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Environmental Protection Department
Hazardous Waste Management Division

Waste Acceptance Criteria

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User's Guide

The WAC Manual

This Waste Acceptance Criteria (WAC) Manual is intended to provide guidance to LLNL's waste generators in the management of their waste as well as comply with the requirements of state and federal regulations and DOE Order 5820.2A.

The WAC Manual does not contain new information; it is a compilation of information that has previously been available in other documents and guidance materials. It covers the spectrum of waste stream management at LLNL.

The manual defines federal, state, DOE, LLNL, EPD, and Hazardous Waste Management (HWM) requirements for characterizing, packaging, and documenting waste and provides uniform acceptance criteria for its storage, transport, treatment, and disposal.

The WAC is on-line.

- external:
  http://www.llnl.gov/es_and_h/wac/wac.html
- internal:
  http://www.llnl.gov/llnl_only/es_and_h/wac/wac.html

Three Sections

Divided into three sections, the WAC Manual is a supplement to EPD's "Hazardous Waste Generation and Certification," EP0006 course. Each of the three sections begins with a table of contents that outlines the covered topics and subtopics.

Section 1.0

Introduction discusses the need for compliance and acceptance criteria for waste, defines a generator, the support services available to generators, and states the purpose of the WAC Manual.

Section 2.0

Categorizing Waste defines waste, discusses the different regulations governing waste management, the characteristics of waste, and defines specific waste streams.

Section 3.0

Waste Acceptance Criteria is divided by tabs into six subsections:

- Hazardous Waste
- Low-Level Waste
- Transuranic (TRU) Waste
- Mixed Waste
- Nonhazardous Waste
- Special Case Waste

Each of the subsections begins with a table of contents that provides easy access to information regarding the handling requirements of specific kinds of waste streams.

Information Mapping

This document takes an Information Mapping approach to its subject. Such an approach quickly directs the reader to pertinent functional information.

The Information Mapping method makes it easier to find key information by separating topics into small units based upon the readers' functional needs.

Using the WAC

Sections 1.0 and 2.0 should be studied thoroughly. However, Section 3.0 can be used selectively since the Information Mapping method allows generators to readily pick out the sections and topics that are germane to their particular waste streams.

Contents and Scope

Contents and Scope

Document Organization

This Waste Acceptance Criteria document is divided into three logical sections that will assist you in categorizing your waste.

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Section 1: Introduction

Section 1: **Introduction** discusses the purposes of this document and the responsibilities of organizations and individuals at Lawrence Livermore National Laboratory (LLNL) regarding the proper management of waste.

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Section 2: Categorizing Waste

Section 2: **Categorizing Waste**, is designed to help you categorize waste according to several broad types. The topic order corresponds to **Section 3**.

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Section 3: Waste Acceptance Criteria

Section 3: Waste Acceptance Criteria is divided into six parts that correspond to the waste topics in **Section 2**.
The six kinds of waste are as follows:

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Appendices
A – Hazardous Waste Generated at LLNL
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C – Container Selection
D – Instructions For Completing Labels
E – Guidelines to Chemical Compatibility
F – Process Knowledge Evaluation (PKE) Forms
G – Toxic Air Contaminants (TAC)
H – Sewer Systems at LLNL

Introduction

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1.0 Introduction

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1.0 Introduction

1.1 Purpose

Purpose of this document

The purpose of this LLNL Waste Acceptance Criteria (WAC) Document is to define Federal, State, U.S. Department of Energy (DOE), LLNL, and Hazardous Waste Management (HWM) Division requirements for characterizing, certifying, packaging, and documenting waste that is generated by LLNL operations.

HWM's goal

HWM, a division of the Environmental Protection Department (EPD), has developed and prepared this WAC document to help you, as an LLNL waste generator, meet all regulatory and permit requirements. Other organizations within EPD also assisted in the preparation of this document.

HWM's goal is to provide uniform acceptance criteria for waste that you send to its facilities for storage, treatment, and disposal.

Using the WAC

Proper waste identification and preparation are necessary for managing your waste safely while meeting regulatory requirements. This WAC document is designed to guide you in handling and preparing your waste in an acceptable manner.

Related issues

Related information about recyclable and reusable materials, sewerable waters, and municipal trash will aid you in waste minimization. The Pollution Prevention Group in EPD can provide further guidance on how you can minimize your waste. For information and assistance, call the Recycling Hotline at 3-2784. Also see *Guidelines for Preparing Office and Shop Supplies for Disposal* (UCRL-AR-103971).

Exceptions to the WAC

On a case-by-case basis, an exception to the criteria will be granted. All exceptions must be approved by the HWM Division Leader in writing. Each exception must include a plan to bring the waste stream into compliance or to cease its generation.

1.2 LLNL's Responsibilities

LLNL's environmental policy

An overall objective of LLNL is the sound management of environmental issues. The environmental policy of LLNL maintains that the environment, health, and safety have top priority. The Laboratory takes responsibility for and insists that operations:

- comply with federal, state, regional, and local regulations; in addition, comply with DOE and LLNL policies and procedures
- are conducted in ways that would protect the environment
- encourage waste minimization in support of DOE and LLNL initiatives.

Complying with environmental regulations

LLNL line managers are responsible for ensuring compliance with environmental regulations within their directorates.

Off-site WAC

Environmental regulations apply to off-site facilities where LLNL sends its waste for storage, treatment, reuse, recycling, and disposal. Each of those facilities has its own complex requirements; therefore, LLNL's waste must meet each of their waste acceptance criteria as well.

Lab-wide environmental compliance

The Operations and Regulatory Affairs Division (ORAD) of EPD provides day-to-day guidance on regulatory requirements for a variety of environmental concerns such as the management of hazardous or radioactive contaminated soils and media wastes, tanks, and air emissions.

1.2.1 Waste Generators

Definition

NOTICE

A generator of waste is any person whose acts or processes produce a waste. Section 2 defines the types of waste.

Waste generators are responsible for proper waste management that may include:

- identifying and characterizing waste
- selecting containers
- labeling containers
- managing the workplace accumulation area (WPAA), also sometimes called the Satellite Accumulation Area (SAA)
- transferring hazardous and radioactive waste to an approved LLNL waste accumulation area (WAA) or Consolidation Waste Accumulation Area (CWAA)
- minimizing waste to support DOE and LLNL initiatives
- seeking assistance from the Environmental Safety and Health (ES&H) Team or HWM field technician when appropriate
- complying with the requirements of the WAC.

Generator training

EPD offers training courses throughout the year to prepare waste generators for handling workplace wastes, especially hazardous wastes, safely and in compliance with environmental regulations.

These courses are required under Federal and State waste regulations, and it is up to a generator's line manager to ensure all required training is completed. HWM will not accept waste from a generator whose training is not current.

The basic hazardous waste generation course is given several times a month. Specialized low-level and transuranic waste courses are also offered as needed. The course numbers and titles are:

EP0006—Hazardous Waste Generation & Certification (one time)
EP0006-R—Hazardous Waste Generation & Certification Review (annual)
EP0021—TRU Waste Generation & Certification Program (every two years)
EP0110—Low-Level Waste Generation & Certification (every two years)

To find out about waste management courses, refer to the LLNL Course Catalog. The EPD Training Coordinator provides class schedules. In addition, basic training requirements are posted on the contents page of each section. For more course information, call the EPD Training Coordinator at 2-9236.

1.2.2 Support for Waste Generators

HWM's roles

HWM supports the waste generator by:

- developing and implementing waste handling procedures, operations, and reporting systems
- providing trained personnel to assist waste generators
- transporting waste from the WAA to an HWM facility
- tracking and documenting the movement of waste from WAAs or CWAAs to an approved final destination
- ensuring appropriate final destination of waste, i.e., treatment, storage, disposal, reuse/recycle, or reclamation
- repackaging, treating, and storing waste
- transporting some wastes
- managing the LLNL waste certification program.

Four ES&H teams assist generators

Currently, the four ES&H teams at LLNL are responsible for assisting generators with environmental, safety, and health issues.

ES&H team members consist of specialists from the Environmental Protection and Hazards Control Departments, such as:

- environmental analysts
- health and safety technicians
- health physicists
- industrial safety engineers
- industrial hygienists
- fire protection engineers
- criticality safety engineers
- explosives safety engineers
- HWM field techs.

1.2.3 Certifying Waste

What is waste certification?

Waste certification is similar to other types of certification. It compares an item (in this case, waste) to a specific set of criteria and verifies that the item meets those criteria.

As an example, in the case of low-level waste (LLW), the criteria are established by the DOE Nevada field office (DOE/NV). The Waste Certification Program (WCP) at LLNL manages the Quality Assurance (QA) program which ensures that those criteria are met. The waste generator provides information that enables the WCP to certify waste for storage, treatment, or disposal.

The reason for certifying wastes

Waste Certification is important because it assures that the waste is properly characterized and is offered for treatment or disposal in compliance with the correct Federal or State regulatory standard. In addition, Waste Certification is important because it assures that the waste being offered for treatment or disposal is compatible with the treatment or disposal technology.

Again, using LLW as an example, when it is shipped to the Nevada Test Site, it will be disposed of by shallow land burial. Only specific types of low-level radioactive waste are suitable for this type of disposal.

Certification is also required to demonstrate that the waste contains no hazardous materials this is required so that LLW can be removed from LLNL's storage facilities and transported to specially prepared off-site storage and disposal facilities for radioactive waste.

Shipping certified LLW off-site increases on-site storage space for other wastes and reduces the potential of on-site environmental accidents.

1.2.4 Resources Available to Generators

Hotlines and On-line Documents

On the next two pages you will find some General Information Hotlines and General Information HomePages that provide information that can help you with fulfilling your responsibilities.

General Information Hotlines

Organization	Phone	Hours	Reason
ChemTrack	4-4404	8:00–5:00 p.m.	To report a chemical container without a bar code or purchased chemical using Procard
CHEW	4-5055	8:00–4:30 p.m.	To locate desired chemicals or to send excess chemicals
Pollution Prevention	3-2784	8:00–5:00 p.m.	Questions or suggestions for reuse, recycling, and recovery activities
EPD Training	2-9236	7:30–4:30 p.m.	Information regarding EPD training courses
HWM	3-1996	7:45–12:00 p.m. 1:00–4:30 p.m.	HWM personnel points of contact
MSDS Hotline	3-2122	8:00–4:30 p.m.	To request copies of MSDSs for common chemicals

General Information HomePages

Organization	WWW Address
Environmental, Safety & Health	http://www.llnl.gov/llnl_only/es_and_h/esh.html
Environmental Protection Department	http://www.llnl.gov/epd
Environmental Compliance Manual	http://www.llnl.gov/llnl_only/es_and_h/ecm/toc/toc.html
Waste Acceptance Criteria	http://www.llnl.gov/llnl_only/es_and_h/wac/wac.html
ChemTrack	http://www-erd.llnl.gov/orad_only/ppg_pages/capabilities/recycling/chem_track/chem_track_flyer.html
CHEW	http://www-erd.llnl.gov/orad_only/ppg_pages/capabilities/recycling/chew/chew_flyer.html
Recycling	http://www-erd.llnl.gov/orad_only/ppg_pages/capabilities/recycling/recycling_llnl/recycling_llnl.html
EPD Training	http://www-erd.llnl.gov/epd_training

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Categorizing Waste

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2.0 Categorizing Waste

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2.0 Categorizing Waste

Overview

Waste defined

Waste is any substance that has been discarded, has served its intended use, or is an unusable manufacturing by-product. Waste also includes material in damaged containers that is not repackaged and material in an unlabeled container. Waste has many names: rubbish, trash, debris, garbage, refuse, etc. The kind of waste we deal with at LLNL can be called all those names.

It can't be reused or recycled at the site of its generation, so it is the by-product of the activities taking place in the research labs, fabrication shops, maintenance shops, offices, and other workplaces at LLNL. Certain wastes, e.g., used oil, have other disposal options. Check with your environmental analyst for assistance.

Examples of waste generated at LLNL include spent solvents, products that have exceeded their shelf life, used radioactive scintillation cocktails, material in damaged containers that is not repackaged, material in unlabeled containers, and absorbent used to clean up waste or product spills.

Chemical or product recycling

When you no longer have use for a chemical, please consider offering it to HWM's Chemical Exchange Warehouse (CHEW) instead of declaring it waste. The CHEW Tech will pick up your good chemicals, temporarily store them, list them on a lab-wide database, and deliver your chemicals to someone who will use them productively. Unopened and opened containers are accepted.

Almost any chemical (hazardous and nonhazardous) is accepted if it is pure, in the original container, the container is clean, and the chemical is safe for HWM to handle. This process takes less effort for the generator than declaring a chemical a "hazardous waste." It is also environmentally friendly and saves money for LLNL. For further details, contact your HWM field tech, or check the resources available in Section 1.2.4.

Processes that produce waste

A large portion of LLNL's waste is generated in fabrication and maintenance shops and offices.

The waste generated in research laboratories is from use of chemicals, reagents, and soiled solid lab waste. In addition, waste may be generated from spill cleanup and decontamination.

2.1 Hazardous Waste

Definition

Hazardous waste is that which is determined by the U.S. Environmental Protection Agency (EPA) or by the State of California to be hazardous and poses a danger to public health, safety, or the environment.

Federal regulatory framework

The Federal regulatory framework for defining and managing hazardous waste is the Resource Conservation and Recovery Act (RCRA).

RCRA (40CFR Parts 260-272) was enacted in 1976 to establish a program to regulate the management of solid and hazardous wastes from "cradle to grave."

State regulatory framework

The State regulatory framework for defining and managing hazardous waste is the California Hazardous Waste Control Law (HWCL) enacted in 1977 and amended several times.

The management of hazardous waste under HWCL and related California Code of Regulations (Sections 66260-66266, 66268, and 66270) is enforced by the California Department of Toxic Substances Control (DTSC).

DTSC implements and enforces RCRA

Every state must comply with RCRA. States can be granted authority to administer RCRA if State regulations are as stringent as the Federal regulations.

EPA authorized DTSC to implement and enforce its own RCRA program in California which is at least as stringent as federal RCRA. As a consequence, the California Hazardous Waste Control Law must be followed at LLNL.

DTSC representatives conduct periodic on-site inspections to verify compliance with State and Federal waste regulations.

List of hazardous wastes

NOTICE

To help you determine if you have generated a hazardous waste, refer to **Appendix A**, which contains a list of hazardous wastes that are commonly generated at LLNL.

If your waste is on the list, then you have generated a hazardous waste. To be certain, check with your environmental analyst.

Characteristics of hazardous wastes

NOTICE

If your waste is not on the list, then you must determine if the waste exhibits any of the following characteristics:

- ignitability
- corrosivity
- reactivity
- toxicity.

If the waste exhibits any of these characteristics, then you have generated a hazardous waste (see Section 3.1). Your environmental analyst and HWM field tech can help you further identify the hazardous characteristics of your waste.

