

US EPA ARCHIVE DOCUMENT

Hazardous Waste Characteristics

A User-Friendly Reference Document

October 2009

Table of Contents

Introduction.....	3
Overview of the Hazardous Waste Identification Process	5
Characteristic Hazardous Wastes	5
Summary Chart.....	7
General Hazardous Waste Resources	8
Regulations for the Identification of Hazardous Waste.....	9
General Resources for Hazardous Waste Characteristics.....	12
Ignitability.....	12
Regulations for Ignitable Liquids	13
Regulations for Ignitable Solids	14
Regulations for Ignitable Compressed Gas	14
Related Resources for Ignitable Compressed Gas.....	15
Regulations for Oxidizers.....	15
Regulations for the Hazardous Waste Number for Ignitability	16
General Resources for the Ignitability Characteristic.....	17
Corrosivity	18
Regulations for Aqueous Solutions	18
Regulations for Steel Corrosivity	19
Regulations for the Hazardous Waste Number for Corrosivity	19
General Resources for the Corrosivity Characteristic	20
Reactivity	20
Regulations for Reactivity	20
Regulations for Reactivity with Water	21
Regulations for Cyanide/Sulfide Reactivity	21
Regulations for Explosives.....	21
Regulations for the Hazardous Waste Number for Reactivity	22
General Resources for the Reactivity Characteristic	24
Toxicity	24
Regulations for Toxicity.....	24
General Resources for the Toxicity Characteristic.....	26

Introduction

This document describes the Environmental Protection Agency's (EPA's) hazardous waste characteristics regulations under the authority of the Resource Conservation and Recovery Act (RCRA) Subtitle C¹ and includes hyperlinks to information that EPA has generated over the years to explain the characteristics regulations. The objective of this document is to consolidate the information on characteristics regulations to assist Environmental Protection Agency (EPA) staff, state staff, industrial facilities that generate and manage hazardous wastes, and the public to understand the current RCRA hazardous waste characteristics regulations. The criteria for identifying the characteristics of hazardous wastes are located in [Title 40 of the Code of Federal Regulations \(CFR\) at Part 261](#). Please note that this reference document is designed to be web-based, so the usefulness of the document is maximized when it is viewed on a computer that is connected to the internet.

This document is only a reference document and is not to be used as a substitute for the CFR itself or the requirements contained in the CFR. This document is also not a rulemaking in any way. Additionally, this reference document presents only the federal requirements for hazardous waste characteristics. Most states are authorized to manage their hazardous waste management regulatory program. Therefore, states may have their own set of regulations that apply in lieu of federal regulations, and while most state hazardous waste regulations are based on the federal requirements, some states have developed regulations that are more stringent than the federal program. We direct you to the following website to determine if the state regulatory program is different from the federal program: <http://www.epa.gov/epawaste/wyl/stateprograms.htm>

This document is organized by hazardous waste characteristic (i.e., ignitable, corrosive, reactive and toxic), in a manner similar to the way the identification of hazardous waste regulations are presented in [Title 40 of the Code of Federal Regulations \(CFR\) at Part 261](#). Therefore, following an overview of the hazardous waste characteristics regulations, this document will present the definition of hazardous waste, criteria for identifying hazardous waste, and the definitions of each of the four characteristics of hazardous waste. Background information and relevant resources are also provided throughout this document.

To help stakeholders better understand specific requirements, we also have provided, where applicable, hyperlinks to Federal Register notices, frequently asked questions (FAQs), letters, and memoranda issued by EPA, as well as guidance and other relevant documents developed by EPA that provide further clarification of the hazardous waste characteristic regulations. We have attempted to identify the relevant related FAQs, letters, memoranda, etc. on a particular subject (miscellaneous resources can also be found in this document). However, please note that it is possible that EPA could have inadvertently overlooked a relevant document and did not include it in this reference document. Therefore, we cannot guarantee that we captured every relevant document in each and every instance. Additionally, once a user has navigated to the characteristics regulation of interest, we have provided hyperlinks to the [e-CFR](#) website when the characteristics regulations cross-reference themselves or other regulations.

¹ Subtitle C of RCRA has been codified in the United States Code (U.S.C.) as the Solid Waste Disposal Act (SDWA), Subchapter III (Hazardous Waste Management), 42 U.S.C. §§ 6921 through 6939e

Because regulations are promulgated throughout the year, EPA intends to update this reference document periodically to remain up-to-date with the hazardous waste regulatory requirements. However, as noted previously, this web-based reference document is not a substitute for the CFR itself or the requirements in the CFR. Additionally, the Government Printing Office frequently updates the [e-CFR](#) website to which the document is linked. The hyperlinks included in this document for Federal Register notices published prior to October 1994 are from HeinOnline and are only available only by subscription to HeinOnline. By including this material, EPA does not endorse HeinOnline.

This reference document assumes that a solid waste has been generated. Therefore, we have not included the applicable regulatory citations for determining if a solid waste (See 40 CFR [261.2](#)) has been generated. Similarly, we have not included the regulatory citations for specific exclusions from either the definition of solid waste and definition of hazardous waste found in 40 CFR [261.4](#), or the requirements for recyclable materials found in 40 CFR [261.6](#). Similar documents have been prepared compiling regulations applicable to generators of hazardous waste, “[Hazardous Waste Generator Regulations: A User-Friendly Reference Document, May 2007](#),” and the hazardous waste listings regulations, “[Hazardous Waste Listings: A User-Friendly Reference Document, Draft, March 2008](#).” Documents for Exclusions from the Definition of Solid Waste have also been developed, “[Definition of Solid Waste Compendium - Volume A: Exclusions](#)” and “[Identification and Listing of Hazardous Waste 40 CFR § 261.4\(b\): Exclusions: Solid Wastes Which are not Hazardous Wastes](#).” A collection of written materials about specific issues related to the definition of solid waste is available, “[DSW Compendium](#).”

This document was developed by the Materials Recovery and Waste Management Division in the Office of Resource Conservation and Recovery (formerly Office of Solid Waste). (Name change effective as per 74 FR 30228, June 25, 2009). Please direct any questions concerning this document to: helms.greg@epa.gov.

How to navigate this document

This document is navigable in several ways. First, generators can use the Summary Table to link directly to the regulatory citation of interest in the [Government Printing Office's Electronic Code of Federal Register website](#) (e-CFR) [EXIT Disclaimer](#) by left-clicking the mouse on the hyperlinks in the table. Clicking on the hyperlink will open the e-CFR in a new web-browser window, so the original document will also remain open. Secondly, users can take advantage of the Table of Contents (page 2 of the document) or the bookmarks (located on the left-hand side of the screen) to navigate through the body of the document. The Table of Contents and bookmarks are organized by hazardous waste characteristic. Users can navigate the document by clicking the left side of the mouse on the link of interest in the Table of Contents and bookmarks.

