containing dangerous substances</i>
10 10 14	waste binders other than those mentioned in 10 10 13
10 10 15*	<i>waste crack-indicating agent containing dangerous substances</i>
10 10 16	waste crack-indicating agent other than those mentioned in 10 10 15
10 10 99	wastes not otherwise specified
10 11	wastes from manufacture of glass and glass products
10 11 03	waste glass-based fibrous materials
10 11 05	particulates and dust
10 11 09*	<i>waste preparation mixture before thermal processing, containing dangerous substances</i>
10 11 10	waste preparation mixture before thermal processing, other than those mentioned in 10 11 09
10 11 11*	<i>waste glass in small particles and glass powder containing heavy metals (for example from cathode ray tubes)</i>
10 11 12	waste glass other than those mentioned in 10 11 11
10 11 13*	<i>glass-polishing and -grinding sludge containing dangerous substances</i>
10 11 14	glass-polishing and -grinding sludge other than those mentioned in 10 11 13
10 11 15*	<i>solid wastes from flue-gas treatment containing dangerous substances</i>
10 11 16	solid wastes from flue-gas treatment other than those mentioned in 10 11 15
10 11 17*	<i>sludges and filter cakes from flue-gas treatment containing dangerous substances</i>
10 11 18	sludges and filter cakes from flue-gas treatment other than those mentioned in 10 11 17
10 11 19*	<i>solid wastes from on-site effluent treatment containing dangerous substances</i>
10 11 20	solid wastes from on-site effluent treatment other than those mentioned in 10 11 19
10 11 99	wastes not otherwise specified

10 12	wastes from manufacture of ceramic goods, bricks, tiles and construction products
10 12 01	waste preparation mixture before thermal processing
10 12 03	particulates and dust
10 12 05	sludges and filter cakes from gas treatment
10 12 06	discarded molds
10 12 08	waste ceramics, bricks, tiles and construction products (after thermal processing)
10 12 09*	<i>solid wastes from gas treatment containing dangerous substances</i>
10 12 10	solid wastes from gas treatment other than those mentioned in 10 12 09
10 12 11*	<i>wastes from glazing containing heavy metals</i>
10 12 12	wastes from glazing other than those mentioned in 10 12 11
10 12 13	sludge from on-site effluent treatment
10 12 99	wastes not otherwise specified
10 13	wastes from manufacture of cement, lime and plaster and articles and products made from them
10 13 01	waste preparation mixture before thermal processing
10 13 04	wastes from calcination and hydration of lime
10 13 06	particulates and dust (except 10 13 12 and 10 13 13)
10 13 07	sludges and filter cakes from gas treatment
10 13 09*	<i>wastes from asbestos-cement manufacture containing asbestos</i>
10 13 10	wastes from asbestos-cement manufacture other than those mentioned in 10 13 09
10 13 11	wastes from cement-based composite materials other than those mentioned in 10 13 09 and 10 13 10
10 13 12*	<i>solid wastes from gas treatment containing dangerous substances</i>
10 13 13	solid wastes from gas treatment other than those mentioned in 10 13 12
10 13 14	waste concrete and concrete sludge
10 13 99	wastes not otherwise specified
10 14	waste from crematoria