Complexity of characterizing waste

Characterizing hazardous waste is a complex process. The consequences of incorrectly characterizing hazardous waste can be very serious, both to your health and the environment. If your waste is incorrectly characterized, LLNL is subject to fines of up to $25,000 a day levied by state and federal enforcement agencies.

When waste is nonhazardous

If the waste is not on the list, does not exhibit any of the above characteristics, or your environmental analyst or HWM field tech advises you that it is not hazardous, then it should be managed as nonhazardous waste.

2.2 Low-Level Waste

Waste containing low levels of radioactive components

NOTICE

Low-level waste (LLW) contains radioactive components that do not meet the definition of transuranic waste (Section 2.3) and does not contain components deemed RCRA hazardous (Section 2.1) (One exception though, is lead used solely for shielding purposes).

LLW can contain waste contaminated with low-level radioactive components and California hazardous constituents solely regulated by DTSC, not RCRA. At LLNL, a common example of this is beryllium or oil contaminated with radioactive components.

2.3 Transuranic (TRU) Waste

TRU waste defined

NOTICE

Transuranic (TRU) waste is solid waste that is contaminated with alpha-emitting transuranium radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries of alpha activity per gram (100 nCi/g) at the time of assay. A TRU radionuclide is any radionuclide having an atomic number greater than 92. These definitions are in DOE Order 5820.2A.

Waste containing TRU radionuclides and constituents regulated as California-only hazardous waste (non-RCRA) should be labeled as radioactive waste and with the California hazardous constituents listed on the label. At LLNL, a common example of this is TRU waste contaminated with beryllium or oil.

Waste contaminated with TRU radionuclides only or with TRU radionuclides and hazardous constituents solely regulated by DTSC (non-RCRA) is not mixed waste, but TRU radioactive only.

TRU waste also contaminated with RCRA-regulated hazardous constituents is covered in Section 2.4, Mixed Waste.

2.4 Mixed Waste

Low-level mixed waste

Low-level waste that contains at least one other component that meets RCRA's definition of a hazardous waste is considered mixed waste. Such a waste may be solid, liquid, or gas. Disposal options for it are extremely limited, so please try to minimize generation of this type of waste stream.

TRU mixed waste

NOTICE

TRU waste that also contains a RCRA-regulated constituent is considered TRU mixed waste. Only solid TRU mixed waste can be accepted by HWM. The only hazard characteristic acceptable for disposal is toxicity. Waste contaminated with ignitables, corrosives, or reactives must be treated to remove these characteristics. Since treatment and disposal options for such waste are extremely limited and costly, it is highly advisable this type of waste not be generated. If a proposed experiment or process may yield TRU mixed waste, please consult with the Pollution Prevention Group before starting.

2.5 Nonhazardous Waste

Nonhazardous industrial waste

Industrial wastes, such as retention tank waters, can contain RCRA hazardous constituents that are below threshold regulated hazardous waste limits but exceed those limits which are permissible for discharge to the sanitary sewer under the Livermore Water Reclamation Plant (LWRP) permit or municipal landfills.

Retention-tank waters with concentrations of constituents that are not high enough to be classified as hazardous but exceed permissible limits in the LWRP permit cannot be discharged into the sanitary sewer system because of restrictions promulgated by the City of Livermore Sewage Treatment Plant.

Non-sewerable wastewater is either shipped off site as nonhazardous or treated on site so that it meets internal sewer discharge limits.

Nonhazardous municipal waste

Nonhazardous municipal waste is not managed by HWM. Such waste includes non-recyclable paper and cardboard, food and food packaging materials, wastebasket trash, and other nonhazardous items that can be disposed of in a municipal landfill. These wastes are managed by the custodial personnel. Recyclable paper and cardboard are managed through the Pollution Prevention Group in EPD, extension 3-2784.

2.6 Special Case Waste

Conditional waste

NOTICE

Conditional waste is so named because it or its packaging may need to be checked or modified to meet specified conditions prior to acceptance at LLNL's main site HWM facilities. It has special handling and packaging requirements to meet the acceptance criteria. Your environmental analyst or HWM field tech can help you manage these special requirements.

Examples of conditional waste include:

- accountable materials
- classified waste
- fluorescent tubes & ballasts
- fuming acids
- gas cylinders
- HEPA filters
- medical wastes
- animals
- nitric acid
- peroxide forming materials
- PCBs
- scintillation cocktails
- sewer waste
- shielded items.

Unacceptable wastes

The following categories of waste cannot be accepted at HWM facilities:

- wastes that are reacting or releasing hazardous constituents at a rate that would render them unsafe to store or transport
- explosives
- most commercial vendor-supplied compressed gases (unless the vendor will not pick up the cylinder)
- wastes from generators who have not completed required waste management training
- improperly packaged waste or waste in damaged containers
- wastes with incomplete or improper labels or requisition forms
- extremely hazardous or acutely toxic wastes that exceed allowable quantity limits per container, as specified by HWM's internal safety analysis policies
- wastes that cannot be identified or that are incompletely characterized
- radioactive waste that exceeds allowable activity limits per container:
  - 6 alpha curies per container of TRU*
  - 1,000 or more curies per container of tritium**
  - 120 or more grams of fissile material in a 55-gallon drum, not including uranium-235 that is part of natural or depleted uranium
- waste that cannot be certified for final disposition, i.e.:
  - waste that has no disposal/treatment option
  - waste that does not meet the WAC of the intended disposal facility.

* HWM is arranging alternative storage facilities to accommodate legacy wastes that exceed this limit. However, it is preferable that new wastes be packaged to meet the 6 alpha curie limit. Contact your HWM technician for more information.

** 1,000 curies of tritium is the limit for transportation in standard containers. For waste containing >1,000 and <5,000 curies, contact your HWM technician.

Waste Acceptance Criteria

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Waste Acceptance Criteria

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3.0 Waste Acceptance Criteria

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Introduction

Section 3 contains seven subsections that describe the waste acceptance criteria specific to the various categories of waste and special criteria for wastes which require special handling. Each of the first six sections is broken up into three general areas:

- characterization information; describing the various ways available to characterize wastes
- documentation information; describing the various forms needed and the reasons for their use
- waste preparation information; describing the packaging requirements and steps to take to properly transport, store, treat, and dispose of wastes.

The subtopics discussed in each area differ slightly because the requirements in each area vary by waste category.

The information in Special Case Waste is much more specific and contains a level of detail that exceeds the guidance in the general sections.

The criteria contained herein is intended to meet the requirements of DOE Order 5820.2A for radioactive waste and the internal waste acceptance requirements of the Hazardous Waste Management Division for all waste.

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3.1 Hazardous Waste

Topic	Subtopic
3.1.1 Characterization **Pages 37 - 45**	• *Process Knowledge* • *Tools for Characterizing Hazardous Waste* • *Sampling and Analysis*
3.1.2 Documentation **Pages 46 - 49**	• *Waste Disposal Requisition (WDR)* • *Waste Evaluation Form (WEF)* • *Material Safety Data Sheet (MSDS)* • *Confirmation of RMMA Status* • *WDR Sign-off; WEF Sign-off*
3.1.3 HazardousWaste Preparation **Pages 50 - 55**	• *Packaging* • *Labeling* • *Segregating* • *Storage Time Limits* • *Transfer to WAA or CWAA* • *Approval Process*

Training Requirement: As a generator of hazardous waste at LLNL, you are initially required to take the training course EP0006, *Hazardous Waste Generation and Certification*, and thereafter, you must annually complete the training course EP0006-R, *Hazardous Waste Generation & Certification Review*.

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3.1.1 Characterization

Process Knowledge

NOTICE

Hazardous wastes that are generated at LLNL can be primarily characterized by the waste generators through their knowledge of the process that generated the waste.

To help determine if you have generated a hazardous waste, see page 38, Tools for Characterizing Hazardous Waste.

Approval of this type of waste must be obtained from the Characterization Chemistry Team of the HWM Waste Generator Services Group prior to acceptance into an HWM facility.

Sampling and analysis

NOTICE

If the above methods are not adequate for characterizing your waste, you must arrange to have your waste sampled by the HWM Field Technician or Sampling Team from Waste Generator Services and analyzed by the Chemistry & Materials Science—Environmental Services (CES) Lab. An environmental analyst or HWM field tech should be contacted for assistance.

Waste must be fully characterized before it can be transported to an HWM facility. Your characterization will allow HWM to safely handle, segregate, store, treat, and dispose of the waste according to its operating permit requirements. See "Sampling and Analysis" on page 43 for use of the CES Chain of Custody and Analytical Instructions (COC).

Verification

Approximately ten percent of all incoming waste may be randomly selected to be verified through visual inspection or analysis. Additionally, ten percent of waste shipped from consolidation Waste Accumulation Areas (WAAs) directly off site is verified.

Tools for Characterizing Hazardous Waste

EPA and California DTSC lists of hazardous waste as well as knowledge of the hazardous properties of your waste can be used as tools for chracterizing your waste.

Using lists

The EPA has divided hazardous wastes into a number of lists. In addition, California's DTSC has its own list of hazardous wastes.

For your convenience HWM has combined the EPA and DTSC lists into a single alphabetized list located in **Appendix A** where the following information is provided for each waste:

- whether the waste is EPA or DTSC listed, or is on both lists
- the EPA waste code
- the hazardous characteristics causing the waste to be listed
- whether the waste is acutely or extremely hazardous.

Using characteristic properties

If the hazardous components of your waste are not on these lists, then determine if it exhibits any of the four hazardous properties as defined by EPA or DTSC and summarized on the following pages:

- ignitable
- corrosive
- reactive
- toxic.

Ignitable characteristics

Ignitable wastes may be:

- ***liquids*** (other than a water solution containing less than 24% alcohol by volume) with a flash point of less than 60°C (140°F)
- ***nonliquids*** that can spontaneously burn or can be ignited by friction or absorption of moisture at ambient conditions.
- ***compressed gases that burn***.
- ***anything solid that burns*** in the presence of oxygen in the atmosphere and that releases large quantities of energy. Strong oxidizers almost always contain multiple oxygen atoms.

Examples of ignitable wastes include:

- alcohol (>24% by volume as defined by law)
- finely powdered iron, nickel and aluminum
- benzoyl peroxide
- potassium nitrate.

Corrosive characteristics

Corrosive wastes may be liquids, gases, or solids that exhibit any of the following properties:

- aqueous with pH ≤ 2 or ≥ 12.5
- a liquid that corrodes steel at rates exceeding 0.25 inches per year at a test temperature of 130˚F using a specified test method
- solid wastes meeting either of these criteria when mixed in equal parts with water.

Examples of corrosive wastes include:

- acid solutions (pH ≤ 2)
- alkaline solutions (pH ≥ 12.5)
- ferric chloride solution
- caustic alkaline solids.

Reactive characteristics

Reactive wastes may be liquids, gases, or solids that exhibit any of the following properties:

- reacts violently with water
- forms potentially explosive mixtures with water
- normally unstable and readily undergoes violent change without detonating
- generates toxic gases, vapors, or fumes in a quantity sufficient to present a danger to human health or the environment when mixed with water or another chemical, such as acid.

Examples of reactive wastes include:

- hetero-nitro (containing multiple nitro groups)
- lithium hydride
- sodium metal
- cyanide- or sulfide-bearing wastes which evolve toxic cyanide or sulfide gases when exposed to a change in pH between 2 and 12. 5
- waste with a cyanide concentration of >250 parts per million or a sulfide concentration of >500 parts per million which evolve toxic cyanide or sulfide gases when exposed to acidic conditions of pH <2.

Toxic characteristics

Toxic wastes may be gases, liquids or solids that exhibit any of the following properties:

- carcinogenicity, mutagenicity, or teratogenicity
- acute or chronic health effects.

Waste is deemed toxic if it exhibits any of the following criteria:

- contains specific hazardous constituents above specified regulatory limits
- is toxic to test animals by a oral, dermal, or inhalation route
- is toxic to aquatic life
- contains specific carcinogenic materials above the regulatory limits.

This toxicity characteristic can be determined by analytical measurements of concentrations of the toxic material that are:

- dissolved in a liquid waste
- leachable by acidic water (pH 5) from a solid waste
- a combination of the above.

Examples of toxic wastes include:

- water soluble compounds of listed heavy metals such as nickel or silver
- listed chlorinated and nonchlorinated solvents such as trichloroethylene and toluene
- listed pesticides such as Chlordane
- coolants with or without listed metals or oil
- waste oil (CA-only hazardous waste).

Sampling and Analysis

Sampling and analysis performed by HWM may be required as an alternative tool.

Chemistry & Materials Science—Environmental Services (CES) Lab

NOTICE

If you are unable to determine if the waste meets the criteria for a listed waste or exhibits a hazardous characteristics using the process characterization method, then you need to arrange for it to be sampled and analyzed. HWM will arrange for the sampling and CES will do the analyses.

Your HWM field tech will provide assistance to determine the type of analysis required to characterize your waste and provide guidance on characterization procedures for unknown wastes.

CES Chain of Custody and Analytical Instructions (COC)

NOTICE

If your waste requires analysis, and if you are not in a full service area, you are responsible for requesting that it be sampled and analyzed.

Your HWM field tech will assist you in filling out a COC, taking samples, and arranging for the appropriate analysis. The environmental analyst determines what analyses to request.

Within 30 days, HWM should receive the results of the analysis. The results are recorded on the WDR and then entered into a computerized tracking system managed by HWM.

The field technician attaches the results of the analysis to the WDR. Contact your HWM field tech for a copy of the results.

Following is an example of a COC. (The most current version of CES forms, plus other information, can be found at the CES web site located at http://www-cms.llnl.gov/ces/. The forms are located in “QA Documents.”)

COC Version 2.0 2/21/97

CES Chain of Custody

Send Results to: _____

L- _____ phone _____

Copy: _____

L- _____

Turnaround Time

☐ E

☐ R

☐ N

Field Contact _____

LLNL Account # _____ - _____

Project Name/DQO _____

Tank Volume _____ liters

Issue Reports ☐ COC ☐ Sample

Data Package Required: ☐ Normal ☐ CLP

Client ID _____

FOR CES USE ONLY

Condition Upon Receipt: ☐ No Discrepancies

☐ Condition/Variance _____

Client Sample Identification	Date Sampled	Time Sampled	Bldg	RAD (Y or N)	Matrix Code	Geo Code	# Bottles	Tests / Preservation Codes									Additional Instructions: Sample Composition
1																	
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

	Signature	Date	Time		Signature	Date	Time
Relinquished by:				Received by:			
Relinquished by:				Received by:			
Relinquished by:				Received by:			

CES phone # (510) 424-4127 ELAP Certifications #1554 See page 2 for codes and additional instructions

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version. *http://www-ems.llnl.gov/llnl_only/ces/QA_docs/List_of_QA_Docs.html*

	COC **Version 2.0** **2/21/97**	**CES Chain of Custody Instructions**

1. **Turnaround Time** section - Normal (N) = 15 work days; Rush (R) = 6 work days and Emergency (E) = 2 work days. Berms are due close of business the following day.
2. **Field Contact** section - name of individual to contact in case there are questions about the requested tests or sample bottles.
3. **Tank Volume** - volume of liquid in the tank when sampled; not the capacity of the tank.
4. **Issue Reports** section - check **COC** to receive all of the results from all the samples on a COC together. If **Sample** is checked, results from individual samples will be returned as completed. When submitting separate samples for top and bottom waste phases, check **COC** box to ensure HWM receives reports for both the top and bottom phases at the same time.
5. **Building** column - enter the building that the waste originated from. This field is used to determine if the waste is from an RMMA. If the sample is rad or potentially rad, CES will screen the sample for radioactivity.
6. **Sample Rad? Y/N** - for radioactive or potentially radioactive samples, enter **Y**.
7. **Matrix Code, Generation Code, Preservation Code** and **Test Codes** are given below. The current list of CES Codes is available on the Internet at : *http://www-cms.llnl.gov/ces* and at the CES Log-In Desk.