Overview of the Hazardous Waste Identification Process

EPA's regulations establish two ways of identifying solid wastes as hazardous under the Resource Conservation and Recovery Act RCRA. A waste may be considered hazardous if it exhibits certain hazardous properties ("characteristics") or if it is included on a specific list of wastes EPA has determined are hazardous ("listing" a waste as hazardous) because we found them to pose substantial present or potential hazards to human health or the environment. EPA's regulations in the Code of Federal Regulations ([40 CFR](#)) define four hazardous waste characteristic properties: ignitability, corrosivity, reactivity, or toxicity (see [40 CFR 261.21-261.24](#)). This document presents the regulations that will assist in identifying the characteristics of hazardous waste in §§ [261.31](#) through [261.33](#). Since EPA has developed a separate document for listed wastes, only characteristic wastes will be discussed in this document.

Characteristic Hazardous Wastes

A RCRA characteristic hazardous waste is a solid waste that exhibits at least one of four characteristics defined in [40 CFR Part 261 subpart C](#) — ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004 - D043).

- **Ignitability**– Ignitable wastes can create fires under certain conditions, are spontaneously combustible, or have a flash point less than 60 °C (140 °F). Examples include waste oils and used solvents. For more details, see [40 CFR §261.21](#). Test methods that may be used to determine ignitability include the [Pensky-Martens Closed-Cup Method for Determining Ignitability \(Method 1010A\)\(PDF\)](#)(1 pg, 19K), the [Setaflash Closed-Cup Method for Determining Ignitability \(Method 1020B\)\(PDF\)](#) (1 pg, 17K), the [Ignitability of Solids \(Method 1030\) \(PDF\)](#)(13 pp, 116K), [Test Method for Oxidizing Solids \(Method 1040\)\(PDF\)](#) (17 pp, 207K), and the [Test Method to Determine Substances Likely to Spontaneously Combust \(Method 1050\) \(PDF\)](#)(20 pp, 611K).
- **Corrosivity** – Corrosive wastes are acids or bases (pH less than or equal to 2, or greater than or equal to 12.5) and/or are capable of corroding metal containers, such as storage tanks, drums, and barrels. Battery acid is an example. For more details, see [40 CFR §261.22](#). The test method that may be used to determine the ability of a waste to corrode steel is the [Corrosivity Towards Steel \(Method 1110A\)\(PDF\)](#)(6 pp, 37K). To measure pH electrometrically, see [Method 9040C \(PDF\)](#)(5 pp, 25K).
- **Reactivity** – Reactive wastes are unstable under "normal" conditions. They can cause explosions, undergo violent reactions, generate toxic fumes, gases, or vapors or explosive mixtures when heated, compressed, or mixed with water. Examples include lithium-sulfur batteries and explosives. For more details, see [40 CFR §261.23](#). There are currently no test methods available.
- **Toxicity** – Toxic wastes are harmful or fatal when ingested or absorbed (e.g., containing mercury, lead, etc.). When toxic wastes are land disposed, contaminated liquid may leach from the waste and pollute ground water. Toxicity is defined through a laboratory

procedure called the [Toxicity Characteristic Leaching Procedure \(TCLP\) \(Method 1311\)\(PDF\)](#)(35 pp, 288K). The TCLP helps identify wastes likely to leach concentrations of contaminants that may be harmful to human health or the environment. For more details, see [40 CFR §261.24](#).

Summary Chart

Links to specific sections of the CFR Citations for the Characteristics of Hazardous Waste

Title	Section
Definition of Hazardous Waste - General	40 CFR <u>261.3</u>
Criteria for Identifying Characteristics of Hazardous Waste	40 CFR <u>261.10</u>
Characteristics of Hazardous Waste - General	40 CFR <u>261.20</u>
Characteristics of Ignitability	40 CFR <u>261.21</u>
Characteristics of Corrosivity	40 CFR <u>261.22</u>
Characteristics of Reactivity	40 CFR <u>261.23</u>
Toxicity Characteristic	40 CFR <u>261.24</u>
Hazardous waste determination	40 CFR <u>262.11</u>

General Hazardous Waste Resources

- Electronic Code of Federal Regulations
[e-CFR: Title 40-Protection of Environment \(Parts 260-265\)](#)
- Hazardous waste web page on the EPA website
<http://www.epa.gov/epawaste/hazard/index.htm>
- RCRA training modules
<http://www.epa.gov/osw/inforesources/pubs/hotline/rmods.htm>
- Training Document on Hazardous Waste Identification
<http://www.epa.gov/waste/inforesources/pubs/training/hwid05.pdf>
- General Questions on Hazardous Waste and Characteristics
[What is a RCRA hazardous waste?](#)
- Requirements for Generators of Hazardous Waste
<http://www.epa.gov/epawaste/hazard/generation/index.htm>
- Website for RCRA Frequent Questions Database
http://waste.custhelp.com/cgi-bin/waste.cfg/php/enduser/std_alp.php
- Environmental Justice
[Addressing Environmental Justice Issues In RCRA Programs](#)
- [Methods for Determining Characteristics](#) of Hazardous Waste, SW-846, Chapter 8

Important Federal Register Notices for Characteristic Hazardous Waste

- Proposed Rule – Hazardous Waste Guidelines and Regulations
[43 FR 58946, December 18, 1978](#)
- Final Rule and Interim Final Rule - Hazardous Waste Management System: General
[45 FR 33066, May 19, 1980](#)
- Petroleum Refining Process Waste - Notice of Data Availability
[68 FR 59935, October 20, 2003](#)

Regulations for the Identification of Hazardous Waste

This document is organized in a manner similar to the way the definition and identification of hazardous waste regulations are presented in [Title 40 of the Code of Federal Regulations \(CFR\) at Part 261](#).

Title 40: Protection of Environment

[PART 261 – Identification and Listing of Hazardous Waste](#)

Subpart C

§ [261.3](#) Definition of hazardous waste

A solid waste, as defined in §[261.2](#), is a hazardous waste if:

(i) It exhibits any of the characteristics of hazardous waste identified in subpart C of this part. However, any mixture of a waste from the extraction, beneficiation, and processing of ores and minerals excluded under §[261.4\(b\)\(7\)](#) and any other solid waste exhibiting a characteristic of hazardous waste under subpart C is a hazardous waste only if it exhibits a characteristic that would not have been exhibited by the excluded waste alone if such mixture had not occurred, or if it continues to exhibit any of the characteristics exhibited by the non-excluded wastes prior to mixture. Further, for the purposes of applying the Toxicity Characteristic to such mixtures, the mixture is also a hazardous waste if it exceeds the maximum concentration for any contaminant listed in Table 1 to §[261.24](#) that would not have been exceeded by the excluded waste alone if the mixture had not occurred or if it continues to exceed the maximum concentration for any contaminant exceeded by the nonexempt waste prior to mixture.

§ [261.3\(a\)\(2\)\(i\)](#)

(a) A solid waste, as defined in §[261.2](#), is a hazardous waste if:

(1) It is not excluded from regulation as a hazardous waste under §[261.4\(b\)](#); and

(2) It meets any of the following criteria:

(i) It exhibits any of the characteristics of hazardous waste identified in subpart C of this part. However, any mixture of a waste from the extraction, beneficiation, and processing of ores and minerals excluded under §[261.4\(b\)\(7\)](#) and any other solid waste exhibiting a characteristic of hazardous waste under subpart C is a hazardous waste only if it exhibits a characteristic that would not have been exhibited by the excluded waste alone if such mixture had not occurred, or if it continues to exhibit any of the characteristics exhibited by the non-excluded wastes prior to mixture. Further, for the purposes of applying the Toxicity Characteristic to such mixtures, the mixture is also a hazardous waste if it exceeds the maximum concentration for any contaminant listed in table 1 to §[261.24](#) that would not have been exceeded by the excluded waste alone if the

mixture had not occurred or if it continues to exceed the maximum concentration for any contaminant exceeded by the nonexempt waste prior to mixture.