- 10 14 01*** *waste from gas cleaning containing mercury*
- 11** **WASTES FROM CHEMICAL SURFACE TREATMENT AND COATING OF METALS AND OTHER MATERIALS; NON-FERROUS HYDRO-METALLURGY**
- 11 01** **wastes from chemical surface treatment and coating of metals and other materials (for example galvanic processes, zinc coating processes, pickling processes, etching, phosphating, alkaline degreasing, anodizing)**
- 11 01 05*** *pickling acids*
- 11 01 06*** *acids not otherwise specified*
- 11 01 07*** *pickling bases*
- 11 01 08*** *phosphatizing sludges*
- 11 01 09*** *sludges and filter cakes containing dangerous substances*
- 11 01 10** *sludges and filter cakes other than those mentioned in 11 01 09*
- 11 01 11*** *aqueous rinsing liquids containing dangerous substances*
- 11 01 12** *aqueous rinsing liquids other than those mentioned in 11 01 11*
- 11 01 13*** *degreasing wastes containing dangerous substances*
- 11 01 14** *degreasing wastes other than those mentioned in 11 01 13*
- 11 01 15*** *eluate and sludges from membrane systems or ion exchange systems containing dangerous substances*
- 11 01 16*** *saturated or spent ion exchange resins*
- 11 01 98*** *other wastes containing dangerous substances*
- 11 01 99** *wastes not otherwise specified*
- 11 02** **wastes from non-ferrous hydrometallurgical processes**
- 11 02 02*** *sludges from zinc hydrometallurgy (including jarosite, goethite)*
- 11 02 03** *wastes from the production of anodes for aqueous electrolytical processes*
- 11 02 05*** *wastes from copper hydrometallurgical processes containing dangerous substances*
- 11 02 06** *wastes from copper hydrometallurgical processes other than those mentioned in 11 02 05*
- 11 02 07*** *other wastes containing dangerous substances*

11 02 99	wastes not otherwise specified
11 03	sludges and solids from tempering processes
11 03 01*	<i>wastes containing cyanide</i>
11 03 02*	<i>other wastes</i>
11 05	wastes from hot galvanizing processes
11 05 01	hard zinc
11 05 02	zinc ash
11 05 03*	<i>solid wastes from gas treatment</i>
11 05 04*	<i>spent flux</i>
11 05 99	wastes not otherwise specified
12	WASTES FROM SHAPING AND PHYSICAL AND MECHANICAL SURFACE TREATMENT OF METALS AND PLASTICS
12 01	waste from shaping and physical and mechanical surface treatment of metals and plastics
12 01 01	ferrous metal filings and turnings ferrous metal dust and particles
12 01 02	non-ferrous metal filings and turnings
12 01 03	non-ferrous metal dust and particles
12 01 04	plastics shaving and turnings
12 01 05	mineral-based machining oils containing halogens (except emulsions and solutions)
12 01 06*	<i>mineral-based machining oils free of halogens (except emulsions and solutions)</i>
12 01 07*	<i>machining emulsions and solutions containing halogens</i>
12 01 08*	<i>machining emulsions and solutions free of halogens</i>
12 01 09*	<i>synthetic machining oils</i>
12 01 12*	<i>spent waxes and fats</i>
12 01 13	welding wastes
12 01 14*	<i>machining sludges containing dangerous substances</i>
12 01 15	machining sludges other than those mentioned in 12 01 14
12 01 16*	<i>waste blasting material containing dangerous substances</i>

- 12 01 17 waste blasting material other than those mentioned in 12 01 16
- 12 01 18* *metal sludge (grinding, honing and lapping sludge) containing oil***
- 12 01 19* *readily biodegradable machining oil***
- 12 01 20* *spent grinding bodies and grinding materials containing dangerous substances***
- 12 01 21 spent grinding bodies and grinding materials other than those mentioned in 12 01 20
- 12 01 99 wastes not otherwise specified
- 12 03 wastes from water and steam degreasing processes (except 11)**
- 12 03 01* *aqueous washing liquids***
- 12 03 02* *steam degreasing wastes***
- 13 OIL WASTES AND WASTES OF LIQUID FUELS (except edible oils, and those in chapters 05, 12 and 19)**
- 13 01 waste hydraulic oils**
- 13 01 01* *hydraulic oils, containing PCBs***
- 13 01 04* *chlorinated emulsions***
- 13 01 05* *non-chlorinated emulsions***
- 13 01 09* *mineral-based chlorinated hydraulic oils***
- 13 01 10* *mineral based non-chlorinated hydraulic oils***
- 13 01 11* *synthetic hydraulic oils***
- 13 01 12* *readily biodegradable hydraulic coils***
- 13 01 13* *other hydraulic oils***
- 13 02 waste engine, gear and lubricating oils**
- 13 02 04* *mineral-based chlorinated engine, gear and lubricating oils***
- 13 02 05* *mineral-based non-chlorinated engine, gear and lubricating oils***
- 13 02 06* *synthetic engine, gear and lubricating oils***
- 13 02 07* *readily biodegradable engine, gear and lubricating oils***
- 13 02 08* *other engine, gear and lubricating oils***
- 13 03 waste insulating and heat transmission oils**