MATRIX CODES		GENERATION CODES		PRESERVATION CODES	
AQ	Aqueous	**WS**	Waste	**N**	No preservative
PC	Photochemicals	**EV**	Environmental	**R**	Refrigerated (4±2°C)
CO	Coolant	**FQC**	Field QC	**A**	HNO_3 (**RED** tape)
SV	Solvents	**WV**	Waste Verification	**B**	NaOH (**WHITE** tape)
OI	Oils	**CRT**	Categorical Retention Tank	**S**	H_2SO_4 (**YELLOW** tape)
ZZ	Other Liquid Waste	**NRT**	Non-categorical Retention Tank	**C**	HCl (**BLUE** tape)
SL	Sludge	**TT**	HWM Treatment Tank	**T**	$Na_2S_2O_3$ (sodium thiosulfate)
SO	Soil	**PE**	Performance Evaluation	**F**	Frozen
CD	Construction Debris	**QC**	Quality Control	**H**	Hexane
SW	Swipe			**M**	Methanol
XX	Other Solid Waste			**W**	Water
				E	Acetonitrile

WET CHEM/misc.		ORGANIC		METALS		RAD	
Rad Screening	CES only	601/602	E601+602	TTLC-metals	TTLCMA+K	GAB	RADWG:GA+GB
Low Rad Screening	CES only	624	E624		TTLCMB+K	Tritium	RADWG:H3
pH	E9040/E9045	625	E625	TTLC-Hg	TTLCMA+K	Gamma Spec	RADWG:GS
pH/norm	pH+normality	8021	E8010+8020		TTLCMB+K	Alpha TUPA	AS:AMISO,PUISO,THISO, UISO
Normality	E305.1/E310.0	8015	E8015	STLC metals	STLCMA+K	GAB-Swipe	RADWG:GA+GB
pH/norm-R'T	pH+normality	8260	E8240+P113		STLCMB+K	Tritium Swipe	RADWG:H3
Flashpoint	FLASHPT	8270	E8270	STLC-Hg	STLCMA+K	Gamma-Swipe	CES only
Anions	ANIONS	8290	E8290		STLCMB+K	Carbon-14	CES only
Cyanide	E9C10	8080	E8080W:PCB	TCLP-metals	TCLPM+K	Phosphorus-32	CES only
Sulfide	E9C30	WVorg	CES only	TCLP-Hg	TCLPM+K	Chlorine-36	CES only
Percent Oil	CES only	HMX/RDX	E8330:HE			Field Gamma	CES only
ppm Oil	E9C70/E9071	TATB	E8330:HE			Rad Dec.	CES only
Percent Water	E160.3/PM	TNT	E8330:HE	*MA & MB*			
TS	E160.3	TCLP-Vol	TCLPV	*Refer to Enc. A*			
TDS	E160.1	TCLP-Semi	TCLPSV	*for specific DLs.*			
TSS	E160.2						
TOC	E9C60						
Fish Toxicity	FISHTOX5C						

8. **Tests** section - enter test code in vertical rectangle and then enter a **Preservative Code** for a given sample. The Preservation Code indicates that a test is requested and records the preservation of the sample bottle. For example: to request TTLC metals for a set of samples preserved with nitric acid, enter TTLC-metals in the vertical rectangle and then enter A in the column underneath the test for every sample that requires TTLC-metals.
9. **Sample Composition** - enter for each sample. If more space is needed, several lines may be used for one sample. For complex waste samples, attach a copy of the HWM Waste Requisition or TWMS form to assist CES in safely handling the waste sample.

For document control purposes, user SHALL ensure that all working copies are identical to current electronic version.
http://www-cms.llnl.gov/llnl_only/ces/QA_docs/List_of_QA_Docs.html

Sampling methods

Provide the sampling personnel as much information about the composition of your waste as possible. This exchange is important because, before collecting the sample, the sampling or field technician will select a sampling method and strategy that is safe and appropriate for the waste.

There are several sampling methods for the various kinds of waste. The sampling method and device used to sample a container of waste depend on the generator-supplied information based on knowledge of the waste.

3.1.2 Documentation

Waste Disposal Requisition (WDR)

The WDR form is a document in which you transmit required information to HWM so that they can properly manage your waste. It is also an important internal tracking device which assures that HWM meets its "cradle-to-grave" waste tracking responsibilities.

Before you remove your waste from your workplace, a WDR must be completed.

Source Codes define the process that created your waste (see **Appendix B**). Choose the one that best describes your process. If you need help, contact your HWM field tech or your environmental analyst.

In addition, information must be provided regarding the creation and processes associated with waste generation. This information should be on the WDR, or attached as necessary.

You have the responsibility for completing the WDR as soon as your waste is ready for removal. Your HWM field tech can assist you in filling it out.

Detailed information and instructions on how to fill out WDRs are in **Appendix B**. When necessary, ask your HWM field tech for clarification.

Waste Evaluation Form (WEF)

All routinely generated hazardous waste must be documented on the Waste Evaluation Form (WEF), which can be found in **Appendix F** along with instructions for filling it out. The WEF is completed by HWM with information supplied by the generator. The generator signs the WEF usage card signifying the information, as stated, is correct. The WEF is used to profile preapproved waste streams. The WEF will be available electronically and if you have a preapproved waste stream, it will be used to expedite the process of filling out your waste disposal requisition. Consult your HWM technician for information about the WEF.

Toxic air contaminants

If you have generated a hazardous waste, review the Toxic Air Contaminants list (TAC) in **Appendix G.** On the Waste Disposal Requisition (WDR), list any of these compounds present in your waste and note them as TAC in parentheses after the chemical, and estimate the percentage or concentration of the compound.

Material Safety Data Sheet (MSDS)

Occupational Safety and Health Administration (OSHA) regulations require that manufacturers, importers, and employers adhere to its Hazard Communication Standard (HCS) to inform employees of the existence of risks of exposure to hazardous substances in the workplace.

Commonly referred to as the "workers right to know," the HCS requires that Material Safety Data Sheets (MSDSs) be distributed to the users of chemicals or other hazardous substances.

There is an MSDS for individual chemicals or mixture of compounds produced. An MSDS is a basic source of information about hazardous chemicals. Each MSDS must list several characteristics of the chemical including:

- chemical identity as used on the container label
- chemical and common names of all hazardous ingredients
- physical and chemical characteristics of the hazardous ingredients
- physical and health hazards of the hazardous ingredients, including exposure symptoms
- OSHA permissible exposure limit (PEL) and other exposure limits.

An MSDS is a useful tool in helping to characterize surplus manufacturers' products because they should contain detail regarding hazardous components, physical data, ignitability, reactivity, health hazards, etc. However, if the product has been mixed or contaminated with other materials, the MSDS information may not apply.

Contact your ES&H Team environmental analyst or HWM field tech if you cannot locate an MSDS. Keep all MSDSs for product material you replace for use in disposal of your waste.

Confirmation of Radioactive Materials Management Area (RMMA) status

NOTICE

LLNL has designated Radioactive Materials Management Areas (RMMAs) as locations where radioactive contamination of a waste can occur. A list of RMMAs is maintained by Hazards Control.

Hazardous waste from a RMMA must be certified to have no added radioactivity. This can be certified by the generator or shown by analysis for radioactivity not to exceed the limit of sensitivity of established criteria (see UCRL-AR-109988).

If your hazardous waste was generated in a room or lab that is an RMMA, two critical questions on the WDR must be answered:

- Was the waste kept isolated from any operation that could have produced radioactive contamination?
- Was the waste exposed to particle beams capable of inducing radioactivity by activation?

If the answer to the first question is *yes* and the answer to the second is *no*, your signature certifies that the statements you made are correct and your waste contains no radioactive components.

If the answer to the first is *no* or the second is *yes*, then an analysis for radioactivity is required. If the analysis shows that your waste is radioactive, check the appropriate box on the WDR indicating that the waste is radioactive or mixed.

Intentionally falsifying information on the WDR or WEF could result in serious legal ramifications and poor DOE performance ratings, whose causes can be traced to the waste generator.

When an RMMA room or lab status changes

NOTICE

When a lab or room changes status from an RMMA to a non-RMMA (or vice versa), HWM requires you to immediately package and remove existing hazardous or radioactive waste. Follow container sealing procedures, fill out the WDR, and have the waste removed to the WAA or CWAA.

Timely implementation of this procedure reduces errors in identifying hazardous or radioactive wastes and avoids unnecessary analyses and confusion over waste status.

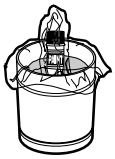
WDR Sign-off; WEF Sign-off

If you check *no* in the box on the WDR that asks if your waste was generated in a room or lab that is a Radioactive Materials Management Area (RMMA), then your signature certifies that the statements you make are correct and your waste contains no radioactive components.

Waste that has not been contaminated by radioactive materials must be so certified in order to be treated, reused, recycled, transported, stored, or disposed of as hazardous or nonhazardous waste. By signing an LLNL Waste Disposal Requisition (WDR) or WEF usage card, a generator is *certifying* that to the best of his or her knowledge the information provided on the WDR or WEF is correct.

3.1.3 Hazardous Waste Preparation

Packaging



Packaging your waste in the proper container ensures that you avoid dangerous situations.

You must not put incompatible wastes into the same container or put waste into a container that may be incompatible with the waste. Such activities can cause dangerous fumes or explosions, or cause the container to deteriorate and leak.

When selecting containers, take into account the following guidelines:

- Use separate containers for nonhazardous, hazardous, radioactive, mixed, and medical wastes.
- Use separate containers for liquid, solid, and gaseous (pressurized) wastes.
- Select a container that is compatible with the properties of all the wastes (including any reaction byproducts) that will be placed in the container; e.g.,
  - do not put corrosive wastes in unlined metal containers,
  - do not put chlorinated solvents in carboys.

All containers need to be approved by LLNL's Hazardous Materials Packaging and Transportation Committee (HMPT). Generally, all packaging materials provided through Stores or HWM have been approved by the HMPT committee.

For routine waste, the LLNL approved container will be found on the WEF.

A table in **Appendix C** lists the size and composition of the various approved containers. The types of waste that can be placed within containers are also described.

Your HWM field tech can also advise you on the type and size container to use, what wastes can be combined in a container, what wastes need to be segregated from each other, and what kind of packaging materials to use within the container.

Liquid waste

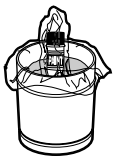
Pack liquid waste in separate containers from solid waste and gaseous waste. No liquids, including liquids already packaged in containers, may be packed in a waste drum containing solid waste and that is marked *SOLID WASTE.*

Packing small containers

If you have numerous small containers (e.g., 1-liter bottles) that are compatible with each other, they should be overpacked in a larger DOT overpack container. Each individual container must be labeled with its contents.

Place absorbent in the bottom of the overpack container, put the smaller containers on top of the absorbent, put absorbent around and on top of those containers, and seal the overpack container. At a minimum, use enough absorbent to absorb the contents of the largest container in the overpack. The absorbent must be compatible with the waste in the container. Reference **Appendix E** for more details.

Selecting a container for aerosol cans



Aerosol cans, compressed gases, and pressurized liquids should be packaged separately from other wastes. Do not remove the nozzles from aerosol cans unless they are designed to be completely removed.

If it is available, put the plastic protector cap back on the can. Waste aerosol cans should be packed in containers that are less than or equal to 5 gallons. Because of the danger of explosion, do not fill 55-gallon drums with aerosol cans.

Micro-Dusters and other similar types of aerosol cans with completely removable nozzles are generally considered nonhazardous, if empty, and may be disposed of as nonhazardous waste in accordance with the empty container regulations.

Containers for nitric acid

For concentrated nitric acid and other similar wastes, put the wastes back in their original glass containers, and place them in their original foam packaging.

All **nitric acid solutions**, pH <3, regardless of concentration, in containers of larger than 5 gallons and which do not contain hydrochloric or sulfuric acid, must be packaged in stainless steel UN 1A1 drums.

Labeling

NOTICE

Federal and State regulations require that all hazardous waste containers be labeled.

Labels can be obtained from your HWM field technician. The label should be filled in and affixed to your container as soon as you begin adding waste to it. Be sure to immediately enter the workplace start date. The label should be updated as needed every time waste is added.

Be sure the label is filled out legibly, accurately, and is clearly visible on the container. Incomplete labels or inaccurately labeled waste containers are out of compliance with regulations and cannot be accepted at the WAA, CWAA or HWM.

Strike-throughs are not allowed on the label. If changes are necessary, remove the label from the container and start over with a new one. Do not place a new label over the old one.

Appendix D contains examples of the labels that must be affixed to waste containers. Note how each one is filled out.

If you have questions, please contact your HWM field tech or environmental analyst.

Segregating

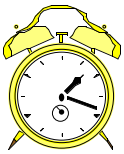
NOTICE

All waste should be segregated by:

- **chemical properties** – Wastes with incompatible chemical properties that could react with each other, such as strong acids and strong bases, should be placed in separate containers and kept in separate spill containment areas.
- **waste type** – Hazardous waste should be segregated from low-level radioactive, mixed, TRU, medical, and nonhazardous wastes. In addition, solids, liquids, and gases (aerosols or gas cylinders) should be placed in separate containers and kept in separate spill containment areas.

Based on HWM operational needs, your HWM field tech may suggest other segregation configurations.

Storage Time Limits



State hazardous waste regulation and federal RCRA requirements limit the time you may store your waste in the WAA or CWAA prior to sending the waste to a Treatment, Storage, Disposal Facility, such as HWM. Since waste is required to be transferred to HWM within one year from the initial date of accumulation, or 90 days from the date that the container was filled, LLNL practices the following hazardous waste storage limit policy:

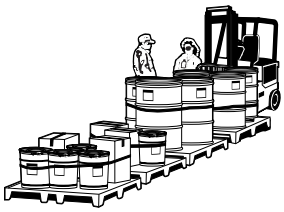
- In the workplace or satellite accumulation area, the maximum waste accumulation time is 9 months or the time it takes to fill a 55-gallon container with hazardous waste (or a 1-quart container with acutely hazardous waste – See Appendix A), whatever comes first. The waste container must then be sealed, the workplace end date needs to be written on the label, and the container is required to be transferred to the WAA, CWAA or HWM within 3 days.