§ [261.3\(b\)\(3\)](#)

(b) A solid waste which is not excluded from regulation under paragraph (a)(1) of this section becomes a hazardous waste when any of the following events occur:

(1) In the case of a waste listed in subpart D of this part, when the waste first meets the listing description set forth in subpart D of this part.

(2) In the case of a mixture of solid waste and one or more listed hazardous wastes, when a hazardous waste listed in subpart D is first added to the solid waste.

(3) In the case of any other waste (including a waste mixture), when the waste exhibits any of the characteristics identified in subpart C of this part.

§ [261.3\(c\)\(1\)](#)

(c) Unless and until it meets the criteria of paragraph (d) of this section:

(1) A hazardous waste will remain a hazardous waste.

§ [261.3\(d\)\(1\)](#)

(d) Any solid waste described in paragraph (c) of this section is not a hazardous waste if it meets the following criteria:

(1) In the case of any solid waste, it does not exhibit any of the characteristics of hazardous waste identified in subpart C of this part. (However, wastes that exhibit a characteristic at the point of generation may still be subject to the requirements of [part 268](#), even if they no longer exhibit a characteristic at the point of land disposal.)

[57 FR 7632, Mar. 3, 1992; 57 FR 23063, June 1, 1992, as amended at 57 FR 37263, Aug. 18, 1992; 57 FR 41611, Sept. 10, 1992; 57 FR 49279, Oct. 30, 1992; 59 FR 38545, July 28, 1994; 60 FR 7848, Feb. 9, 1995; 63 FR 28637, May 26, 1998; 63 FR 42184, Aug. 6, 1998; 66 FR 27297, May 16, 2001; 66 FR 50333, Oct. 3, 2001; 70 FR 34561, June 14, 2005; 70 FR 57784, Oct. 4, 2005; 71 FR 40258, July 14, 2006]

§ [261.10](#) **Criteria for identifying the characteristics of hazardous waste**

(a) The Administrator shall identify and define a characteristic of hazardous waste in subpart C only upon determining that:

(1) A solid waste that exhibits the characteristic may:

(i) Cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or

(ii) Pose a substantial present or potential hazard to human health or the environment when it is improperly treated, stored, transported, disposed of or otherwise managed; and

(2) The characteristic can be:

(i) Measured by an available standardized test method which is reasonably within the capability of generators of solid waste or private sector laboratories that are available to serve generators of solid waste; or

(ii) Reasonably detected by generators of solid waste through their knowledge of their waste.

(b) [Reserved]

PART 262 – Standards Applicable to Generators of Hazardous Waste

Subpart

§ 262.11 Hazardous waste determination

A person who generates a solid waste, as defined in [40 CFR 261.2](#), must determine if that waste is a hazardous waste using the following method:

(a) He should first determine if the waste is excluded from regulation under [40 CFR 261.4](#).

(b) He must then determine if the waste is listed as a hazardous waste in [subpart D of 40 CFR part 261](#).

Note: Even if the waste is listed, the generator still has an opportunity under [40 CFR 260.22](#) to demonstrate to the Administrator that the waste from his particular facility or operation is not a hazardous waste.

(c) For purposes of compliance with [40 CFR part 268](#), or if the waste is not listed in [subpart D of 40 CFR part 261](#), the generator must then determine whether the waste is identified in [subpart C of 40 CFR part 261](#) by either:

(1) Testing the waste according to the methods set forth in [subpart C of 40 CFR part 261](#), or according to an equivalent method approved by the Administrator under [40 CFR 260.21](#); or

(2) Applying knowledge of the hazard characteristic of the waste in light of the materials or the processes used.

(d) If the waste is determined to be hazardous, the generator must refer to parts 261, 264, 265, 266, 268, and 273 of this chapter for possible exclusions or restrictions pertaining to management of the specific waste.

[45 FR 33142, May 19, 1980, as amended at 45 FR 76624, Nov. 19, 1980; 51 FR 40637, Nov. 7, 1986; 55 FR 22684, June 1, 1990; 56 FR 3877, Jan. 31, 1991; 60 FR 25541, May 11, 1995]

General Resources for Hazardous Waste Characteristics

Representative Sampling

Appendix I to Part 261—[Representative Sampling Methods](#)

The methods and equipment used for sampling waste materials will vary with the form and consistency of the waste materials to be sampled. Samples collected using the sampling protocols listed below, for sampling waste with properties similar to the indicated materials, will be considered by the Agency to be representative of the waste.

[45 FR 33119, May 19, 1980, as amended at 70 FR 34562, June 14, 2005]

Sampling Plan

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) - [Sampling Plan](#)

Federal Register Notices

- Final Rule and Interim Final Rule - Hazardous Waste Management System: General [45 FR 33066, May 19, 1980](#)
- Petroleum Refining Process Wastes - Notice of Data Availability [68 FR 59935, October 20, 2003](#)

Letters/Memoranda

- [REGULATORY STATUS OF USED NICKEL CATALYST](#)
- [STATUS OF SPENT SILVER-BEARING PHOTOFIXER THAT IS RECLAIMED](#)
- [BIOSOLIDS](#)

Ignitability

The regulations for the hazardous characteristic of ignitability can be found at [40 CFR 261.21](#).

Regulations for Ignitable Liquids

§ [261.21](#)

(a) A solid waste exhibits the characteristic of ignitability if a [representative sample](#) of the waste has any of the following properties:

(1) It is a liquid, other than an aqueous solution containing less than 24 percent alcohol by volume and has flash point less than 60 °C (140 °F), as determined by a Pensky-Martens Closed Cup Tester (incorporated by reference, see [§260.11](#)), or a Setaflash Closed Cup Tester, using the test method specified in ASTM Standard D 3278–78 (incorporated by reference, see [§260.11](#)).