13 03 01*	<i>insulating or heat transmission oils containing PCBs</i>
13 03 06*	<i>mineral-based chlorinated insulating and heat transmission oils other than those mentioned in 13 03 01</i>
13 03 07*	<i>mineral-based non-chlorinated insulating and heat transmission oils</i>
13 03 08*	<i>synthetic insulating and heat transmission oils</i>
13 03 09*	<i>readily biodegradable insulating and heat transmission oils</i>
13 03 10*	<i>other insulating and heat transmission oils</i>
13 04	bilge oils
13 04 01*	<i>bilge oils from inland navigation</i>
13 04 02*	<i>bilge oils from jetty sewers</i>
13 04 03*	<i>bilge oils from other navigation</i>
13 05	oil/water separator contents
13 05 01*	<i>solids from grit chambers and oil/water separators</i>
13 05 02*	<i>sludges from oil/water separators</i>
13 05 03*	<i>interceptor sludges</i>
13 05 06*	<i>oil from oil/water separators</i>
13 05 07*	<i>oily water from oil/water separators</i>
13 05 08*	<i>mixtures of wastes from grit chambers and oil/water separators</i>
13 07	wastes of liquid fuels
13 07 01*	<i>fuel oil and diesel</i>
13 07 02*	<i>petrol</i>
13 07 03*	<i>other fuels (including mixtures)</i>
13 08	oil wastes not otherwise specified
13 08 01*	<i>desalter sludges or emulsions</i>
13 08 02*	<i>other emulsions</i>
13 08 99*	<i>wastes not otherwise specified</i>
14	WASTE ORGANIC SOLVENTS, REFRIGERANTS AND PROPELLANTS (except 07 and 08)

- 14 06** waste organic solvent, refrigerants and foam/aerosol propellants
- 14 06 01*** *chlorofluorocarbons, HCFC, HFC*
- 14 06 02*** *other halogenated solvents and solvent mixtures*
- 14 06 03*** *other solvents and solvent mixtures*
- 14 06 04*** *sludges or solid wastes containing halogenated solvents*
- 14 06 05*** *sludges or solid wastes containing other solvents*
- 15** **WASTE PACKAGING; ABSORBENTS, WIPING CLOTHS, FILTER MATERIALS AND PROTECTIVE CLOTHING NOT OTHERWISE SPECIFIED**
- 15 01** **packaging (including separately collected municipal packaging waste)**
- 15 01 01 paper and cardboard packaging
- 15 01 02 plastic packaging
- 15 01 03 wooden packaging
- 15 01 04 metallic packaging
- 15 01 05 composite packaging
- 15 01 06 mixed packaging
- 15 01 07 glass packaging
- 15 01 09 textile packaging
- 15 01 10*** *packaging containing residues of or contaminated by dangerous substances*
- 15 01 11*** *metallic packaging containing a dangerous solid porous matrix (for example asbestos), including empty pressure containers*
- 15 02** **absorbents, filter materials, wiping cloths and protective clothing**
- 15 02 02*** *absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances*
- 15 02 03 absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02
- 16** **WASTES NOT OTHERWISE SPECIFIED IN THE LIST**
- 16 01** **end-of-life vehicles from different means of transport (including off-road machinery) and wastes from dismantling of end-of-life vehicles and vehicle maintenance (except 13, 14, 16 06 and 16 08)**