- In the WAA or CWAA, the maximum waste storage time is 90 days. This ninety-day clock begins with the workplace end date, since the time period is counted from the time the container quantity limit was reached.

- In the HWM TSDF, waste may be stored for up to an additional year.

Please note that waste being accumulated in the workplace accumulation area needs to be monitored by the operator of the process generating the waste. If you have any questions, please contact your HWM field tech or environmental analyst.

Transfer to WAA



Before your hazardous waste can be moved to a WAA or CWAA, you should check to see that the following have been taken care of:

- you as the generator have characterized the waste to the best of your knowledge on the WDR and the WEF
- the waste is in a suitable, properly sealed container
- the container is clean and free of external contamination
- the proper label has been completely and accurately filled out and affixed to the container
- the WDR has been filled out and signed by you, the generator
- the WEF has been filled out and signed by you, the generator
- the WDR is submitted to HWM for approval
- if analysis is needed, a COC has been filled out
- an MSDS is included for unused and spent manufactured chemical product waste.

If sampling is required, it will be done after the container is closed on the “workplace end date” and in the appropriate location.

Please note: no additions can be made to the container after closing.

Contact your HWM field tech to review the container and its associated paperwork.

Approval Process

Contact your HWM field tech so that you can jointly complete the paperwork process. Your HWM field tech will check the waste package to ensure that the waste has been put into the proper container, is correctly labeled, and the required information has been included on the WDR or if any sampling and analysis is required.

The HWM field tech will process the waste documentation package through HWM. You will be notified by the field tech if there are any discrepancies that need to be corrected. When the waste documentation package is approved, a copy will be returned to you.

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3.2 Low-Level Waste

Topics	Subtopics
3.2.1 Characterization **Pages 59 - 67**	• *Low-Level Waste (LLW) Defined* • *Process Knowledge* • *Sampling and Analysis* • *Radionuclide Determination and Reporting* • *Exempt Radionuclides* • *Radionuclide Quantification* • *Examples of Assay Methods* • *Criteria for Waste Acceptance*
3.2.2 Documentation **Pages 68 - 71**	• *Documentation Package* • *Waste Disposal Requisition (WDR)* • *Waste Parcel Card (WPC)* • *Fill Record*
3.2.3 Waste Preparation **Pages 72 - 84**	• *Packaging* • *Additional Requirements for Solid LLW* • *Additional Requirements for Solid LLW* • *Labeling* • *Segregating* • *Transfer to WAA* • *Approval Process*

Training Requirements: You are initially required to take the training course EP0006, *Hazardous Waste Generation and Certification*, and thereafter, you must annually complete the training course EP0006-R, *Hazardous Waste Generation & Certification Review*. You are also required to take the training course EP0110, *LLW Generation and Certification* (every two years).

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3.2.1 Characterization

Low-Level Waste (LLW) Defined

Waste contaminated with low-level radioactive components only or with radioactive components and constituents solely regulated by DTSC (not by RCRA) is LLW.

Approval of this type of waste must be obtained from the LLW Team of the HWM Waste Generator Services Group prior to acceptance into the HWM storage facility.

Characterizing LLW

All waste must be characterized before it can be transported to a HWM facility. Your characterization will allow HWM to safely handle, segregate, store, treat, and send your waste off-site for disposition.

To determine if your waste needs to be sampled and analyzed for radionuclides and for absence of RCRA hazardous constituents, contact your HWM field tech to coordinate the process.

Process Knowledge

NOTICE

LLW that is generated at LLNL is characterized by waste generators through their knowledge of the process that generated the waste. This information is documented on a Process Knowledge Evaluation Form (PKE) (**Appendix F**), on a Waste Evaluation Form (WEF) (**Appendix F**), or on a Waste Disposal Requisition (WDR) (**Appendix B**).

A generator must know in advance that the process being used might create LLW.

The purpose of the PKE form and WEF (WCP0123) is to identify any hazardous and radioactive nuclides or constituents that may be present in a specific room. This information is based on the processes carried out in the room and the chemicals present there.

There are two types of PKE forms. Both are found in **Appendix F**. PKE form (WCP0030), Process Knowledge Evaluation Form, is filled out for routine generated waste streams. They are filled out by the generator, reviewed, and approved by the Environmental Analyst and Waste Certification Official. PKE form (WCP0124) Non-Routine Waste Process Evaluation Form is filled out for non-routine waste streams such as equipment, sources, etc.

When to use a PKE, WEF, or WDR to document Process Knowledge:

- PKE forms are used to document all solid LLW contaminated with radionuclides only.
- A WEF is used to document all liquid LLW, and solid LLW contaminated with hazardous constituents regulated by the State Department of Toxic Substances Control (DTSC) that are routinely generated.
- A WDR is used to document waste that is nonroutinely generated and is a liquid or solid LLW contaminated with DTSC constituents.

A new process

If you are performing a new process that will generate LLW, contact your area HWM field tech, who can help you determine the appropriate documentation to complete.

Short-lived isotopes

Decay in storage is a program that applies to waste containing short-lived isotopes (≤90 days). These wastes are allowed to remain in storage until the short-lived isotopes have decayed to levels indistinguishable from background levels and are then released as non-radioactive wastes.

Waste Generator Services works with waste generators to ensure that waste accumulation occurs in accordance with HWM characterization, packaging and release criteria.

Waste streams must meet the following requirements in order to be considered for the decay in storage program:

- generated in one single location
- accumulation log sheet associated with it
- all isotopes used in the room of generation must be listed on the log sheet
- contains isotopes with half-lives <90 days
- alpha emitters will be considered on a case-by-case basis.

Sampling and Analysis

Sampling and analysis of waste is done according to a preapproved sampling and analysis plan.

If you are generating low-level waste and are unable to calculate the activity or determine the radionuclide level in the waste through process knowledge or waste assay, then you need to arrange for it to be sampled. Contact your HWM field tech for assistance. See Section 3.1 (Hazardous Waste on page 45 for more information).

You must also sample and analyze your waste if you are uncertain as to whether regulated hazardous materials may be present.

You should provide the sampling personnel as much information about the composition of your waste as possible. Before collecting the sample, the sampling or field tech reviews the sampling method and strategy to determine if they are safe and appropriate for the waste.

If RCRA hazardous constituents above regulatory limits are contained in your LLW, then the waste must be characterized as mixed waste (see Section 3.4).

There are several sampling methods for the various kinds of waste. The sampling method and devices used to sample a container of waste depend on the generator-supplied information.

Sampling and Analysis Worksheet

The Sampling and Analysis Worksheet (SAW) is used for waste certification purposes when there is insufficient generator knowledge or analytical information available to certify the waste. The SAW documents the specific sampling procedure and analyses that need to be conducted to demonstrate compliance with *The Nevada Test Site Waste Acceptance Criteria* (*NTSWAC*) (latest version). Contact the HWM field tech for assistance in completing the SAW. The SAW form can be found in **Appendix F**.

Radionuclide Determination and Reporting

NOTICE

As a low-level waste generator, you are responsible for identifying all radionuclides present in your waste stream. Be sure to list all radionuclides on the appropriate Parcel Card (WPC) for each parcel of solid LLW or on the WDR, as specified in the EPD course EP0110, LLW Generation and Certification.

If the container and the parcel are the same, no parcel card is required. The WDR takes the place of the parcel card.

Abbreviations are not permitted on the WPC or WDR. For example: the term “MFP” cannot be used for mixed fission product; instead, each radionuclide needs to be specified on each WPC and / or WDR.

For solid LLW, consult your specific LLW handling packaging procedure or instructions for the radionuclide determination and assay method to be used for your waste stream. Contact your facility manager or the HWM field tech if you have any questions.

Ranges and > or < signs are not permitted on the Waste Disposal Requisition or Waste Parcel Card. Discrete values should be entered.

Exempt Radionuclides

Radionuclides meeting any of the following criteria are exempt from the reporting requirements:

- Any radionuclide, as listed in the table below, that will reach a state of transient or secular equilibrium with a parent radionuclide within the operational period of the disposal site.
- Any radionuclide occurring at activity concentrations not exceeding background ranges for the region in which it was generated and material of interest. Use of this exemption requires approval from HWM.

^{90}Y, ^{93}Nb, ^{126m}Sb, ^{126}Sb, ^{137m}Ba
^{233}Pa, ^{225}Ra, ^{225}Ac, ^{221}Fr, ^{217}At, ^{213}Bi, ^{213}Po, ^{209}Tl, ^{209}Pb
^{239}Np, ^{231}Th, ^{227}Th, ^{223}Fr, ^{223}Ra, ^{219}Rn, ^{215}Po, ^{211}Pb, ^{211}Bi, ^{211}Po, ^{207}Tl
^{234}Th, ^{234m}Pa, ^{234}Pa, ^{222}Rn, ^{218}Po, ^{214}Pb, ^{214}Bi, ^{214}Po, ^{210}Bi, ^{210}Po
^{240}U, ^{240m}Np, ^{240}Np, ^{228}Ra, ^{228}Ac, ^{228}Th, ^{224}Ra, ^{220}Rn, ^{216}Po, ^{212}Pb, ^{212}Bi, ^{212}Po, ^{208}Tl

Radionuclide Quantification

Radionuclide must be quantified. Quantification may be determined by various methods.

Examples of Assay Methods

Following are examples of various assay methods currently used at LLNL:

- **Tritium** – When uncontained tritium is present in the waste (e.g. B331), estimate the quantity of tritium contained in the parcel and enter it on the WPC. When the LLW container is full, gas sampling is performed to accurately determine the total amount of tritium.
- **Plutonium –** The generator lists the grade of plutonium on the WPC. So that total curie quantity can be calculated, the container is counted on the high sensitivity neutron instrument. (Any container exceeding 100 alpha nCi/gram is not considered low-level waste.)
- **Uranium** – When uranium is present, three methods can be used to estimate its quantity:
  - measuring with a portable radiation meter and convert to curies (AVLIS method)
  - calculating by mass balance
  - mass – activity is determined by the weight of the material.
- **Mass Balance** – Mass balance is permissible, however, it must be documented, and be reproducible.
- **Scaling Factors/Ratios** – It is permissible to scale other radionuclides from the measurement of a known radionuclide. The ratios or scaling factors used must be clearly described on the PKE or WEF forms.

Add the amounts of radioactive material on all the WPCs or Fill Record together to determine the total amount of each radionuclide in the waste container (for solid LLW), then enter that total on the WDR.

NRC exemptions for radioactive waste containing tritium or carbon 14

For Nuclear Regulatory Commission (NRC) exemptions for certain radioactive wastes, see Section 3.6, Special Case Waste, “Animals” contaminated with tritium or carbon 14 and “Scintillation cocktails” for special exemptions on fluids contaminated with tritium and carbon 14.

Criteria for Waste Acceptance

When packaging LLW, there are specific criteria that must be addressed.

General Criterion	LLNL Criteria
Radionuclide concentrations / quantities for specific radionuclides	Concentrations of alpha emitting transuranium nuclides with a half-life greater than (>) 20 years in waste must be less than or equal to (≤) 100 alpha nanocuries / gram. No more than 6 PE-Ci* per container are allowed. No more than 1000 curies* of tritium is allowed per container.
Criticality safety	• 120 grams of fissile isotope. (Pu-239, U-233, U-235) • Waste must be in a form that allows containers to be stored in an infinite array.
Classified waste (see Special Case Waste)	All classified waste must be managed in such a way as to protect the classification of the material. Every effort shall be made to declassify radioactive waste prior to disposal.
Surface dose rate	The combined β,γ, and neutron dose rate anywhere on the surface of an LLW waste container may not exceed 200 mrem / hr (the "contact-handled" limit).
Internal heat generation	Internal heat generation produced by radioactive decay must not cause damage to the integrity of the container.
Compressed gases, aerosol cans (see Special Case Waste)	Compressed gases, aerosol cans and chemicals capable of generating gases or causing generation of liquids or vapors harmful to persons handling the containers are not allowed in radioactive waste.
Chemical and structural stability of waste packages, radiation effect, microbial activity, chemical reactions, and moisture	Waste must not have the potential for chemical reactions that would damage the integrity of the waste container. Waste must be structurally compatible with and fully contained by the container. Waste must not cause any radiation degradation effect on the container; such as embrittlement of plastic, and must not react with the constituents of the package and break down its integrity. Waste must not generate any moisture or free liquids that could produce rust and compromise the container.
Chelating and complexing agents	Must be less than 1% by weight of the waste.
Free liquids in solid waste	Solid radioactive waste shall contain as little free liquid as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5 percent by volume of the external waste container.
Removable surface contamination	See *Health & Safety Manual*, Supplement 33.02, Appendix D.

* The 6 PE-Ci and 1000 curie tritium limits are HWM operational limits. On a case-by-case basis, HWM may accommodate higher quantities.

Additional Requirements for Solid LLW

General	Criteria
Particulates	Powders, ashes, and similar particulate waste materials shall be immobilized if more than one weight percent of the waste matrix weight consists of particles below 10 microns in diameter, or if more than 15 weight percent consists of particles below 200 microns in diameter. Waste that is known to be in a particulate form that could mechanically or chemically be transformed to a particulate during handling and interim storage shall be immobilized. If particulates are smaller than 10 microns in diameter (e.g., concrete dust), bag the waste in a total thickness of 6 mil plastic or greater, prior to placing waste into container.
Stabilization	Where practical, waste shall be treated to reduce volume, promote waste minimization, and provide a more structurally and chemically stable waste form. Every effort shall be made to reduce the volume by efficiently loading the containers and by minimizing the amount of waste generated.
Etiologic agents	Waste containing pathogens, infectious waste, or other etiologic agents as defined in Title 49 CFR 173.386 shall not be disposed of in this waste stream. If waste is suspected of containing etiological agents, segregate and contact the HWM field tech or the Environmental Analyst for guidance on how to dispose of the waste.
Polychlorinated biphenyls (PCBs)	Waste contaminated with PCBs greater than 5 ppm will not be disposed of in this waste stream. Any waste suspected of containing PCBs must be segregated. Complete a Sampling and Analysis Worksheet and submit to the Radiological Characterization Analyst for sampling. PCBs greater than 5 ppm will be accepted on a case-by-case basis.
Pyrophorics	LLW shall not contain pyrophoric material in a form that could spontaneously explode or combust if the container is breached. If waste is suspected to contain material that could spontaneously explode or combust if the container is breached, segregate and contact the HWM field tech for guidance. For pyrophoric uranium, see packaging requirements section.
Explosives	LLW shall not contain explosives that are deemed reactive as identified in 40 CFR 261 and CCR Title 22, Division 4.5, Chapter 11, Section 66261. Segregate explosives that are deemed reactive from LLW.
Asbestos	LLW shall not contain friable asbestos. If your waste contains friable asbestos, segregate it and contact your Environmental Analyst or HWM field tech. Waste containing non-friable asbestos shall be double bagged.
Filters (see also Special Case Waste HEPA filters)	All prefilters and HEPA filters, other that respirator cartridge filters, shall be segregated. Provide the following information on the requisition: Where the filter came from, what bank it was in, where the bank was located (Example: B177, North Bank, row 2, attached to rooms 1015 and 1021), and then submit the requisition to HWM for review and approval.