Letters/Memoranda

- [DETERMINATION OF THE IGNITABILITY CHARACTERISTIC](#)
- [USE OF PAINT FILTER LIQUIDS TEST TO DETERMINE FREE LIQUIDS IN A WASTE](#)
- [MIXTURES OF USED OIL AND CHARACTERISTIC HAZARDOUS WASTE](#)
- [USE OF ASTM METHOD D-56 IN IGNITABILITY DETERMINATIONS](#)
- [POSITION PAPER ON SPENT ABSORBENT MATERIALS](#)
- [DEFINING IGNITABLE LIQUIDS METHOD](#)
- [RESPONSE TO SPECIFIC QUESTIONS REGARDING HAZARDOUS WASTE IDENTIFICATION AND GENERATOR REGULATIONS](#)
- [ALCOHOL-CONTENT EXCLUSION FOR THE IGNITABILITY CHARACTERISTIC](#)
- [CLARIFICATION ON: MANIFEST DOCUMENT NUMBER; F003, F005, D001; WASTE DESTINED FOR RECYCLING; AND TREATMENT STANDARDS FOR CFC](#)
- [PRETREATMENT OF CHARACTERISTIC WASTES SUBJECT TO LAND DISPOSAL RESTRICTIONS](#)
- [AQUEOUS SOLUTION, IGNITABILITY DEFINED](#)
- [AQUEOUS WASTE AS IGNITABLE](#)
- [LIQUID WASTE, DEFINITION OF](#)
- [CLARIFICATION OF THE RECYCLED USED OIL MANAGEMENT STANDARDS AS THEY PERTAIN TO IGNITABLE USED OIL](#)
- [CLARIFICATION OF THE USED OIL REGULATIONS APPLICABLE TO MIXTURES OF USED OIL AND CHARACTERISTIC WASTE](#)
- [DEFINITION OF A LIQUID AS IT APPLIES TO IGNITABLE AND CORROSIVE WASTES; LIQUID AS IT APPLIES TO IGNITABLE OR CORROSIVE WASTES](#)

- [IGNITABILITY OR CORROSIVITY TESTING-LIQUID AND AQUEOUS DEFINITION](#)
 - [FLASH POINT TESTS AND THE IGNITABILITY CHARACTERISTIC](#)
 - [DEFINITION OF AQUEOUS](#)
-

Regulations for Ignitable Solids

§ [261.21\(a\)](#)

(2) It is not a liquid and is capable, under standard temperature and pressure, of causing fire through friction, absorption of moisture or spontaneous chemical changes and, when ignited, burns so vigorously and persistently that it creates a hazard.

Letters/Memoranda

- [FLASH POINT TESTING OF A WASTE FIBROUS FILTER MATERIAL](#)
 - [INDUSTRIAL WIPERS AND THE HAZARDOUS WASTE IDENTIFICATION RULE](#)
 - [HOW IGNITABLE SOLIDS AND SOLVENT CONTAMINATED RAGS OR SHOP TOWELS FIT INTO D001 CHARACTERISTIC OF IGNITABILITY](#)
 - [INTERPRETATION OF THE RCRA IGNITABILITY CHARACTERISTIC WITH REGARD TO ACETONE WIPES](#)
 - [CHARACTERIZATION OF NITROCELLULOSE FILTER FABRIC WASTE](#)
 - [REGULATORY STATUS OF METAL CASINGS CONTAINING SPENT POWDERED METALLIC OXIDE CATALYST](#)
 - [DETERMINATION OF THE IGNITABILITY CHARACTERISTIC](#)
 - [IGNITABLE SOLID DEFINITION APPLIED TO TITANIUM SWARE](#)
 - [IGNITABILITY CHARACTERISTIC TESTING FOR SOLIDS](#)
 - [CLARIFICATION OF THE CHARACTERISTIC OF IGNITABILITY AS IT PERTAINS TO SOLIDS VS. LIQUIDS](#)
 - [IGNITABILITY CHARACTERISTIC, DEFINITION OF UNDER STANDARD TEMPERATURE AND PRESSURE](#)
-

Regulations for Ignitable Compressed Gas

§ [261.21\(a\)](#)

(3) It is an ignitable compressed gas.

(i) The term “compressed gas” shall designate any material or mixture having in the container an absolute pressure exceeding 40 p.s.i. at 70 °F or, regardless of the pressure at 70 °F, having an absolute pressure exceeding 104 p.s.i. at 130 °F; or any liquid flammable material having a vapor pressure exceeding 40 p.s.i. absolute at 100 °F as determined by ASTM Test D–323.

(ii) A compressed gas shall be characterized as ignitable if any one of the following occurs:

(A) Either a mixture of 13 percent or less (by volume) with air forms a flammable mixture or the flammable range with air is wider than 12 percent regardless of the lower limit. These limits shall be determined at atmospheric temperature and pressure. The method of sampling and test procedure shall be acceptable to the Bureau of Explosives and approved by the director, Pipeline and Hazardous Materials Technology, U.S. Department of Transportation (see [Note 2](#)).

(B) Using the Bureau of Explosives' Flame Projection Apparatus (see [Note 1](#)), the flame projects more than 18 inches beyond the ignition source with valve opened fully, or, the flame flashes back and burns at the valve with any degree of valve opening.

(C) Using the Bureau of Explosives' Open Drum Apparatus (see [Note 1](#)), there is any significant propagation of flame away from the ignition source.

(D) Using the Bureau of Explosives' Closed Drum Apparatus (see [Note 1](#)), there is any explosion of the vapor-air mixture in the drum.

Letters/Memoranda

- [INCINERATORS THAT RECEIVE GASEOUS EMISSIONS, RCRA EXCLUSION, CAA APPLIES](#)

Regulations for Oxidizers

§ 261.21(a)

(4) It is an oxidizer. An oxidizer for the purpose of this subchapter is a substance such as a chlorate, permanganate, inorganic peroxide, or a nitrate, that yields oxygen readily to stimulate the combustion of organic matter (see [Note 4](#)).

(i) An organic compound containing the bivalent -O-O- structure and which may be considered a derivative of hydrogen peroxide where one or more of the hydrogen atoms have been replaced by organic radicals must be classed as an organic peroxide unless:

(A) The material meets the definition of a Class A explosive or a Class B explosive, as defined in [§261.23\(a\)\(8\)](#), in which case it must be classed as an explosive,

(B) The material is forbidden to be offered for transportation according to [49 CFR 172.101](#) and [49 CFR 173.21](#),

(C) It is determined that the predominant hazard of the material containing an organic peroxide is other than that of an organic peroxide, or

(D) According to data on file with the [Pipeline and Hazardous Materials Safety Administration](#) in the U.S. Department of Transportation (see [Note 3](#)), it has been determined that the material does not present a hazard in transportation.

Letters/Memoranda

- [APPLICABILITY OF HAZARDOUS WASTE CODES TO A CHEMICAL POLISHING SYSTEM](#)
 - [RCRA APPLICABILITY TO POTASSIUM PERMANGANATE AND MANGANESE DISPOSAL](#)
 - [NITRIC ACID WASTE CHARACTERIZATION](#)
 - [REGULATORY STATUS OF METAL CASINGS CONTAINING SPENT POWDERED METALLIC OXIDE CATALYST](#)
-

Regulations for the Hazardous Waste Number for Ignitability

§ 261.21

(b) A solid waste that exhibits the characteristic of ignitability has the EPA Hazardous Waste Number of D001.

Note 1: A description of the Bureau of Explosives' Flame Projection Apparatus, Open Drum Apparatus, Closed Drum Apparatus, and method of tests may be procured from the Bureau of Explosives.

Note 2: As part of a U.S. Department of Transportation (DOT) reorganization, the Office of Hazardous Materials Technology (OHMT), which was the office listed in the 1980 publication of 49 CFR 173.300 for the purposes of approving sampling and test procedures for a flammable gas, ceased operations on February 20, 2005. OHMT programs have moved to the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the DOT.