16 01 03	end-of-life tires
16 01 04	end-of-life vehicles
16 01 06	end-of-life vehicles, containing neither liquids nor other hazardous components
16 01 07*	<i>oil filters</i>
16 01 08*	<i>components containing mercury</i>
16 01 09*	<i>components containing PCBs</i>
16 01 10*	<i>explosive components (for example air bags)</i>
16 01 11*	<i>brake pads containing asbestos</i>
16 01 12	brake pads other than those mentioned in 16 01 11
16 01 13*	<i>brake fluids</i>
16 01 14*	<i>antifreeze fluids containing dangerous substances</i>
16 01 15	antifreeze fluids other than those mentioned in 16 01 14
16 01 16	tanks for liquefied gas
16 01 17	ferrous metal
16 01 18	non-ferrous metal
16 01 19	plastic
16 01 20	glass
16 01 21*	<i>hazardous components other than those mentioned in 16 01 07 to 16 01 11 and 16 01 13 and 16 01 14</i>
16 01 22	components not otherwise specified
16 01 99	wastes not otherwise specified
16 02	wastes from electrical and electronic equipment
16 02 09*	<i>transformers and capacitors containing PCBs</i>
16 02 10*	<i>discarded equipment containing or contaminated by PCBs other than those mentioned in 16 02 09</i>
16 02 11*	<i>discarded equipment containing chlorofluorocarbons, HCFC, HFC</i>
16 02 12*	<i>discarded equipment containing free asbestos</i>

- 16 02 13*** *discarded equipment containing hazardous components (¹) other than those mentioned in 16 02 09 to 16 02 12*
- 16 02 14 discarded equipment other than those mentioned in 16 02 09 to 16 02 13
- 16 02 15*** *hazardous components removed from discarded equipment*
- 16 02 16 components removed from discarded equipment other than those mentioned in 16 02 15
- 16 03** **off-specification batches and unused products**
- 16 03 03*** *inorganic wastes containing dangerous substances*
- 16 03 04 inorganic wastes other than those mentioned in 16 03 03
- 16 03 05*** *organic wastes containing dangerous substances*
- 16 03 06 organic wastes other than those mentioned in 16 03 05
- 16 04** **waste explosives**
- 16 04 01*** *waste ammunition*
- 16 04 02*** *fireworks wastes*
- 16 04 03*** *other waste explosives*
- 16 05** **gases in pressure containers and discarded chemicals**
- 16 05 04*** *gases in pressure containers (including halons) containing dangerous substances*
- 16 05 05 gases in pressure containers other than those mentioned in 16 05 04
- 16 05 06*** *laboratory chemicals, consisting of or containing dangerous substances, including mixtures of laboratory chemicals*
- 16 05 07*** *discarded inorganic chemicals consisting of or containing dangerous substances*
- 16 05 08*** *discarded organic chemicals consisting of or containing dangerous substances*
- 16 05 09 discarded chemicals other than those mentioned in 16 05 06, 16 05 07 or 16 05 08
- 16 06** **batteries and accumulators**
- 16 06 01*** *led batteries*
- 16 06 02*** *Ni-Cd batteries*
- 16 06 03*** *mercury-containing batteries*
- 16 06 04 alkaline batteries (except 16 06 03)

16 06 05	other batteries and accumulators
16 06 06*	<i>separately collected electrolyte from batteries and accumulators</i>
16 07	wastes from transport tank, storage tank and barrel cleaning (except 05 and 13)
16 07 08*	<i>wastes containing oil</i>
16 07 09*	<i>wastes containing other dangerous substances</i>
16 07 99	wastes not otherwise specified
16 08	spent catalysts
16 08 01	spent catalysts containing gold, silver, rhenium, rhodium, palladium, iridium or platinum (except 16 08 07)
16 08 02*	<i>spent catalysts containing dangerous transition metals (²) or dangerous transition metal compounds</i>
16 08 03	spent catalysts containing transition metals or transition metal compounds not otherwise specified
16 08 04	spent fluid catalytic cracking catalysts (except 16 08 07)
16 08 05*	<i>spent catalysts containing phosphoric acid</i>
16 08 06*	<i>spent liquids used as catalysts</i>
16 08 07*	<i>spent catalysts contaminated with dangerous substances</i>
16 09	oxidizing substances
16 09 01*	<i>permanganates, for example potassium permanganate</i>
16 09 02*	<i>chromates, for example potassium chromate, potassium or sodium</i>
16 09 03*	<i>dichromate peroxides, for example hydrogen peroxide</i>
16 09 04*	<i>oxidizing substances, not otherwise specified</i>
16 10	aqueous liquid wastes destined for off-site treatment
16 10 01*	<i>aqueous liquid wastes containing dangerous substances</i>
16 10 02	aqueous liquid wastes other than those mentioned in 16 10 01
16 10 03*	<i>aqueous concentrates containing dangerous substances</i>
16 10 04	aqueous concentrates other than those mentioned in 16 10 03
16 11	waste linings and refractories