3.2.2 Documentation

Documentation Package—Waste Disposal Requisition Analytical Data (if applicable) Waste Parcel Card (if applicable) Fill Record (if applicable)

NOTICE

Before low-level waste can be transferred from the workplace or WAA to an HWM facility, a documentation package must be completed.

A documentation package contains information about the waste that enables HWM to properly manage and track the waste and is required before transport to an HWM facility.

The documentation package consists of:

- Waste Disposal Requisition
- Analytical data (if applicable)
- Waste Parcel Card (if applicable)
- Fill Record (if applicable).

Waste Disposal Requisition (WDR)

The Waste Disposal Requisition (WDR) is a document for the generator to transmit information required by HWM to properly manage waste. It is an internal tracking device that assures that HWM meets its cradle-to-grave tracking responsibilities and its proper completion starts the process of removing the waste from the workplace. It also becomes part of the documentation package.

Before you remove your waste from your workplace, you must complete a Waste Disposal Requisition (WDR).

Source Codes define the process that created your waste (see **Appendix B**). Choose the one that best describes your process. If you need help, contact your HWM field tech or your environmental analyst.

If a PKE or WEF has not been completed, then information must be provided regarding the creation and processes associated with waste generation. This information should be written on the WDR, or attached as necessary.

You are responsible for completing the WDR as soon as your waste is ready for removal. Your HWM field tech can assist you in filling it out.

Detailed information and instructions on how to fill out WDRs are in **Appendix B**. When necessary, ask your HWM field tech for clarification.

Waste Parcel Card (WPC)

A Waste Parcel Card (WPC) is only applicable for solid LLW, when there are multiple parcels in a shipping container.

As a generator you are responsible for completing the WPC as the waste is being accumulated in a parcel.

The WPC provides information pertaining to:

- method used to determine the activity and nuclide
- description of the waste
- disposal facility specific waste acceptance criteria
- process knowledge evaluation form number.

A WPC is not mandatory when the container contains only one parcel of waste, when items will be packaged for shipment at the HWM Storage Facility (e.g., sealed sources, equipment), or when a Fill Record is used. The WPC can be found in **Appendix F**.

Fill Record

A Fill Record (on page 72) is an accumulation list of waste being placed in a container. A fill record may be used in place of multiple WPCs when the waste is generated in the same location.

For example a Fill Record can be used in place of WPCs when a transportainer is filled with waste over a period of time and serves to describe the waste items that were put in the container, the date, who put the waste in the container, and who verified the waste.

Contact a Radiological Characterization Analyst of the Waste Generator Services Group for other acceptable uses of a Fill Record.

Examples of LLW Fill Records

Sample for parcels of lab trash using AVLIS method

LLW Fill Record

Container #_____ Date Started_____ Date Full_____

Bldg. of Origin: ____ PKE Number: _____

Description - Check all that apply, add other items not already listed. Assure that the components are authorized per the applicable PKE.

Date _____ WPS # _____	❒ Paper wipes, ❒ PPE (❒ booties, ❒ coveralls, ❒ gloves, ❒ plastic ❒ glasses), ❒ respirator cartridges, ❒ plastic bags, ❒ plastic sheets, ❒ tacky mats, ❒ tape, _____ _____	Activity _____ Room # _____	Filler Initials _____	Verifier Initials _____

Rad Survey Information for the above waste: AVLIS Method Used: ❒ A ❒ B

Prior to survey: Check Source Jig No. _____ Detector Response (30%) ❒ Satisfactory

Survey Meter Model: _____ Serial Number: _____ Calibration Date: _____

Meter Reading: (Average radiation survey meter reading, if Method A). _____cpm

Sample for Site 300 Transportainer

LLW Fill Record

Page ____

Container Serial # Q _____ WDR # W _____

Date	Description	Shot Name	Bunker Number	Filler Initials	Verifier Initials
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Sample for a Transportainer

LLW Fill Record

Page ____

Container Serial # Q _____ WDR # W _____

Date	Description	Filler Initials	Verifier Initials
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

3.2.3 Waste Preparation

Packaging

Packaging your waste in the proper container ensures that you avoid dangerous situations.

You must not put incompatible wastes into the same container or put waste into a container that may be incompatible with the waste. Such activities could cause dangerous fumes or explosions. Storing incompatible wastes could cause the container to deteriorate and leak.

All containers need to be approved by LLNL's Hazardous Materials Packaging and Transportation Safety Committee (HMPTS). Generally, all packaging materials provided through Stores or HWM have been approved by the HMPTS committee.

Package waste in the smallest acceptable container in which the waste will fit.

The amount of radioactivity packaged in any one container may not exceed the quantity specified for a Type A container in DOT shipping requirements, 49 CFR 173.431 through 49 CFR 173.435, without prior approval from a Radiological Characterization Analyst and the HWM Shipping Office.

A table in **Appendix C** lists the size and composition of the various approved containers. The types of packaging materials that are used within containers for different types of waste are also described.

Plastic is not permitted as the primary containment layer for radioactive waste.

Your HWM field tech can also advise you on the type and size container to use, what wastes can be combined in a container, what wastes need to be segregated from each other, and what kind of packaging materials to use within the container.

Additional Requirements for Solid LLW

Facility Specific Handling and Packaging Procedures or LLW Packaging and Containerization Instructions must be followed during the packaging of solid LLW.

See Attachment 1 on next page of this section for a generic LLW Packaging and Containerization Instructions. Packaging Instructions and a Radiological Guidance Supplement will be provided to the generator once Waste Generator Services receives and reviews a PKE.

Liquid waste

Pack liquid waste in separate containers from solid waste and gaseous waste. No liquids, including liquids already packaged in containers, may be packed in a waste drum containing solid waste and that is marked SOLID WASTE.

Pyrophoric uranium

Pyrophoric uranium waste must be covered with water, trimsol, or a water/trimsol mixture and packaged in a vented 30-gallon container.

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Attachment 1

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LLW PACKAGING AND CONTAINERIZATION INSTRUCTIONS

Instruction # 18 Page 1 of 5

Section I - To be Completed by HWM Personnel

1. Waste Type: Laboratory Trash

   Waste Stream Number: BCLA-HWM000005

2. Types of Containers Authorized for Packaging (The following containers are authorized to package this waste stream).

   ■ DOT UN1A2 or 17C - 55 gallon drum
   ■ DOT UN1A2 or 17C 30 gallon drum
   ■ 2x4x7 STC Box
   ❒ 4x4x7 Type A Box
   ■ 4x4x7 STC Box
   ❒ 8x8x20 Transportainer

3. Packaging Instructions (include inner packaging, if applicable):

To be packaged by: ■ HWM and/or ■ Generator

Container Pre-Use Inspection

Container Inspections must be performed on all LLW containers. Prior to any waste being placed into the container, a HWM Field Technician or container custodian shall inspect all containers (drums and steel boxes) as outlined in the Waste Disposal Requisition (WDR) Instructions. The inspector shall initial the WDR if the container is acceptable. If the container is unacceptable segregate the container and contact your HWM Filed Technician.

For boxes, document the manufacturer serial number on the WDR. (Example: Mft. serial # 123456)

If the WDR that is being used is dated prior to 1/97, a Container Inspection Card must be completed.

Note: If there is not a Q numbered serial number on the container, do not use the container, and contact the HWM Filed Technician.

Waste Accumulation

All waste accumulation containers (parcels) shall be accompanied by a notebook, list or parcel card stating what items have been put into the parcel. Example: Paper wipes, glass test tubes, empty poly containers. The notebook, list or Parcel Card shall be attached to the accumulation container.

If a notebook or list is used the information shall be transferred to a Parcel Card or WDR when the parcel becomes full.

Note: The Parcel Card can be initiated when waste is first being placed into an accumulation container or once the accumulation container (parcel) is full and ready to be transferred to a HWM approved shipping container. A Parcel Card is not needed if the final waste contains only one (1) parcel. Use space provided on the WDR.

Documentation

***Note*: Any changes to the Parcel Card and Waste Disposal Requisition must be lined out, initialed and dated. All paperwork must be completed in blue or black ink.**

The LLW Generator shall prepare the LLW parcel as follows:

- Place LLW generated into appropriate LLW parcel containers, if applicable. Examples of appropriate parcel containers are polyethylene bags, and plastic bags. In some cases the parcel may be a 55 gallon drum. When the parcel is a bag, seal any openings.
- Complete all applicable sections of the Parcel Card or WDR by following the directions on the back of the card, or the WDR instructions:
- Identify the Parcel Card or WDR number on the serialized Waste Package Seals (WPS) to be used on the LLW parcel.
- Apply the WPS(s) to the parcel. The WPS can be applied at the time of parcel verification. However, the seal must be applied prior to or the same day of the generator certification. It is the responsibility of the generator to maintain control of the parcel until a WPS has been applied.

Document the WPS numbers on the Parcel Card or WDR in the space provided.

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The waste generator signs the "Generator Certification" statement certifying that the LLW contains no hazardous materials and that the information provided is accurate and complete.

Notify a verifier that a parcel is ready to be verified.

Parcel Verification

A Verifier (someone other than the generator who is EP0006 and EP0110 trained) shall verify that the parcel meets the requirements of the NTS waste acceptance criteria.

Verification entails the following activities:

- The verifier needs to visually examine all waste items. Assure that there are no prohibited items in the waste parcel and assure that all the items in the parcel are documented on the parcel card or WDR.
- The verifier assures that the WPS's unique serial number is documented on the Parcel Card or WDR.
- Fill out and sign the verifier section of the Parcel Card or WDR in dark ink.

If WPSs need to be broken to verify the waste parcel:

- Identify the Parcel Card or WDR number on the new set of serialized WPSs to be used on the LLW parcel.
- Apply the WPS(s) to the parcel and sign the verifier section of the Parcel Card or WDR.
- On the Parcel Card or WDR draw a line through the original WPS number, initial and date. Then write the new WPS number on the Parcel Card or WDR.

Once the parcel has been verified contact a container custodian to place the waste parcel into a container, if not already in a container.

Container Custodian (an HWM Field Technician, unless otherwise noted in a supplement to these instructions)

Once the first parcel has been placed into the LLW container, complete and affix a Radioactive Waste Label to the LLW container.

Initiate the WDR, by writing the WAA number, and the type and size of the container on the requisition.

If there is a single parcel in the container or the parcel is the container, the container custodian observes the application of the WPS and assures that it is documented on the appropriate paperwork, the WDR or Parcel Card.

Place the verified LLW parcel into an approved LLW container for on-site transfer and:

- Document the WDR number on the Parcel Card, if applicable.
- When there are multiple parcels, identify the Parcel Card number for each LLW parcel that is placed in the LLW container. If additional space is needed for logging in LLW parcels, use a WDR Continuation form.
- Write the radionuclide (e.g. Depleted Uranium, Natural Uranium) and total activity for the container on the Disposal Requisition obtained from the Parcel Cards. (Total activity means add all the particular isotope e.g. Depleted Uranium) activities on the parcel cards together and write the total on the requisition. If more than one nuclide is present add all the activities of each individual nuclide together and put the total for each nuclide on the requisition.)

Once the container has become full, complete the WDR in dark ink by:

- Writing the date the container became full on the WDR.
- Ensuring that all the Parcel Card Numbers, when applicable, are on the WDR.
- Writing the radionuclide (e.g., depleted uranium) and total activity for the container on the WDR obtained from the Parcel Cards, when applicable.
- Checking that the LLW Container is acceptable.
- Writing the total weight of the package on the WDR. (Add all the parcel weights together and the container weight) (The 55 gallon drums weigh 60 pounds).

- Completing the Container Custodian Section of the WDR, once the container has been closed. **When there are multiple parcels in a container the Container Custodian, not the generator, is to sign the WDR. For single parcel containers the generator is to sign this section.**

When the Parcel Card and Waste Disposal Requisition have been completed and signed contact the Hazards Control Health and Safety Technician. The Hazards Control Health and Safety Technician shall survey the container in accordance the Container Survey Section.

The LLW Container Custodian shall transfer the LLW container to the Waste Accumulation Area (WAA) as follows:

Transfer or arrange for the transfer of the LLW container to the WAA.

Make a copy of the documentation package, place the copy in a plastic envelope, and attach the plastic envelope to the LLW container.

If the LLW Container Custodian is not an HWM Field Technician, forward the original documentation package to the HWM Field Technician.

The HWM Field Technician shall deliver the documentation package to HWM Requisition Control Office for processing.

Waste Container Control

The LLW Container Custodian shall maintain complete control of the LLW container by logging each LLW parcel that has been added into the LLW container onto the Waste Disposal Requisition and utilizing one of the following methods to restrict access to the container:

Placing a locking lid on the LLW container.

OR

Locking the LLW container in a room such that access is limited only to the personnel who are authorized to place LLW parcels into the LLW container.

OR

Restricting access to the container so that only authorized personnel have direct access to the area, i.e. through the use of existing security systems that limit personnel access to areas where LLW containers are located.

Waste Container Closure

Temporary closure, place a lid on the drum, and apply WPS(s).

Record the seal number(s) on the Waste Disposal Requisition.

Final container closure is to be performed in accordance with procedure WCP-9.

Contact Annie Andrade at extension 3-0706, pager number 01744, John Shingleton at extension 3-3195, pager 01780 or Karen Riley at extension 3-7027, pager 01067.

Survey of Waste Container

The Hazards Control Health and Safety Technician shall survey the LLW container as follows:

- Survey the LLW container for external levels of radiation at contact and at 1 meter and record the information on the Waste Disposal Requisition.
- If the combined beta-gamma radiation level is greater than 200 mR/hr at contact or 10 mR/hr at 1 meter and/or removable contamination is detected above applicable DOE Order or DOT regulation levels, initiate an NCAR in accordance with the Nonconformance and Corrective Action section of these instructions.
- Perform a swipe survey (DPM/100 cm2) for alpha, beta-gamma and tritium as required. If the survey is not required or applicable, mark “N/A” in the appropriate block on the Waste Disposal Requisition.
- Enter the radiation level on the Radioactive Waste label affixed to the LLW container.
- Enter name, L-code, employee number, on-site telephone extension, signature and date in the spaces provided on the Waste Disposal Requisition.