Note 3: As part of a U.S. Department of Transportation (DOT) reorganization, the Research and Special Programs Administration (RSPA), which was the office listed in the 1980 publication of 49 CFR 173.151a for the purposes of determining that a material does not present a hazard in transport, ceased operations on February 20, 2005. RSPA programs have moved to the Pipeline and Hazardous Materials Safety Administration (PHMSA) in the DOT.

Note 4: The DOT regulatory definition of an oxidizer was contained in §173.151 of 49 CFR, and the definition of an organic peroxide was contained in paragraph 173.151a. An organic peroxide is a type of oxidizer.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 70 FR 34561, June 14, 2005; 71 FR 40259, July 14, 2006]

Letters/Memoranda

- [PRETREATMENT OF CHARACTERISTIC WASTES SUBJECT TO LAND DISPOSAL RESTRICTIONS](#)
 - [REGULATORY REQUIREMENTS APPLICABLE TO TWO WASTE STREAMS THAT WOULD BE BILAYERED THROUGH PHASE SEPARATION AT A LICENSED TSDF](#)
 - [SOLVENT-CONTAMINATED WASTEWATER FROM FRAGRANCE MANUFACTURE](#)
 - [END-USERS OF CHLORDIMEFORM EXEMPTION](#)
 - [MIXTURE OF METHANOL AND SOLID WASTE WHICH DOES NOT EXHIBIT ANY CHARACTERISTICS](#)
-

General Resources for the Ignitability Characteristic

- [Background document for the Ignitability characteristic](#)

Test Methods

Test methods are not required by the Federal regulations to determine if a waste passes or fails the characteristic of ignitability according to the RCRA regulatory definition at 40 CFR [261.21](#). To clarify, the test results of these methods cannot be used to directly classify a waste as a D001 hazardous waste, nor can the results be used by themselves to definitively classify a waste as non-hazardous. No specific test for defining ignitable solids or oxidizers is required by the RCRA regulations, and only a waste meeting the narrative regulatory definitions at 40 CFR [261.21\(a\)\(2\)](#) and/or [261.21\(a\)\(4\)](#) is an ignitable hazardous waste because it is an ignitable solid and/or an oxidizer. However, these test methods were developed to specifically illustrate the ignitable and oxidizer properties of materials, including wastes, and their results provide relevant and useful information that may be applied to knowledge of a waste in determining whether a waste meets the 40 CFR 261.21(a) criteria.

- SW-846 Test Method for Ignitability of Solids – [Test Method 1030](#)
- SW-846 Test Method for Oxidizing Solids – [Test Method 1040](#)
- SW-846 Test Method to Determine Substances Likely to Spontaneously Combust - [Test Method 1050](#)
- Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) – [Sampling Plan](#)

Federal Register Notices

- Proposed Rule – Hazardous Waste Guidelines and Regulations: [43 FR 58946, December 18, 1978](#)
 - Final Rule - Land Disposal Restrictions for Third Third Scheduled Wastes [55 FR 22520, June 1, 1990](#)
 - Proposed Rule – Hazardous Waste Management System; Testing and Monitoring Activities: [58 FR 46052, August 31, 1993](#)
 - Proposed Rule – Land Disposal Restrictions Phase IV: Treatment Standards for Wood Preserving Wastes, Exemptions from RCRA for Certain Processed Materials/Mineral Processing and Bevill Exclusion Issues and the Use of Hazardous Waste as Fill: [62 FR 25997, May 12, 1997](#)
 - Proposed Rule – Hazardous Waste Management System; Testing and Monitoring Activities: [58 FR 46052, August 31, 1993](#)
-

Corrosivity

The regulations for the hazardous characteristic of corrosivity can be found at [40 CFR 261.22](#).

Regulations for Aqueous Solutions

§ [261.21](#)

(a) A solid waste exhibits the characteristic of corrosivity if a [representative sample](#) of the waste has either of the following properties:

- (1) It is [aqueous](#) and has a pH less than or equal to 2 or greater than or equal to 12.5, as determined by a pH meter using [Method 9040C](#) in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in §260.11 of this chapter.

Federal Register Notice

- Final Rule: Hazardous Waste Management System: Testing and Monitoring Activities (Evaluating Aqueousness) [60 FR 3089, January 13, 1995](#)

Letters/Memoranda

- [INTERPRETATION OF "AQUEOUS" AS APPLIED TO THE CORROSIVITY CHARACTERISTIC](#)
- [“AQUEOUS” AS APPLIED TO THE CORROSIVITY CHARACTERISTIC](#)

- [USE OF PAINT FILTER LIQUIDS TEST TO DETERMINE FREE LIQUIDS IN A WASTE](#)
 - [CORROSIVE CHARACTERISTIC APPLIED TO LIQUID AND AQUEOUS WASTES](#)
 - [IGNITABILITY OR CORROSIVITY TESTING-LIQUID AND AQUEOUS DEFINITION](#)
 - [APPLICABILITY OF CORROSIVITY PH AND STEEL CORROSION TESTS](#)
 - [DEFINITION OF A LIQUID AS IT APPLIES TO IGNITABLE AND CORROSIVE WASTES; LIQUID AS IT APPLIES TO IGNITABLE OR CORROSIVE WASTES](#)
 - [PH MEASUREMENT ON PARTIAL SOLIDS](#)
-

Regulations for Steel Corrosivity

§ 261.22(a)

(2) It is a liquid and corrodes steel (SAE 1020) at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55 °C (130 °F) as determined by [Method 1010A](#) in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, and as incorporated by reference in §260.11 of this chapter.

Letters/Memoranda

- [SW-846 TEST METHODS](#)
 - [AGITATE SAMPLES EVALUATED USING METHOD 1110](#)
 - [SPENT PICKLE LIQUOR CORROSIVITY](#)
-

Regulations for the Hazardous Waste Number for Corrosivity

§ 261.22

(b) A solid waste that exhibits the characteristic of corrosivity has the EPA Hazardous Waste Number of D002.

[45 FR 33119, May 19, 1980, as amended at 46 FR 35247, July 7, 1981; 55 FR 22684, June 1, 1990; 58 FR 46049, Aug. 31, 1993; 70 FR 34561, June 14, 2005]

Letters/Memoranda

- [CORROSIVITY CHARACTERISTIC AS IT APPLIES TO SOLIDS](#)
- [LAND DISPOSAL RESTRICTION INTERIM FINAL RULE](#)
- [PRECIPITATION WHICH IS CORROSIVE DUE TO CONTACT WITH EXEMPT WASTES \(COAL GASIFICATION ASH\)](#)

- [NITRIC ACID WASTE CHARACTERIZATION](#)
 - [ELEMENTARY NEUTRALIZATION UNITS GENERATING AND STORING NON-CORROSIVE HAZARDOUS WASTES](#)
 - [POLLUTION CONTROL SLUDGE FROM TREATMENT OF MINING WASTE - EXCLUSION](#)
 - [CEMENT KILN DUST WASTE](#)
 - [BATTERIES, WASTE ELECTROLYTE FROM RECHARGEABLE NICKEL-CADMIUM](#)
 - [BATTERIES, SCRAP METAL, AND PRECIOUS METALS](#)
 - [FOOD PROCESSORS, IMPACT OF HAZARDOUS WASTE REGULATIONS ON](#)
 - [LIQUID, FREE LIQUID, RELEASABLE LIQUID DEFINITIONS](#)
 - [REGULATORY STATUS OF LABORATORY WASTEWATER](#)
-

General Resources for the Corrosivity Characteristic

- [Background document for the Corrosivity Characteristic](#)
 - "Determination of Water in Waste Materials by Karl Fisher Titration." – [Method 9000](#)
 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) - [Sampling Plan](#)
 - Determination of Water in Waste Materials by Quantitative Calcium Hydride Reaction; [Method 9001](#)
 - [Corrosivity Definition of Aqueous](#)
-

Reactivity

The regulations for the hazardous characteristic of reactivity can be found at [40 CFR 261.23](#).