- 16 11 01*** *carbon-based linings and refractories from metallurgical processes containing dangerous substances*
- 16 11 02 carbon-based linings and refractories from metallurgical processes others than those mentioned in 16 11 01
- 16 11 03*** *other linings and refractories from metallurgical processes containing dangerous substances*
- 16 11 04 other linings and refractories from metallurgical processes other than those mentioned in 16 11 03
- 16 11 05*** *linings and refractories from non-metallurgical processes containing dangerous substances*
- 16 11 06 linings and refractories from non-metallurgical processes others than those mentioned in 16 11 05
- 17 CONSTRUCTION AND DEMOLITION WASTES (INCLUDING EXCAVATED SOIL FROM CONTAMINATED SITES)**
- 17 01 concrete, bricks, tiles and ceramics**
- 17 01 01 concrete
- 17 01 02 bricks
- 17 01 03 tiles and ceramics
- 17 01 06*** *mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances*
- 17 01 07 mixtures of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06
- 17 02 woods, glass and plastic**
- 17 02 01 wood
- 17 02 02 glass
- 17 02 03 plastic
- 17 02 04*** *glass, plastic and wood containing or contaminated with dangerous substances*
- 17 03 bituminous mixtures, coal tar and tarred products**
- 17 03 01*** *bituminous mixtures containing coal tar*
- 17 03 02 bituminous mixtures other than those mentioned in 17 03 01
- 17 03 03*** *coal tar and tarred products*

17 04	metals (including their alloys)
17 04 01	copper, bronze, brass
17 04 02	aluminum
17 04 03	lead
17 04 04	zinc
17 04 05	iron and steel
17 04 06	tin
17 04 07	mixed metals
17 04 09*	<i>metal waste contaminated with dangerous substances</i>
17 04 10*	<i>cables containing oil, coal tar and other dangerous substances</i>
17 04 11	cables other than those mentioned in 17 04 10
17 05	soil (including excavated soil from contaminated sites), stones and dredging spoil
17 05 03*	<i>soil and stones containing dangerous substances</i>
17 05 04	soil and stones other than those mentioned in 17 05 03
17 05 05*	<i>dredging spoil containing dangerous substances</i>
17 05 06	dredging spoil other than those mentioned in 17 05 05
17 05 07*	<i>track ballast containing dangerous substances</i>
17 05 08	track ballast other than those mentioned in 17 05 07
17 06	insulation materials and asbestos-containing construction materials
17 06 01*	<i>insulation materials containing asbestos</i>
17 06 03*	<i>other insulation materials consisting of or containing dangerous substances</i>
17 06 04	insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05*	<i>construction materials containing asbestos</i>
17 08	gypsum-based construction material
17 08 01*	<i>gypsum-based construction materials contaminated with dangerous substances</i>
17 08 02	gypsum-based construction materials other than those mentioned in 17 08 01
17 09	other construction and demolition wastes