LLW PACKAGING AND CONTAINERIZATION INSTRUCTIONS

Nonconformance and Corrective Action

Nonconformances are anything that could make the waste non certifiable, this may include, incorrect documentation, not following procedures, using out of calibration equipment (e.g. scales, survey meters, and torque wrenches), or waste improperly packaged. Nonconforming waste shall be segregated and marked with NCAR status indicator or labels (available from the WCP). Status indicators may only be removed under the direction of the WCP personnel.

Reporting Nonconformances

The person discovering the nonconformance (generator, verifier, Waste Certification Engineer, etc.) shall issue a nonconformance report in which the conditions preventing waste acceptance and certification are described. The original shall be submitted to the Waste Certification Engineer for review of the validity of the nonconformance and for distribution to the responsible individual.

Corrective Actions

The cause of the nonconformance and the actions taken to correct it are documented on the NCAR. The waste generator is responsible for performing corrective action to restore waste to conformance with the requirements of NTS-325, latest revision, and this procedure. When corrective actions have been completed, the waste generator shall sign the NCAR and send it to the Waste Certification Program for NCAR closure in accordance with procedure WCP-3, Nonconformance and Corrective Actions.

Section II - To be Completed by a Waste Certification Engineer

1. Training Required: EP0006 and EP0110 or OJT (For waste packaged by an HWM Field Technologist, EP0110 or OJT is not required)
2. Authorized Components:

   Refer to applicable Process Knowledge Evaluation Form or Authorized Components List.

3. **WCP Contact(s): Annie Andrade extension 3-0706, pager 01744, John Shingleton extension 3-3195, pager 01780 or Karen Riley at extension 3-7027, pager 01067**
4. Radioassay Instructions (Use the following instrument or method to determine the activity of the waste item(s).
   - For one-time waste streams, the method used to determine the radionuclides and activity must be identified on the Process Knowledge Evaluation Form.
   - For ongoing waste streams, follow the radioassay instructions provided on the supplement to these instructions for the applicable PKE. (A supplement will be issued to the generator at the time that a PKE is approved)
5. Waste Acceptance Guidance (Also see HWMWAC, Section 3.2.1, Criteria for Waste Acceptance)

Transuranics

If waste is contaminated with transuranic nuclides the waste must be assayed to demonstrate that it is below 100 nCi/gram or sufficient process knowledge must be available and documented to assure that the waste is below 100 nCi/gram.

Hazardous Waste Components

If the process generating the waste uses regulated hazardous materials as identified in 40 CFR 261 and CCR Title 22, Division 4.5, Chapter 11, Section 66261, "Identification and Listing of Hazardous Waste.", assure that the materials are below regulatory requirements. If constituents are above regulatory limits segregate the waste from other LLW. If you are unsure if the hazardous constituents are above regulatory limits, have the HWM Field Technician complete a Sampling and Analysis Worksheet.

Free Liquids

LLW shall contain as little free liquid as is reasonably achievable, but in no case shall the liquid equal or exceed 0.5 percent by volume of the external waste container. If free liquids are present, either absorb them on diatomaceous earth or segregate them and contact the HWM Field Technician.

LLW PACKAGING AND CONTAINERIZATION INSTRUCTIONS

Particulates (Immobilization)

Powders, ashes, and similar particulate waste materials shall be immobilized if more than one weight percent of the waste matrix weight consists of particles below 10 microns in diameter, or if more than 15 weight percent consists of particles below 200 microns in diameter. Waste that is known to be in a particulate form or in a form that could mechanically or chemically be transformed to a particulate during handling and interim storage shall be immobilized.

If particulates are smaller than 10 microns in diameter (e.g., concrete dust), bag the waste in a total thickness of 6 mil plastic or greater, prior to placing waste into container. If waste is suspected of containing fine particulates, double bag.

Gases

Compressed gases as defined by Title 49 CFR 173.300, including unpunctured aerosol cans, shall not be disposed in LLW container. Segregate gas cylinders and unpunctured aerosol cans. Puncturing aerosol cans is a safety concern, please consult you Health and Safety Technician for guidance if you wish to puncture any aerosol containers.

Stabilization

Every effort shall be made to reduce the volume by efficiently loading the containers and by minimizing the amount of waste generated.

When possible waste shall be compacted, crushed, or cut to reduce the volume prior to waste being packaged for shipment.

Etiologic Agents

Waste containing pathogens, infectious waste, or other etiologic agents as defined in Title 49 CFR 173.386 shall not be disposed of in this waste stream.

If waste is suspected of containing etiological agents segregate and contact the HWM Field Technician or the Environmental Analyst for guidance on how to dispose of the waste.

Chelating Agents

Whenever chelating agents are used they shall be at a concentration less than one percent by weight. Example: Radiacwash shall be diluted with water, prior to use.

Polychlorinated Biphenyls (PCBs)

Any waste suspected of containing PCBs must be segregated. Complete a Sampling and Analysis Worksheet and submit to the Waste Certification Engineer for Sampling.

Pyrophorics

If waste is suspected to contain material that could spontaneously explode or combust if the container is breached, segregate and contact the Waste Certification Engineer for guidance.

Explosives

LLW shall not contain explosives that are deemed reactive as identified in 40 CFR 261 and CCR Title 22, Division 4.5, Chapter 11, Section 66261. Segregate explosives that are deemed reactive from LLW.

Asbestos

If your waste contains friable asbestos segregate it and contact your Environmental Analyst or HWM Field Technician. Waste containing non-friable asbestos shall be double bagged.

Filters

All prefilters and HEPA filters, other than respirator cartridge filters, shall be segregated. Provide the following information on the requisition: Where the filter came from, what bank it was in, where in the bank it was located (Example: B177, North Bank, row 2, attached to rooms 1015 and 1021), and then submit the requisition to RCO for review and approval

See supplement to these instructions for ongoing waste streams.

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SUPPLEMENT TO LLW PACKAGING AND CONTAINERIZATION INSTRUCTIONS

For routinely generated waste, a supplement will be provided to each generator as a PKE is approved

PKE # _____ Complete a separate Supplement for each ongoing PKE

4 Radioassay Instructions (Use the following instrument or method to determine the activity of the waste item(s).

To be completed once a PKE is approved.

Labeling

DOE Order 5820.2A requires that all low-level waste containers be labeled.

All labels can be obtained from Stores. The label should be filled in and affixed to your container as soon as you begin adding waste to it. The label should be updated as needed every time waste is added.

Be sure the label is filled out legibly, accurately, and is clearly visible on the container. Incomplete labels or inaccurately labeled waste containers are out of compliance with regulations and can not be accepted at the WAA, CWAA, or HWM.

Strike-throughs are not allowed on the label. If changes are necessary, remove the label from the container and start over with a new one. Do not place a new label over the old one.

Appendix D contains examples of the labels that must be affixed to waste containers. Note how each one is filled out.

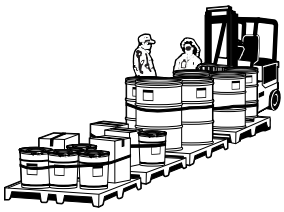
If you have questions, please contact your HWM field tech or environmental analyst.

Segregating

All waste should be segregated by waste type. Solid low-level waste should be segregated from hazardous, mixed, TRU, medical, and nonhazardous wastes. In addition, solids, liquids, and gases (aerosols or gas cylinders) should be placed in separate containers and kept in separate spill containment areas.

Based on HWM operational needs, your HWM field tech may suggest other segregation configurations.

Transfer to WAA



Before your certified LLW can be moved to a WAA or CWAA, you should check to see that the following have been taken care of:

- you as the generator have characterized the waste to the best of your knowledge
- the waste is in a suitable, properly sealed container
- a Health & Safety tech has swiped and surveyed the outside of the container and the container is clean and free of external contamination
- the proper label has been completely and accurately filled out and affixed to the container
- the WDR, WPC, or Fill Record, if applicable, have been filled out and signed by you, the generator
- the WDR is submitted to HWM for approval
- if analysis is needed, a SAW has been completed.

If sampling is required, it will be done after the container is closed on the Workplace End Date and in the appropriate location.

Contact your HWM field tech to review the container and its associated paperwork.

Approval Process

Contact your HWM field tech so that you can jointly complete the paperwork process. Your HWM field tech will check the waste package to ensure that the waste has been put into the proper container, is correctly labeled, and the required information has been included on the waste documentation package or if any sampling and analysis is required.

The HWM field tech will forward the waste documentation package to HWM for further processing. You will be notified by the field tech if there are any discrepancies that need to be corrected. If the waste documentation package is approved, a copy will be returned to you.

3.3 Transuranic (TRU) Waste

Topic	Subtopic
3.3.1 Characterization **Pages 87 - 91**	• *TRU Waste Defined* • *Process Knowledge* • *Sampling and Analysis* • *Criteria for Waste Acceptance*
3.3.2 Documentation **Pages 92 - 93**	• *Documentation Package for Certifiable TRU Waste* • *Container Inspection* • *Waste Parcel Card (WPC)* • *Waste Disposal Requisition (WDR)*
3.3.3 Certification **Page 94**	• *Certifiable TRU Waste* • *Noncertifiable TRU Waste*
3.3.4 Waste Preparation **Pages 95 - 97**	• *Preapproved Packaging Procedures* • *Labeling* • *Segregating* • *Transfer to WAA* • *Approval Process*

Training Requirements: As a generator of TRU waste you are required to take the training courses EP0021, *TRU Waste Generation and Certification*, as well as EP0006, *Hazardous Waste Generation and Certification*, and, annually thereafter, EP0006-R, *Hazardous Waste Generation and Certification Review*.

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3.3.1 Characterization

TRU Waste Defined

Transuranic Waste (TRU) is waste that is contaminated with alpha-emitting transuranium radionuclides with:

- atomic number greater than 92
- half-lives greater than 20 years
- concentrations greater than 100 nCi of alpha activity per gram of waste at the time of assay.

Process Knowledge

The TRU waste that is generated at LLNL is characterized by the waste generators, mainly through their knowledge of the process that generated the waste. This must be documented on a Process Knowledge Evaluation form.

A generator should know in advance that the process being used will create TRU waste. Approval of this type of waste must be obtained from the TRU waste team of the HWM Generator Services Group.

A new process

If you are planning a new process that will generate TRU waste, contact the TRU waste radiological characterization analyst and your environmental analyst or HWM field technician. They can help you determine if the waste generated from this process is certifiable and help you fill out a Process Knowledge Evaluation form.

Sampling and Analysis

NOTICE

All TRU waste received by HWM will have their headspace gases sampled and analyzed for hydrogen, methane, and certain volatile organic compounds. In the future, homogenous solids will be randomly sampled and analyzed for RCRA constituents if required by the Waste Isolation Pilot Plant (WIPP).

Radionuclide Determination and Reporting – Segmented Gamma Scanner Assay – Plutonium Facility TRU waste drums

TRU waste drums containing Pu-239 are assayed in the Plutonium Facility by a segmented gamma scanner. This device is calibrated to detect only Pu-239. It is essential that the waste generator provide the relative amounts of all other radionuclides known to be present so that their absolute amounts can be calculated. This is usually provided by marking the presence of one or more grades of plutonium. The generator may also provide the absolute amounts of other radionuclides.

The segmented gamma scanner will be upgraded to assay radionuclides other than Pu-239, as required by the Waste Isolation Pilot Plant.

In addition, each waste package is weighed on a calibrated scale so that the concentration of activity in the waste can be calculated. Materials Management conducts this process in B332.

If a TRU waste drum from the Plutonium Facility does not contain Pu-239 or the relative amounts of other radionuclides are not known, other methods must be used to assay the drum or to estimate the amount of all radionuclides present. You may get assistance from the TRU waste radiological characterization analyst, materials management assay personnel, the facility's health physicist, and your environmental analyst.

Radionuclide Determination and Reporting – Gamma Spectrometry Assay – Heavy Element Facility TRU waste parcels	TRU waste parcels in the Heavy Element Facility are assayed individually by gamma spectrometry. The waste generator or container custodian should enter the total amount of radionuclides on the WDR. The generator should also provide a printed record (e.g., a spreadsheet) of these amounts and of the weight of each parcel. The parcel weight is required so that the concentration of activity in the waste can be calculated.
Radionuclide Determination and Reporting – TRU waste boxes	At present, neither the Heavy Element Facility nor the Plutonium Facility has equipment to assay TRU waste boxes (TRUPACT-II standard waste boxes). Until equipment is acquired, other assay methods or process knowledge must be used to estimate the amounts of radionuclides in boxes. Consult your TRU waste radiological characterization analyst, environmental analyst, or health physicist for assistance and approval.
Radionuclide Determination and Reporting – Other TRU waste	TRU waste from facilities other than the Plutonium Facility or Heavy Element Facility and atypical waste, not described in a facility-specific Process Knowledge Evaluation (PKE) require the completion of a non-facility-specific PKE according to waste certification procedures. Other types of TRU waste, for example, sealed sources, also require the appropriate non-facility-specific PKE. The PKE will specify the type of assay necessary, as determined by the Radiological Characterization Analyst. Contact your HWM field tech for guidance.

Criteria for Waste Acceptance

NOTICE

HWM accepts the following dry, solid TRU wastes:

- TRU wastes that are not classified (TRU waste that is classified shall be processed by the generator to remove or destroy the classified characteristics prior to certification.)

Criteria for acceptance of TRU waste

Criterion	LLNL Criteria
Containers	55-gallon drum or TRUPACT-II Standard Waste Box (SWB)
Removable surface contamination	The WIPP limits are 20 dpm / 100 cm^2 of α-emitting radionuclides and 200 dpm / 100 cm^2 of β-γ-emitting radionuclides or up to 1000 dpm / 100 cm^2 of β-γ if it meets the requirements of the *DOE Rad Con Manual*, Table 2-2. For the *Rad Con Manual* limits, refer to the *LLNL Health & Safety Manual*, Supplement 33.02, Appendix D.
Free liquids in solid waste	Only residual liquids in well drained containers are acceptable, provided that is no more than 1 inch of liquid in any container and no more than 2 liters in a 55-gallon drum or 8 liters in a SWB.
Criticality safety	WIPP limits this to 200 Pu-239 fissile gram equivalents (FGEs) per drum and 325 FGE per SWB. HWM limts any container to 120 gram sof U-233, U-235, and Pu-239. Larger amounts per container may be acceptable by arrangement with HWM, prior to packaging.
Classified waste	Classified TRU waste is not accepted for disposal at WIPP. Consult your RCA and an Authorized Derivative Declassifier for assistance in declassifying your waste.
Surface dose rate	The combined β,γ, and neutron dose rate anywhere on the surface of a TRU waste container may not exceed 200 mrem / hr (the “contact-handled” limit).
Pu-239 equivalent activity	WIPP limits this to 80 Plutonium Equivalent Curies (PE-Ci) per 55-gallon drum or 130 PE-Ci per SWB. HWM further limits this to 6 PE-Ci per container. Larger amounts, up to 46 PE-Ci may be acceptable by arrangement with HWM, prior to packaging.
Tritium	<1000 Ci. This is an HWM operational limit. On a case-by-case basis, HWM may be able to accommodate higher quantities. Consult your HWM field technician.
Pyrophoric materials	Radioactive pyrophorics are limited to <1% by weight of the payload container. Non-radioactive pyrophorics shall be rendered non-reactive prior to placement in the waste container.
Mixed wastes	TRU waste shall contain hazardous constituents only as co-contaminants with transuranics. Waste exhibiting corrosive, reactive, or ignitable characteristics shall be treated to remove the hazardous characteristics. Consult your Environmental Analyst for guidance.
CA-only hazardous waste	Allowed if hazard characteristic is toxic only.
Explosives, corrosives, ignitables, reactives and compressed gases	Not allowed.