Regulations for Reactivity

§ [261.23](#)

(a) A solid waste exhibits the characteristic of reactivity if a [representative sample](#) of the waste has any of the following properties:

- (1) It is normally unstable and readily undergoes violent change without detonating.
-

Regulations for Reactivity with Water

§ 261.23(a)

- (2) It reacts violently with water.

- (3) It forms potentially explosive mixtures with water.

- (4) When mixed with water, it generates toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

Letters/Memoranda

- [CHEMICAL AGENTS GB, VX, AND HD AT MUNITIONS DISPOSAL FACILITY](#)
 - [REGULATION AND DISPOSAL REQUIREMENTS FOR SODIUM AZIDE](#)
-

Regulations for Cyanide/Sulfide Reactivity

§ 261.23(a)

- (5) It is a cyanide or sulfide bearing waste which, when exposed to pH conditions between 2 and 12.5, can generate toxic gases, vapors or fumes in a quantity sufficient to present a danger to human health or the environment.

Letters/Memoranda

- [WITHDRAWAL OF CYANIDE AND SULFIDE GUIDANCE](#)
 - [HAZARDOUS WASTE TESTING ISSUES](#)
-

Regulations for Explosives

§ 261.23(a)

- (6) It is capable of detonation or explosive reaction if it is subjected to a strong initiating source or if heated under confinement.

- (7) It is readily capable of detonation or explosive decomposition or reaction at standard temperature and pressure.

(8) It is a forbidden explosive as defined in 49 CFR 173.51, or a Class A explosive as defined in 49 CFR 173.53 or a Class B explosive as defined in 49 CFR 173.88.

Letters/Memoranda

- [TRANSPORTATION AND DISPOSAL OF SHOCK SENSITIVE OR EXPLOSIVE MATERIALS](#)
 - [DOT REGULATIONS REFERENCED IN THE RCRA REGULATIONS](#)
 - [REGULATORY ISSUES PERTAINING TO WASTES CONTAMINATED WITH EXPLOSIVE RESIDUES](#)
 - [REACTIVE WASTE - EXPLOSIVITY](#)
-

Regulations for the Hazardous Waste Number for Reactivity

§ 261.23

(b) A solid waste that exhibits the characteristic of reactivity has the EPA Hazardous Waste Number of D003.

[45 FR 33119, May 19, 1980, as amended at 55 FR 22684, June 1, 1990]

Letters/Memoranda

Aerosols

- [BUBBLER CANISTERS CONTAINING PHOSPHOROUS OXYCHLORIDE ARE NOT WASTE WHEN RETURNED TO THE UNITED STATES FROM JAPAN FOR REGENERATION](#)
- [REGULATORY STATUS OF WASTE AEROSOL CANS](#)
- [CLARIFICATION OF REACTIVITY CHARACTERISTIC AS IT PERTAINS TO AEROSOL CANS](#)
- [REGULATORY STATUS OF USED RESIDENTIAL AND COMMERCIAL/INDUSTRIAL AEROSOL CANS](#)

Ammunition

- [REGULATORY STATUS OF METAL CASINGS CONTAINING SPENT POWDERED METALLIC OXIDE CATALYST](#)
- [SMALL ARMS AMMUNITION REACTIVITY, OFF SPECIFICATION](#)
- [CLARIFICATION OF DISCARDED AMMUNITION OF 0.50 CALIBER](#)

Batteries

- [REACTIVE CHARACTERISTICS OF DISCHARGED LI/SO₂ BATTERIES](#)
- [REGULATORY STATUS OF SPENT/DISCARDED LITHIUM-SULFUR DIOXIDE BATTERIES](#)
- [WASTE CHARACTERIZATION: LITHIUM BATTERIES](#)
- [REGULATORY STATUS OF BATTERIES](#)

Flameless Ration Heaters

- [CLASSIFICATION AND DISPOSAL OF UNUSED FLAMELESS RATION HEATERS](#)
- [APPLICABILITY OF RCRA TO DISPOSAL OF UNIFIED GROUP RATION - EXPRESS \(UGR-E\)](#)
- [STATUS OF WASTE HYDROGEN FREE RATION HEATERS \(HRHs\)](#)

Explosives

- [BLASTING CAPS AS REACTIVE WASTES](#)
- [DETONATING EXPLOSIVE WASTES](#)
- [DISCARDED CLASS C EXPLOSIVES](#)

General

- [LEAKS, SPILLS, AND ILLEGAL DISCHARGES OF LISTED WASTES TO SURFACE WATERS. MIXTURE RULE APPLIED TO](#)
- [REGULATORY STATUS OF UNIT AND WASTE IF NONHAZARDOUS WASTE BECOMES REACTIVE WHEN DEWATERED](#)
- [RCRA HAZARDOUS WASTE DETERMINATION OF SPENT NUCLEAR REACTOR FUELS](#)
- [APPLICABILITY OF 40 CFR 261.5 TO K047](#)
- [DREDGE SEDIMENTS](#) (See Note 5)

Note 5:

§261.4(g) Exclusions

(g) *Dredged material that is not a hazardous waste.* Dredged material that is subject to the requirements of a permit that has been issued under 404 of the Federal Water Pollution Control Act (33 U.S.C.1344) or section 103 of the Marine Protection, Research, and Sanctuaries Act of 1972 (33 U.S.C. 1413) is not a hazardous waste. For this paragraph (g), the following definitions apply:

(1) The term *dredged material* has the same meaning as defined in 40 CFR 232.2;

[45 FR 33119, May 19, 1980]

Federal Register Notice

- Military Munitions Rule
[62 FR 6622](#), February 12, 1997

General Resources for the Reactivity Characteristic

- [Background document for the Reactivity characteristic](#)

Toxicity

The regulations for the hazardous characteristic of toxicity can be found at [40 CFR 261.24](#).

Regulations for Toxicity

§261.24

(a) A solid waste (except manufactured gas plant waste) exhibits the characteristic of toxicity if, using the Toxicity Characteristic Leaching Procedure, test Method 1311 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in §260.11 of this chapter, the extract from a representative sample of the waste contains any of the contaminants listed in table 1 at the concentration equal to or greater than the respective value given in that table. Where the waste contains less than 0.5 percent filterable solids, the waste itself, after filtering using the methodology outlined in Method 1311, is considered to be the extract for the purpose of this section.