- 17 09 01*** *construction and demolition wastes containing mercury*
- 17 09 02*** *construction and demolition wastes containing PCB (for example PCB-containing sealants, PCB-containing resin-based floorings, PCB-containing sealed glazing units, PCB-containing capacitors)*
- 17 09 03*** *other construction and demolition wastes (including mixed wastes) containing dangerous substances*
- 17 09 04 mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03
- 18** **WASTES FROM HUMAN OR ANIMAL HEALTH CARE AND/OR RELATED RESEARCH** (except kitchen and restaurant wastes not arising from immediate health care)
- 18 01** **wastes from natal care, diagnosis, treatment or prevention of disease in humans**
- 18 01 01 sharps (except 18 01 03)
- 18 01 02 body parts and organs including blood bags and blood preserves (except 18 01 03)
- 18 01 03*** *wastes whose collection and disposal is subject to special requirements in order to prevent infection*
- 18 01 04 wastes whose collection and disposal is not subject to special requirements in order to prevent infection (for example dressings, plaster casts, linen, disposable clothing, diapers)
- 18 01 06*** *chemicals consisting of or containing dangerous substances*
- 18 01 07 chemicals other than those mentioned in 18 01 06
- 18 01 08*** *cytotoxic and cytostatic medicines*
- 18 01 09 medicines other than those mentioned in 18 01 08
- 18 01 10*** *amalgam waste from dental care*
- 18 02** **wastes from research, diagnosis, treatment or prevention of disease involving animals**
- 18 02 01 sharps (except 18 02 02)
- 18 02 02*** *wastes whose collection and disposal is subject to special requirements in order to prevent infection*
- 18 02 03 wastes whose collection and disposal is not subject to special requirements in order to prevent infection
- 18 02 05*** *chemicals consisting of or containing dangerous substances*

18 02 06	chemicals other than those mentioned in 18 02 05
18 02 07*	<i>cytotoxic and cytostatic medicines</i>
18 02 08	medicines other than those mentioned in 18 02 07
19	WASTES FROM WASTE MANAGEMENT FACILITIES, OFF-SITE WASTE WATER TREATMENT PLANTS AND THE PREPARATION OF WATER INTENDED FOR HUMAN CONSUMPTION AND WATER FOR INDUSTRIAL USE
19 01	wastes from incineration or pyrolysis of waste
19 01 02	ferrous materials removed from bottom ash
19 01 05*	<i>filter cake from gas treatment</i>
19 01 06*	<i>aqueous liquid wastes from gas treatment and other aqueous liquid wastes</i>
19 01 07*	<i>solid wastes from gas treatment</i>
19 01 10*	<i>spent activated carbon from flue-gas treatment</i>
19 01 11*	<i>bottom ash and slag containing dangerous substances</i>
19 01 12	bottom ash and slag other than those mentioned in 19 01 11
19 01 13*	<i>fly ash containing dangerous substances</i>
19 01 14	fly ash other than those mentioned in 19 01 13
19 01 15*	<i>boiler dust containing dangerous substances</i>
19 01 16	boiler dust other than those mentioned in 19 01 15
19 01 17*	<i>pyrolysis wastes containing dangerous substances pyrolysis</i>
19 01 18	wastes other than those mentioned in 19 01 17
19 01 19	sands from fluidized beds
19 01 99	wastes not otherwise specified
19 02	wastes from physico/chemical treatments of waste (including dechromatation, decyanidation, neutralization)
19 02 03	premixed wastes composed only of non-hazardous wastes
19 02 04*	<i>premixed wastes composed of at least one hazardous waste</i>
19 02 05*	<i>sludges from physico/chemical treatment containing dangerous substances</i>
19 02 06	sludges from physico/chemical treatment other than those mentioned in 19 02 05

- 19 02 07*** *oil and concentrates from separation*
- 19 02 08*** *liquid combustible wastes containing dangerous substances*
- 19 02 09*** *solid combustible wastes containing dangerous substances*
- 19 02 10 combustible wastes other than those mentioned in 19 02 08 and 19 02 09
- 19 02 11*** *other wastes containing dangerous substances*
- 19 02 99 wastes not otherwise specified
- 19 03** **stabilized/solidified wastes (³)**
- 19 03 04*** *wastes marked as hazardous, partly (⁴) stabilized*
- 19 03 05 stabilized wastes other than those mentioned in 19 03 04
- 19 03 06*** *wastes marked as hazardous, solidified*
- 19 03 07 solidified wastes other than those mentioned in 19 03 06
- 19 04** **vitriified waste and wastes from vitrification**
- 19 04 01 vitrified waste
- 19 04 02*** *fly ash and other flue-gas treatment wastes*
- 19 04 03*** *non-vitrified solid phase*
- 19 04 04 aqueous liquid wastes from vitrified waste tempering
- 19 05** **wastes from aerobic treatment of solid wastes**
- 19 05 01 non-composted fraction of municipal and similar wastes
- 19 05 02 non-composted fraction of animal and vegetable waste
- 19 05 03 off-specification compost
- 19 05 99 wastes not otherwise specified
- 19 06** **wastes from anaerobic treatment of waste**
- 19 06 03 liquor from anaerobic treatment of municipal waste
- 19 06 04 digestate from anaerobic treatment of municipal waste
- 19 06 05 liquor from anaerobic treatment of animal and vegetable waste
- 19 06 06 digestate from anaerobic treatment of animal and vegetable waste
- 19 06 99 wastes not otherwise specified