Criteria for acceptance of TRU waste (continued)

Criterion	LLNL Criteria
PCBs	TRU waste contaminated with polychlorinated biphenyls (PCBs) concentrations ≥50 ppm are not allowed.
Gas generation	It is difficult to transport higher activity wastes if radiolytic hydrogen or methane generation is possible. Consult your RCA before packaging such wastes.
Flammable VOCs	Concentration of flammable volatile organic compounds (VOCs) is limited to 500 ppm in the headspace of a waste container. Consult your RCA or Environmental Analyst if you think this will be an issue.
Gas confinement layers	Record the number of gas confinement layers on the Parcel Card. Close bags only with the twist-and-tape or fold-out-tape methods. Heat-sealed bags must have a filter vent. Consult your RCA.
Sealed rigid containers	Sealed containers >4 liters are prohibited unless a filter vent is installed. Consult your RCA.
Thermal power	TRUPACT-II limits thermal power to 40 watts from all payload containers loaded into a TRUPACT-II. This limit necessarily applies to each payload container (drum or SWB).

TRU mixed waste

TRU mixed waste requires special handling if it exhibits the characteristics of reactivity, corrosivity, or ignitability. Always notify HWM before generating such waste. Such waste is not certifiable for disposal at WIPP, and would require treatment to remove any of these characteristics. Unless such treatment is available, such waste cannot be stored at an HWM facility.

WIPP WAC

TRU waste must also meet the Waste Isolation Pilot Plant (WIPP) waste acceptance criteria or be marked as nonconforming. HWM may accept nonconforming waste if it cannot be made to meet the WIPP WAC at the present time.

For a detailed discussion of HWM's TRU Waste Acceptance Criteria, refer to the table, above, and to class materials from EP0021, TRU Waste Generation and Certification Program. For assistance in determining the acceptability of your waste, contact the TRU waste radiological characterization analyst, your environmental analyst, or HWM field technician.

3.3.2 Documentation

Documentation Package for Certifiable TRU Waste

NOTICE

Before transuranic waste can be transferred from the workplace or WAA or CWAA to an HWM facility, a TRU documentation package must be completed.

A TRU documentation package is the required information that tracks the transuranic waste from its generation through its transport to an HWM facility.

The TRU documentation package consists of:

- Waste Parcel Card (WPC) for each parcel requisition
- Waste Disposal Requisition (WDR).

Container Inspection

As a generator, you are responsible for using a container that has passed inspection either by you or someone to whom you delegate the task. The inspection results must be recorded on the WDR. The inspector must have been trained by taking and passing the course EP0021, TRU Waste Generation and Certification Program.

Waste Parcel Card (WPC)

As a generator, you are responsible for filling out the Waste Parcel Card as soon as the transuranic waste is placed into the parcel.

The card asks for information pertaining to:

- description of the different waste items. (You may attach a checklist of authorized components from your PKE.)
- grade of plutonium or total radionuclides in all the items in the parcel
- RCRA or CA hazardous materials, if present in the parcel, must be handled as TRU mixed waste.

See **Appendix F** for an example of a LLNL Radioactive Waste Parcel Card and its continuation card.

Waste Disposal Requisition (WDR)

The WDR form is a document on which the generator transmits required HWM information to properly manage waste. It is an internal tracking device that assures that HWM meets its cradle-to-grave tracking responsibilities. Its proper completion starts the process of removing the waste from the workplace. It becomes part of the documentation package.

Before you remove your waste from your workplace you must complete a Waste Disposal Requisition (WDR) (**Appendix B**).

Source Codes define the process that created your waste (see **Appendix B**). Choose the one that best describes your process. If you need help, contact your HWM field tech or your environmental analyst.

3.3.3 Certification

Certifiable TRU Waste

Certifiable TRU waste is that which is generated as a certifiable waste stream under the TRU Waste Program.

The Certification and Quality Assurance Plan defines the QA program as it applies to waste certification and characterization.

In the certification program, there is an auditable system in place for verifying that the TRU waste generator has properly identified, characterized, segregated, packaged, and certified the waste.

Primarily, certifiable waste comes from the following buildings:

- Plutonium Facility (Building 332)
- Heavy Element Facility (Building 251).

Noncertifiable TRU Waste

All TRU waste generated as a waste stream for which a certification plan has not been developed is noncertifiable TRU waste. An example is a HEPA filter contaminated with TRU radionuclides. A plan for certifying HEPA filters is being developed. Another example would be classified waste.

NOTICE

HWM will not accept noncertifiable waste for storage in its facilities.

3.3.4 Waste Preparation

Preapproved Packaging Procedures

NOTICE

Certifiable waste must be generated and managed in accordance with specific preapproved transuranic waste handling and packaging procedures.

These preapproved procedures are usually found as appendices to the Facility Safety Procedure (FSP) or the Operational Safety Procedure (OSP). Examples of preapproved procedures are:

- B332 FSP, Appendix H: “TRU Waste Handling and Packaging Procedures”
- B251, Technical Implementing Procedures TIP-HEF-007 through TIP-HEF-011.

Some currently uncertifiable wastes have preapproved packaging and handling procedures. For example, the B332 FSP covers HEPA filters, which are not yet certifiable waste.

Labeling

DOE Order 5820.2A requires that all radioactive waste containers be labeled. Use the yellow and white radioactive waste labels on all nonmixed TRU waste and the red and yellow mixed waste labels on all mixed TRU waste.

All labels can be obtained from Stores. The label should be filled in and affixed to your container as soon as you begin adding waste to it. The label should be updated as needed every time waste is added.

Be sure the label is filled out legibly and accurately and is clearly visible on the container. Incomplete labels or inaccurately labeled waste containers are out of compliance with regulations and can not be accepted at the WAA or HWM.

Strike-throughs are not allowed on the label. If changes are necessary, remove the label from the container and start over with a new one. Do not place a new label over the old one.

Appendix D contains examples of the labels that must be affixed to waste containers. Note how each one is filled out.

If you have questions, please contact your HWM field tech or environmental analyst.

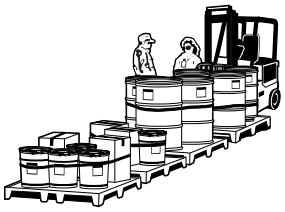
Segregating

Mixed TRU waste should be segregated from nonmixed TRU waste (mixed waste contains RCRA-regulated components). TRU waste contaminated with California-only hazardous components should always be segregated from nonmixed TRU waste, and if possible, from RCRA TRU mixed waste.

TRU waste and TRU mixed waste should also be segregated from hazardous, nonhazardous, low-level certified, low-level noncertified, low-level mixed, and medical wastes.

In addition, solids, liquids, and gases (aerosol cans, gas cylinders) should be placed in separate containers and kept in separate containment areas.

Transfer to WAA



Before your TRU waste can be moved to a WAA or CWAA, you should check to see that the following have been taken care of:

- you as the generator have characterized the waste to the best of your knowledge on the parcel cards and WDR
- the waste is in a suitable, properly sealed container
- the container is clean and free of external contamination
- the proper label has been completely and accurately filled out and affixed to the container
- the WDR has been filled out and signed by you, the generator
- the WDR is submitted to HWM for approval.

Approval Process

Contact your HWM field tech so that you can jointly review the container and complete the paperwork process. Your HWM field tech will check the waste package to ensure that the waste has been put into the proper container, is correctly labeled, and the required information has been included on the WDR. The TRU waste radiological characterization analyst will also check and approve the paperwork.

The HWM field tech will forward the WDR to HWM for further processing. You will be notified by the field tech if there are any discrepancies that need to be corrected. If the waste documentation package is approved, a copy will be returned to you.

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3.4 Mixed Waste

Topic	Subtopics
3.4.1 Characterization **Pages 101 - 104**	• *Process Knowledge* • *Radionuclide Determination* • *Sampling and Analysis* • *Hazardous and Radionuclide Characterization*
3.4.2 Documentation **Pages 105 - 109**	• *Waste Disposal Requisition (WDR)* • *Waste Evaluation Form (WEF)* • *Material Safety Data Sheet (MSDS)* • *CES Chain of Custody and Analytical Instructions (COC)* • *RMMA Room Status Change* • *WDR Sign-off*
3.4.3 Waste Preparation **Pages 110 - 115**	• *Packaging* • *Labeling* • *Segregating* • *Storage Time Limits* • *Transfer to WAA or CWAA* • *Approval Process*

Training Requirements: As a generator of mixed waste, you are required to take EP0006, *Hazardous Waste Generation and Certification*, and thereafter, you must annually complete the training course, EP0006-R, *Hazardous Waste Generation and Certification Review*.

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3.4.1 Characterization

Process Knowledge

Mixed waste generated at LLNL can be characterized by the waste generators through their knowledge of the process that generated the waste.

Because mixed waste contains both hazardous and radioactive components, check the EPA and DTSC lists in **Appendix A** to see if any of the chemical constituents are on the lists and if your waste exhibits any or all of the hazardous characteristics of ignitability, corrosivity, reactivity, or toxicity. Also refer to Section 3.1.1, "Tools for Characterizing Hazardous Waste."

A WEF shall be completed for all routine LLW mixed waste streams. A PKE is required for TRU mixed waste.

Radionuclide Determination

As a generator of mixed waste, you are responsible for identifying all radionuclides present in your waste stream and indicating what they are on the WDR.

Radionuclide information is obtained from the analytical results or from generator calculations that are based on the curie content of each component in the waste. See Section 3.3.1 for a detailed description of TRU waste radionuclide determination if you have mixed TRU waste or Section 3.2.1 if you have LLW.

Sampling and Analysis

If the above methods are not adequate for characterizing the hazardous and radioactive components of your mixed waste, you must arrange, with your HWM field tech, to have it sampled and analyzed.

Waste must be adequately characterized before it can be transported to an HWM facility. Your characterization will allow HWM to safely handle, segregate, store, treat, or send the waste off-site for disposition according to HWM's operating requirements.

You should provide the sampling personnel as much information about the composition of your waste as possible. This exchange of information is important because, before collecting the sample, the HWM sampling or field tech reviews the sampling method and strategy to determine if they are safe and appropriate for the waste.

There are several sampling methods for the various kinds of waste. The sampling method and device used to sample a container of waste depend on the generator-supplied information based on knowledge of the waste form.

Sampling and Analysis Worksheet

The Sampling and Analysis Worksheet (SAW) is used for waste certification purposes when there is insufficient generator knowledge or analytical information available to certify the waste. The SAW documents the specific sampling procedure and analyses that need to be conducted to demonstrate compliance with *The Nevada Test Site Waste Acceptance Criteria* (*NTSWAC*) (latest version). Contact the HWM field tech for assistance in completing the SAW. The SAW form can be found in **Appendix F**.

Special considerations when dealing with TRU mixed waste

NOTICE

Generator process knowledge is critical to acceptable waste characterization of mixed waste.

It is important to prevent the creation of waste which contains both hazardous constituents and TRU radionuclides, because of limited storage facilities for mixed TRU waste.

TRU mixed waste requires special handling if it exhibits the characteristics of reactivity, corrosivity, or ignitability. Always notify HWM before generating such waste. Such waste is not certifiable for disposal at WIPP, and would require treatment to remove any of these characteristics. Unless such treatment is available, such waste cannot be stored at an HWM facility.

Hazardous and Radionuclide Characterization

Mixed waste contains both radioactive compounds and at least one RCRA-listed hazardous constituent or exhibits a RCRA hazardous characteristic. See section 3.1.1 for a detailed description of hazardous waste characterization, Section 3.2.1 for low-level waste characterization, and Section 3.3.1 for TRU waste characterization.

Short-lived isotopes

The short-lived isotopes, such as phosphorus-32, phosphorus-33, and sulfur-35 should be segregated. These wastes will be stored by HWM for decay.

NRC exemptions for radioactive waste containing tritium or carbon-14

For Nuclear Regulatory Commission (NRC) exemptions for certain radioactive wastes, see Section 3.6, Special Case Waste, “Animals” contaminated with tritium or carbon-14 and “Scintillation cocktails” for special exemptions on fluids contaminated with tritium and carbon-14.

Criteria for Waste Acceptance

The general criteria for acceptance of mixed waste are outlined in the chapters on low-level waste and transuranic waste. Because of the limited number of disposal options, please consult your radiological characterization analyst for specific guidance on the application of the acceptance criteria to your waste.

3.4.2 Documentation

Waste Disposal Requisition (WDR)

The WDR is an internal tracking device that assures that HWM meets its cradle-to-grave tracking responsibilities. Its proper completion starts the process of removing the mixed waste from the workplace.

You are responsible for completing the WDR as soon as your mixed waste is ready for removal. Your HWM field tech can assist you in filling it out.

Before you remove your waste from your workplace you must complete a Waste Disposal Requisition (WDR) (**Appendix B**).

Source Codes define the process that created your waste (see **Appendix B**). Choose the one that best describes your process. If you need help, contact your HWM field tech or your environmental analyst.

In addition, information must be provided regarding the creation and processes associated with waste generation. This information should be written on the WDR, or attached as necessary.

Since mixed waste contains both hazardous and radioactive components, the WDR sections pertaining to hazardous waste and those pertaining to radioactive waste must be completed.

When the generator or container custodian signs the WDR, they certify that the information provided is correct, and that the waste container has been packaged in accordance with all applicable LLNL mandated hazardous waste, TRU waste, LLW, and quality assurance programs.

Waste Evaluation Form (WEF)

The Waste Evaluation Form (WEF), can be found in **Appendix F** along with instructions for filling it out. The WEF is completed by HWM with information supplied by the generator. The generator signs the WEF usage card signifying the information, as stated, is correct. The WEF is used to profile preapproved waste streams. The WEF will be available electronically and if you have a preapproved waste stream, it will be used to expedite the process of filling out your waste disposal requisition. Consult your HWM technician for information about the WEF. All routinely generated mixed waste must be documented on the WEF.

Toxic air contaminants

If you have generated a mixed waste, review the Toxic Air Contaminants list (TAC) in **Appendix G**. On the Waste Disposal Requisition (WDR), list any of these compounds present in your waste and note them as TAC in parentheses after the chemical, and estimate the percentage or concentration of the compound.