(b) A solid waste that exhibits the characteristic of toxicity has the EPA Hazardous Waste Number specified in Table 1 which corresponds to the toxic contaminant causing it to be hazardous.

Table 1 —Maximum Concentration of Contaminants for the Toxicity Characteristic

EPA HW No.¹	Contaminant	CAS No.²	Regulatory Level (mg/L)
D004	Arsenic	7440-38-2	5.0
D005	Barium	7440-39-3	100.0
D018	Benzene	71-43-2	0.5
D006	Cadmium	7440-43-9	1.0
D019	Carbon tetrachloride	56-23-5	0.5
D020	Chlordane	57-74-9	0.03
D021	Chlorobenzene	108-90-7	100.0
D022	Chloroform	67-66-3	6.0

D007	Chromium	7440-47-3	5.0
D023	o-Cresol	95-48-7	⁴ 200.0
D024	m-Cresol	108-39-4	⁴ 200.0
D025	p-Cresol	106-44-5	⁴ 200.0
D026	Cresol		⁴ 200.0
D016	2,4-D	94-75-7	10.0
D027	1,4-Dichlorobenzene	106-46-7	7.5
D028	1,2-Dichloroethane	107-06-2	0.5
D029	1,1-Dichloroethylene	75-35-4	0.7
D030	2,4-Dinitrotoluene	121-14-2	³ 0.13
D012	Endrin	72-20-8	0.02
D031	Heptachlor (and its epoxide)	76-44-8	0.008
D032	Hexachlorobenzene	118-74-1	³ 0.13
D033	Hexachlorobutadiene	87-68-3	0.5
D034	Hexachloroethane	67-72-1	3.0
D008	Lead	7439-92-1	5.0
D013	Lindane	58-89-9	0.4
D009	Mercury	7439-97-6	0.2
D014	Methoxychlor	72-43-5	10.0
D035	Methyl ethyl ketone	78-93-3	200.0
D036	Nitrobenzene	98-95-3	2.0
D037	Pentachlorophenol	87-86-5	100.0
D038	Pyridine	110-86-1	³ 5.0
D010	Selenium	7782-49-2	1.0
D011	Silver	7440-22-4	5.0
D039	Tetrachloroethylene	127-18-4	0.7
D015	Toxaphene	8001-35-2	0.5
D040	Trichloroethylene	79-01-6	0.5
D041	2,4,5-Trichlorophenol	95-95-4	400.0
D042	2,4,6-Trichlorophenol	88-06-2	2.0

D017	2,4,5-TP (Silvex)	93-72-1	1.0
D043	Vinyl chloride	75-01-4	0.2

¹Hazardous waste number.

²Chemical abstracts service number.

³Quantitation limit is greater than the calculated regulatory level. The quantitation limit therefore becomes the regulatory level.

⁴If o-, m-, and p-Cresol concentrations cannot be differentiated, the total cresol (D026) concentration is used. The regulatory level of total cresol is 200 mg/l.

[55 FR 11862, Mar. 29, 1990, as amended at 55 FR 22684, June 1, 1990; 55 FR 26987, June 29, 1990; 58 FR 46049, Aug. 31, 1993; 67 FR 11254, Mar. 13, 2002; 71 FR 40259, July 14, 2006]

General Resources for the Toxicity Characteristic

- [Methods for Determining Characteristics](#) of Hazardous Waste, SW-846, Chapter 8

Federal Register Notices

- Final Rule: Toxicity Characteristic
[55 FR 11829: March 29, 1,90](#)
- Proposed Rule: Hazardous Waste Management System; Modification of the Hazardous Waste Recycling Regulatory Program
[58 FR 8102, February 11, 1993](#)
- Request for Comment on Proposed Statement of Policy Regarding Spent Antifreeze
[63 FR 20187, April 23, 1998](#)

Letters/Memoranda

Antifreeze

- [USED AUTOMOBILE ANTIFREEZE DISPOSAL](#)
- [SPENT ANTI-FREEZE COOLANT REGULATORY STATUS](#)
- [SPENT ANTIFREEZE AND THE TOXICITY CHARACTERISTIC](#)

Biosolids

- [BIOSOLIDS](#)

Chromium/Trivalent Chromium

- [HAZARDOUS WASTE TESTING ISSUES](#)

- [RULEMAKING PETITION FOR TRIVALENT CHROMIUM EXCLUSION](#)
- [PETITION PROCESS FOR THE TRIVALENT CHROMIUM EXCLUSION](#)
- [TOTAL CHROMIUM ANALYSIS](#)

Chromated Copper Arsenate (CCA) Treated Wood

- [CCA TREATED WOOD WHEN DISPOSED](#)
- [WOOD MULCH DERIVED FROM WASTE LUMBER PRESERVED WITH CHROMATED COPPER ARSENATE \(CCA\)](#)
- [RECOMMENDATION ON THE DISPOSAL OF WASTE LUMBER PRESERVED WITH CHROMATED COPPER ARSENATE \(CCA\)](#)
- [CURRENT STATUS OF CCA-TREATED WOOD UNDER RCRA](#)

Explosive Waste/Military Munitions

- [APPLICABILITY OF THE TCLP TO WASTE MUNITIONS](#)
- [TCLP PARTICLE SIZE REDUCTION EXEMPTION FOR MUNITIONS](#)
- [COMBUSTION PROHIBITION AND EXPLOSIVE WASTES](#)

Lead/Lead-Based Paint

- [LEADED PAINT SANDBLASTING WASTE TESTING USING TCLP](#)
- [TCLP AND LEAD PAINT REMOVAL DEBRIS](#)
- [LEAD PAINT REMOVAL DEBRIS AND THE TCLP PROCEDURE](#)
- [RCRA APPLICABILITY TO PAINT REMOVAL WASTES](#)
- [INCORPORATION OF PRETOX 2000 INTO LEADED PAINT STRIPPER](#)
- [RECYCLING OF MOLDING AND CASTING SANDS](#)
- [LEACH TESTING PROCEDURE TO REMOVE LEAD-CONTAMINATED SOILS FROM RESIDENTIAL AREAS](#)
- [MANAGEMENT AND DISPOSAL OF WASTE VINYL MINI BLINDS](#)
- [PROPOSED TSCA 403 SOIL LEAD HAZARD AND OSWER'S LEAD-IN-SOILS POLICY](#)

Manufactured Gas Plant (MGP)

- [IMPLEMENTATION OF VACATURE OF TCLP USE FOR EVALUATING MANUFACTURED GAS PLANT \(MGP\) WASTES IN THE BATTERY RECYCLERS CASE](#)
- [MANUFACTURED GAS PLANT \(MGP\) REMEDIATION WASTE](#)

Mercury/Mercury Lamps

- [MANAGEMENT OF USED FLUORESCENT LAMPS](#)
- [STATUS OF FLUORESCENT LAMPS UNDER RCRA](#)
- [DETERMINATION ON WHETHER A GENERATOR'S FLUORESCENT TUBES ARE NONHAZARDOUS](#)
- [MANAGEMENT OF USED FLUORESCENT LAMPS](#)
- [MERCURY DRY CELL BATTERIES AND APPLICABLE REGULATIONS](#)
- [WASTE IDENTIFICATION OF DISCARDED THERMOMETERS](#)