19 07	landfill leachate
19 07 02*	<i>landfill leachate containing dangerous substances</i>
19 07 03	landfill leachate other than those mentioned in 19 07 02
19 08	wastes from waste water treatment plants not otherwise specified
19 08 01	screenings
19 08 02	waste from desanding
19 08 05	sludges from treatment of urban waste water
19 08 06*	<i>saturated or spent ion exchange resins</i>
19 08 07*	<i>solutions and sludges from regeneration of ion exchangers</i>
19 08 08*	<i>membrane system waste containing heavy metals</i>
19 08 09	grease and oil mixture from oil/water separation containing only edible oil and fats
19 08 10*	<i>grease and oil mixture from oil/water separation other than those mentioned in 19 08 09</i>
19 08 11*	<i>sludges containing dangerous substances from biological treatment of industrial waste water</i>
19 08 12	sludges from biological treatment of industrial waste water other than those mentioned in 19 08 11
19 08 13*	<i>sludges containing dangerous substances from other treatment of industrial waste water</i>
19 08 14	sludges from other treatment of industrial waste water other than those mentioned in 19 08 13
19 08 99	wastes not otherwise specified
19 09	wastes from the preparation of water intended for human consumption or water for industrial use
19 09 01	solid waste from primary filtration and screenings
19 09 02	sludges from water clarification
19 09 03	sludges from decarbonation
19 09 04	spent activated carbon
19 09 05	saturated or spent ion exchange resins
19 09 06	solutions and sludges from regeneration of ion exchangers

19 09 99	wastes not otherwise specified
19 10	wastes from shredding of metal-containing wastes
19 10 01	iron and steel waste
19 10 02	non-ferrous waste
19 10 03*	<i>fluff-light fraction and dust containing dangerous substances</i>
19 10 04	fluff-light fraction and dust other than those mentioned in 19 10 03
19 10 05*	<i>other fractions containing dangerous substances</i>
19 10 06	other fractions other than those mentioned in 19 10 05
19 11	wastes from oil regeneration
19 11 01*	<i>spent filter clays</i>
19 11 02*	<i>acid tars</i>
19 11 03*	<i>aqueous liquid wastes</i>
19 11 04*	<i>wastes from cleaning of fuel with bases</i>
19 11 05*	<i>sludges from on-site effluent treatment containing dangerous substances</i>
19 11 06	sludges from on-site effluent treatment other than those mentioned in 19 11 05
19 11 07*	<i>wastes from flue-gas cleaning</i>
19 11 99	wastes not otherwise specified
19 12	wastes from the mechanical treatment of waste (for example sorting, crushing, compacting, pelletizing) not otherwise specified
19 12 01	paper and cardboard
19 12 02	ferrous metal
19 12 03	non-ferrous metal
19 12 04	plastic and rubber
19 12 05	glass
19 12 06*	<i>wood containing dangerous substances</i>
19 12 07	wood other than that mentioned in 19 12 06
19 12 08	textiles
19 12 09	minerals (for example sand, stones)

- 19 12 10 combustible waste (refuse derived fuel)
- 19 12 11* *other wastes (including mixtures of materials) from mechanical treatment of waste containing dangerous substances***
- 19 12 12 other wastes (including mixtures of materials) from mechanical treatment of wastes other than those mentioned in 19 12 11
- 19 13 wastes from soil and groundwater remediation**
- 19 13 01* *solid wastes from soil remediation containing dangerous substances***
- 19 13 02 solid wastes from soil remediation other than those mentioned in 19 13 01
- 19 13 03* *sludges from soil remediation containing dangerous substances***
- 19 13 04 sludges from soil remediation other than those mentioned in 19 13 03
- 19 13 05* *sludges from groundwater remediation containing dangerous substances***
- 19 13 06 sludges from groundwater remediation other than those mentioned in 19 13 05
- 19 13 07* *aqueous liquid wastes and aqueous concentrates from groundwater remediation containing dangerous substances***
- 19 13 08 aqueous liquid wastes and aqueous concentrates from groundwater remediation other than those mentioned in 19 13 07
- 20 MUNICIPAL WASTES (HOUSEHOLD WASTE AND SIMILAR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL WASTES) INCLUDING SEPARATELY COLLECTED FRACTIONS**
- 20 01 separately collected fractions (except 15 01)**
- 20 01 01 paper and cardboard
- 20 01 02 glass
- 20 01 08 biodegradable kitchen and canteen
- 20 01 10 waste clothes
- 20 01 11 textiles
- 20 01 13* *solvents***
- 20 01 14* *acids***
- 20 01 15* *alkalines***
- 20 01 17* *photo chemicals***
- 20 01 19* *pesticides***

20 01 21*	<i>fluorescent tubes and other mercury-containing waste</i>
20 01 23*	<i>discarded equipment containing chlorofluorocarbons</i>
20 01 25	edible oil and fat
20 01 26*	<i>oil and fat other than those mentioned in 20 01 25</i>
20 01 27*	<i>paint, inks, adhesives and resins containing dangerous substances</i>
20 01 28	paint, inks, adhesives and resins other than those mentioned in 20 01 27
20 01 29*	<i>detergents containing dangerous substances</i>
20 01 30	detergents other than those mentioned in 20 01 29
20 01 31*	<i>cytotoxic and cytostatic medicines</i>
20 01 32	medicines other than those mentioned in 20 01 31
20 01 33*	<i>batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries</i>
20 01 34	batteries and accumulators other than those mentioned in 20 01 33
20 01 35*	<i>discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components (¹)</i>
20 01 36	discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
20 01 37*	<i>wood containing dangerous substances</i>
20 01 38	wood other than that mentioned in 20 01 37
20 01 39	plastics
20 01 40	metals
20 01 41	wastes from chimney sweeping
20 01 99	other fractions not otherwise specified
20 02	garden and park wastes (including cemetery waste)
20 02 01	biodegradable waste
20 02 02	soil and stones
20 02 03	other non-biodegradable wastes
20 03	other municipal wastes

20 03 01	mixed municipal waste
20 03 02	waste from markets
20 03 03	street-cleaning residues
20 03 04	septic tank sludge
20 03 06	waste from sewage cleaning
20 03 07	bulky waste
20 03 99	municipal wastes not otherwise specified

Notes:

- (¹) Hazardous components from electrical and electronic equipment may include accumulators and batteries mentioned in 16 06 and marked as hazardous; mercury switches, glass from cathode ray tubes and other activated glass, etc.
- (²) For the purpose of this entry, transition metals are: scandium, vanadium, manganese, cobalt, copper, yttrium, niobium, hafnium, tungsten, titanium, chromium, iron, nickel, zinc, zirconium, molybdenum and tantalum. These metals or their compounds are dangerous if they are classified as dangerous substances. The classification of dangerous substances shall determine which among those transition metals and which transition metal compounds are hazardous.
- (³) Stabilization processes change the hazard of the constituents in the waste and thus transform hazardous waste into non-hazardous waste. Solidification processes only change the physical state of the waste (e.g. liquid into solid) by using additives without changing the chemical properties of the waste.
- (⁴) A waste is considered as partly stabilized if, after the stabilization process, dangerous constituents which have not been changed completely into non-dangerous constituents could be released into the environment in the short, middle or long term.

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