Municipal Waste Combustion Ash

- [SAMPLING AND ANALYSIS OF MUNICIPAL REFUSE INCINERATOR ASH](#); Draft 05/15/1994
- [GUIDANCE FOR THE SAMPLING AND ANALYSIS OF MUNICIPAL WASTE COMBUSTION ASH FOR THE TOXICITY CHARACTERISTIC](#); June 1995
- [STATUS OF MUNICIPAL WASTE COMBUSTION ASH](#)
- [RESIDUES FROM MUNICIPAL WASTE RESOURCE RECOVERY FACILITIES: MUNICIPAL WASTE COMBUSTION RESIDUES-ASH AND SLUDGE](#)
- [MUNICIPAL WASTE COMBUSTION, DISPOSAL OF RESIDUAL ASH](#)

Oily Waste/Used Oil

- [USED OIL FILTERS CLASSIFICATION](#)
- [TC RULE RELATIONSHIP TO USED OIL FILTER DISPOSAL](#)
- [APPLICABILITY OF THE TOXICITY CHARACTERISTIC TO USED OIL FILTERS](#)
- [TC RULE DELAY OF IMPOSITION ON OIL FILTERS](#)
- [TCLP EXTRACTIONS APPLIED TO LIQUID WASTES, OILS AND SOLVENT-BASED PRODUCTS](#)
- [TCLP EXTRACTIONS AS THEY APPLY TO OILY WASTE](#)
- [QUESTIONS ON FINAL USED OIL RULE](#)
- [DILUTION OF TEST SAMPLING](#)
- [USED OIL USED FOR DUST SUPPRESSION OR ROAD TREATMENT](#)
- [CLARIFICATION OF THE USED OIL REGULATIONS APPLICABLE TO MIXTURES OF USED OIL AND CHARACTERISTIC WASTE](#)

- [REGULATORY REQUIREMENTS PERTAINING TO THE MANAGEMENT OF WASTE SOLVENTS AND USED OIL](#)

Toxicity Characteristic Leaching Procedure (TCLP)

- [SAMPLE HOLDING TIMES AND VALIDITY OF ANALYTICAL RESULTS](#)
- [DILUTION OF TEST SAMPLING](#)
- [EXEMPTION FROM PARTICLE SIZE REDUCTION STEP IN TCLP](#)
- [MATRIX SPIKE IN TCLP PROCEDURE](#)
- [ANALYSIS OF FLUFF MATERIALS](#)
- [GENERATOR HAZARDOUS WASTE DETERMINATION AND THE TCLP](#)
- [APPLICABILITY OF THE TCLP](#)
- [APPLICABILITY OF THE TOXICITY CHARACTERISTIC AND THE TCLP](#)
- [BIAS CORRECTION APPLIED TO THE TCLP](#)
- [TC RULE HAZARDOUS WASTE DETERMINATION](#)
- [SEMI-VOLATILE CONSTITUENT ANALYSIS AND ANALYTICAL LEVEL OF DETECTION LIMITATIONS OF THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE \(TCLP\)](#)
- [INTERPRETATION OF THE PHRASE ""WHICH CAN BE REASONABLY EXPECTED TO BE PRESENT"" FOR SOIL THAT EXHIBITS THE TOXICITY CHARACTERISTIC](#)
- [INAPPROPRIATE USE OF METHOD 1311 \(TCLP\) AS AN ALTERNATIVE EXTRACTION PROCEDURE](#)
- [REVISIONS TO THE TCLP](#)
- [SEMI-VOLATILE CONSTITUENT ANALYSIS AND ANALYTICAL LEVEL OF DETECTION LIMITATIONS OF THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE \(TCLP\)](#)
- [ENVIRONMENTAL FACT SHEET: EPA REVISES QUALITY ASSURANCE MEASURES FOR THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE](#)

Use of Totals to Determine Whether a Solid Waste Exhibits the Toxicity Characteristic

- [USE OF TOTAL WASTE ANALYSIS IN TOXICITY CHARACTERISTIC DETERMINATIONS](#)
- [CALCULATION OF TCLP CONCENTRATIONS FROM TOTAL CONCENTRATIONS](#)
- [BIOSOLIDS](#)
- [TOTAL CONCENTRATION USED TO DEMONSTRATE A WASTE DOES NOT EXHIBIT THE CHARACTERISTIC OF EP TOXICITY](#)
- [GENERATOR USE OF TOTAL CONSTITUENT ANALYSIS IN LIEU OF THE EP OR TCLP TESTS](#)

- [TOTAL CONSTITUENT ANALYSIS TO DETERMINE HAZARDOUS CHARACTERISTICS OF WASTE SAMPLE](#)
- [TOTAL WASTE ANALYSIS ON POTW BIOSOLIDS AND CERCLA LIABILITY](#)

General Toxicity

- [RCRA HAZARDOUS WASTE DETERMINATION OF SPENT NUCLEAR REACTOR FUELS](#)
- [RESPONSE TO REQUEST FOR OPINION ON SECTION 21 PETITION ON BATTERY DEPOSITS](#)
- [NOTES ON RCRA METHODS AND QA ACTIVITIES](#)
- [QC REVIEW OF PERMIT DATA](#)
- [CLARIFICATION OF NEWLY LISTED WASTES AND HAZARDOUS DEBRIS](#)
- [DESIGNATION OF AMERICIUM BERYLLIUM SOURCES UNDER RCRA](#)
- [BATTERIES, WASTE ELECTROLYTE FROM RECHARGEABLE NICKEL-CADMIUM](#)
- [REGULATORY STATUS OF PETROLEUM CONTAMINATED MEDIA AND DEBRIS UNDER THE TOXICITY CHARACTERISTIC UST TEMPORARY DEFERRAL](#)
- [REGULATORY STATUS OF BRASS PARTICLES GENERATED IN THE BELTING AND BUFFING OF BRASS CASTINGS](#)
- [REMOVAL OF TOXICITY CHARACTERISTIC WASTES FROM A SURFACE IMPOUNDMENT](#)
- [PETROLEUM-CONTAMINATED MEDIA AND DEBRIS DEFERRAL FROM THE TOXICITY CHARACTERISTIC](#)
- [LAND DISPOSAL RESTRICTIONS \(LDR\) TREATMENT STANDARDS AND DISPOSAL OPTIONS FOR CONTAMINATED SOIL](#)
- [ELECTRIC UTILITY POLES](#)
- [TC APPLICABILITY TO MIXED WASTE](#)
- [TC RULE HAZARDOUS WASTE DETERMINATION](#)
- [SQG COMPLIANCE WITH TC RULE](#)
- [EPA'S NON-OBJECTION TO IMPORTS OF COBALT OXIDE-MOLYBDIC OXIDE SPENT CATALYSTS INTO THE U.S. FOR RECOVERY](#)
- [SLUDGES WITHIN SURFACE IMPOUNDMENTS, NEWLY REGULATED DUE TO TC RULE](#)
- [SILVER IN WASTES AND IN SEWER DISCHARGES FROM THE PHOTO-FINISHING INDUSTRY](#)