Material Safety Data Sheet (MSDS)

OSHA regulations require that manufacturers, importers, and employers adhere to its Hazard Communication Standard (HCS) to inform employees of the existence of risks of exposure to hazardous substances in the workplace.

Commonly referred to as the "workers right to know," the HCS requires that Material Safety Data Sheets (MSDS) be distributed to the users of chemicals.

An MSDS is a useful tool in helping generators characterize their waste because the sheets may contain considerable detail regarding hazardous components, physical data, ignitability, reactivity, health hazards, etc.

There is an MSDS for each individual chemical or mixture of compounds. An MSDS is a basic source of information about hazardous chemicals. Each sheet must list several characteristics of the chemical including:

- the chemical identity as used on the container label
- the chemical and common names of all hazardous ingredients
- physical and chemical characteristics of the hazardous ingredients
- physical and health hazards of the hazardous ingredients, including exposure symptoms
- OSHA permissible exposure limit (PEL) and other exposure limits.

Contact your ES&H Team environmental analyst or HWM field tech if you cannot locate an MSDS.

CES Chain of Custody and Analytical Instructions (COC)

Another way to identify your waste is through sampling and analysis. If you choose that method of identification, you are responsible for requesting that your waste be sampled and analyzed. An HWM review chemist or your environmental analyst will review the analytical data and make a determination on the waste's categorization.

Your HWM field tech will assist you in completing a CES Chain of Custody and Analytical Instructions (COC), taking samples, and arranging for the appropriate analysis of your waste.

Within 30 days HWM should receive the results of the analysis. The results are recorded on the WDR and entered into a computerized tracking system by HWM.

The HWM field tech attaches the results of the analysis to the WDR. Contact your HWM field tech for a copy of the results.

For more detailed information about COCs and instructions, see "Sampling and Analysis," Section 3.1.1.

RMMA Room Status Change

NOTICE

When a lab or room changes status from an RMMA to a non-RMMA (or vice versa), HWM requires you to immediately package in accordance with Section 3.3.4 and remove existing hazardous or radioactive waste. Seal your waste container, fill out the WDR, and have the waste removed to the WAA.

Timely implementation of this procedure reduces errors in identifying hazardous or radioactive wastes and avoids unnecessary analyses and confusion over waste status.

WDR Sign-off

If you checked *yes* on the WDR in the box that asks if your waste contains radioactive components, then you are not required to complete the next three parts that ask if your waste was isolated from radioactive contamination.

Intentionally falsifying information on the WDR or WEF could result in serious legal ramifications.

3.4.3 Waste Preparation

Packaging

Packaging your mixed waste in the proper container is extremely important because you need to ensure that you and others who come into contact with the container are not exposed to dangerous situations.

You must not put incompatible wastes into the same container or put waste into a container that may be incompatible with that waste. Such activities could cause dangerous fumes or explosions. Storing incompatible wastes can react with the container and cause it to deteriorate and leak.

All containers need to be approved by LLNL's Hazardous Materials Packaging and Transportation Safety Committee (HMPTS). Generally, all packaging materials provided through Stores or HWM have been approved by the HMPT committee.

A table in **Appendix C** lists the size and composition of the various approved containers. The types of packaging materials that are used within containers for different types of waste are also described.

Plastic may not be used as the primary containment layer for radioactive or mixed waste.

Your HWM field tech can also advise you on the type and size container to use, what wastes can be combined in a container, what wastes need to be segregated from each other for safety and waste minimization purposes, and what kind of packaging materials to use within the container.

Container limits

NOTICE

Aqueous mixed waste is treated on site. In order to meet the RCRA subpart CC rule, volatile organic constituents (VOCs) should be <500 ppm. Please contact your HWM field technician if you think you are going to exceed this.

TRU mixed waste packaging procedures

Certifiable TRU mixed waste must be generated and managed in accordance with specific preapproved transuranic waste handling and packaging procedures.

These preapproved procedures are usually found as appendices to the Facility Safety Procedure (FSP) or the Operational Safety Procedure (OSP), for example:

- B332 FSP, Appendix H: “TRU Waste Handling and Packaging Procedures”
- B251, Technical Implementing Procedures TIP-HEF-007 through TIP-HEF-011.

Labeling

NOTICE

Federal and State regulations require that all mixed waste containers be labeled. Use red and yellow mixed waste labels on all mixed waste.

Labels can be obtained from your HWM field technician. The label should be filled in and affixed to your container as soon as you begin adding waste to the container. The label should be updated as needed every time waste is added.

Be sure the label is filled out legibly and accurately and is clearly visible. Incompletely labeled or inaccurately labeled waste containers are out of compliance with regulations and cannot be accepted at the WAA, CWAA, or HWM.

Strike-throughs are not allowed on the label. If changes are necessary, remove the label from the container and start over with a new one. Do not place a new label over the old one. Note: use the original start date.

Appendix D contains examples of the labels that must be affixed to waste containers. Note how each one is filled out.

If you have questions, please contact your HWM field tech or environmental analyst.

Segregating

NOTICE

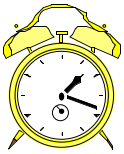
All mixed waste should be segregated by:

- **chemical properties** – Mixed wastes with incompatible chemical properties that could react with each other, such as strong acids and strong bases, must be placed in separate containers and kept in separate spill containment areas.
- **waste type** – In general, mixed waste should be segregated from both non-radioactive and radioactive only wastes. In addition, solids, liquids, and gases (aerosols or gas cylinders) should be placed in separate containers.

Based on HWM operational needs or waste minimization goals, your HWM field tech may suggest other segregation configurations.

Note: No liquids, including liquids already packaged in containers, may be packed in a waste drum containing solid waste and that is marked *SOLID WASTE.*

Storage Time Limits



State and federal RCRA requirements limit the time you may store your waste in the workplace setting (also known as the workplace or satellite accumulation area), and also, the WAA and CWAA prior to sending the waste to a Treatment, Storage, Disposal Facility, such as HWM. Since waste is required to be transferred to HWM within one year from the initial date of accumulation, or 90 days from the date that the container was filled, LLNL practices the following hazardous waste storage limit policy:

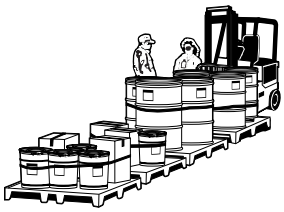
- In the workplace or satellite accumulation area, the maximum waste accumulation time is 9 months or the time it takes to fill a 55-gallon container with hazardous waste (or a 1-quart container with acutely hazardous waste – See Appendix A), whatever comes first. The waste container must then be sealed, the workplace end date needs to be written on the label, and the container is required to be transferred to the WAA or HWM within 3 days.

- In the WAA, the maximum waste storage time is 90 days. This ninety-day clock begins with the workplace end date, since the time period is counted from the time the container quantity limit was reached.

- In the HWM TSDF, waste may be stored for up to an additional year, or additional time based on the site treatment plan (agreement between DOE and DTSC).

Please note that waste being accumulated in the workplace accumulation area needs to be monitored by the operator of the process generating the waste. If you have any questions, please contact your HWM field tech or environmental analyst.

Transfer to WAA



Before your mixed waste can be moved to a WAA or CWAA, you should check to see that the following have been taken care of:

- the waste has been characterized by generators to the best of their knowledge
- the waste is in a suitable container that is properly sealed
- a Health and Safety tech has swiped and surveyed the outside of the container and the container is clean and free of external contamination
- the proper label has been completely and accurately filled out and affixed to the container
- the WDR has been filled out and signed by you, the generator
- the WEF has been filled out and signed by you, the generator.
- the WDR is submitted to HWM for approval
- if analysis is needed, a COC has been filled out
- an MSDS is included for unused manufactured chemical product waste
- container has been swiped and surveyed by the area Health and Safety tech for external radioactive contamination.

If sampling is required it will be done at the WAA.

Contact your HWM field tech to review the container and its associated paperwork.

Approval Process

Contact your HWM field tech so that the two of you can complete the paperwork process. Your HWM field tech will check the waste package to ensure that the waste has been put into the proper container, is correctly labeled, the required information has been included on the Waste Disposal Requisition, and determine if any sampling and analysis is required.

The HWM field tech will forward the WDR to HWM for further processing. You will be notified by the field tech if there are discrepancies that need to be corrected.

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3.5 Nonhazardous Waste

Topic	Subtopic
3.5.1 Characterization **Pages 119 - 120**	• *Process Knowledge* • *Sampling and Analysis*
3.5.2 Documentation **Pages 121 - 123**	• *Waste Disposal Requisition (WDR)* • *Waste Evaluation Form (WEF)* • *CES Chain of Custody and Analytical Instructions (COC)* • *WDR Sign-Off* • *Confirmation of RMMA Status*
3.5.3 Waste Preparation **Pages 124 - 127**	• *Packaging* • *Labeling* • *Segregating* • *Transfer to WAA* • *Approval Process*

Training Requirements: Nonhazardous municipal waste that can be disposed of in a municipal landfill is not addressed in this document, and its generation carries no requirement to take a training course.

However, if you are generating nonhazardous industrial waste that cannot be disposed of in municipal landfill or by municipal wastewater treatment, you are required to take the training course EP0006, *Hazardous Waste Generation and Certification*, and thereafter, you must annually complete the training course EP0006-R, *Hazardous Waste Generation & Certification Review*.

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3.5.1 Characterization

Nonhazardous industrial waste managed by HWM

Industrial wastes can contain RCRA and/or California Hazardous Waste Control Law (HWCL) hazardous constituents that are below threshold regulated hazardous waste limits, but exceed permissible Livermore Water Reclamation Plant (LWRP) permit or municipal landfill limits.

An example of such waste at LLNL is retention-tank water with concentrations of constituents that are not high enough to be classified as hazardous, but because they exceed permissible limits in the LWRP permit, and because of restrictions promulgated by the City of Livermore Sewage Treatment Plant, cannot be discharged into the sanitary sewer system.

Nonsewerable wastewater is either shipped off site as nonhazardous or treated on site so that it meets internal sewer discharge limits.

Nonfriable asbestos is also managed by HWM.

Wastes not meeting the above criteria (and not hazardous or radioactive) are not managed by HWM.

Process Knowledge

NOTICE

Many nonhazardous wastes that are generated at LLNL can be primarily characterized by your knowledge of the process that generated the waste. Retention-tank water must meet the sewer release limits and be approved for release. This process involves sampling and analysis.

Waste found to contain listed hazardous materials above regulatory levels or to possess hazardous characteristics must be identified as hazardous waste.

You can also use EPA and DTSC lists of hazardous wastes to determine if the wastes demonstrate any or all of the hazardous characteristics of *ignitability*, *corrosivity*, *reactivity*, or *toxicity*. See Section 3.1.1 for information concerning the determination of a waste's hazardous characteristics.

Sampling and Analysis

NOTICE

If generator knowledge is not adequate for characterizing your waste, contact your environmental analyst or HWM field technician for assistance in having your waste analyzed. See Section 3.1 for additional information regarding sampling and analysis.

Waste must be characterized before it can be transported to an HWM facility. Your characterization will allow HWM to safely handle, segregate, store, treat, and send the waste off-site for disposition according to its operating permit requirements.

For unknown wastes, your environmental analyst can provide you guidance on characterization procedures.

Verification

Approximately ten percent of all incoming waste may be randomly selected to be verified through usual inspection or analysis. Additionally, ten percent of waste shipped from consolidation WAAs directly off site is verified.

3.5.2 Documentation

Waste Disposal Requisition (WDR)

The WDR is an internal tracking device that assures that HWM meets its cradle-to-grave tracking responsibilities. Its proper completion starts the process of removing the waste from the workplace.

You are responsible for completing the WDR as soon as your nonhazardous waste is ready for removal. Your HWM field tech can assist you in filling it out.

Before you remove your waste from your workplace, you must complete a Waste Disposal Requisition (WDR) (**Appendix B**).

Source Codes define the process that created your waste (see **Appendix B**). Choose the one that best describes your process. If you need help, contact your HWM field tech or your environmental analyst.

In addition, information must be provided regarding the creation and processes associated with waste generation. This information should be written on the WDR, or attached as necessary.

Detailed information and instructions on how to fill out WDRs are in **Appendix B**. When necessary, ask your HWM field tech for clarification.

Waste Evaluation Form (WEF)

The Waste Evaluation Form (WEF), can be found in **Appendix F** along with instructions for filling it out. The WEF is completed by HWM with information supplied by the generator. The generator signs the WEF usage card signifying the information, as stated, is correct. The WEF is used to profile preapproved waste streams. The WEF will be available electronically and if you have a preapproved waste stream, it will be used to expedite the process of filling out your waste disposal requisition. Consult your HWM technician for information about the WEF. All routinely generated mixed waste must be documented on the WEF.

CES Chain of Custody and Analytical Instructions (COC)

If you need to identify your nonhazardous waste through sampling and analysis, contact your HWM field tech. The HWM tech will help you complete a CES Chain of Custody and Analytical Instructions (COC), taking samples, and arranging for the appropriate analysis of your waste.

Within 30 days, HWM should receive the results of the analysis. The results are recorded on the WDR and entered into a computerized tracking system managed by HWM.

The HWM field tech attaches the results of the analysis to the WDR. Contact your HWM field tech for a copy of the results.

For more detailed information about COCs and instructions see “Sampling and Analysis,” Section 3.1.1.

WDR Sign-off

If you checked *no* in the WDR that asks if your waste was generated in a room or lab that is a Radioactive Materials Management Area (RMMA), then your signature certifies that the statements you made are correct, and your waste contains no radioactive components.

Confirmation of RMMA Status

If your nonhazardous waste was generated in a room or lab that is a RMMA, there are two critical questions on the WDR that must be answered:

- Was the waste kept isolated from any operation that could have produced radioactive contamination?
- Was the waste exposed to particle beams capable of inducing radioactivity by activation?

If the answer to the first question is *yes* and the answer to the second is *no*, your signature certifies that the statements you made are correct and your waste contains no radioactive components.

If the answer to the first is *no* or the second is *yes*, then a full radioactive analysis is required. If the analysis shows that your waste is radioactive, check the appropriate box on the WDR indicating that the waste is radioactive or mixed.

Intentionally falsifying information on the WDR could result in serious legal ramifications.

RMMA room status change

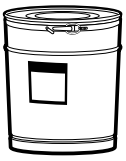
NOTICE

When a lab or room changes status from an RMMA to a non-RMMA (or vice versa), HWM requires you to immediately package and remove existing nonhazardous waste. Follow container sealing procedures, fill out the WDR, and have the waste moved to the WAA or CWAA.

Timely implementation of this procedure reduces errors in identifying nonhazardous wastes and avoids unnecessary analyses and confusion over waste status.

3.5.3 Waste Preparation

Packaging



Packaging requirements are not closely specified by the Department of Transportation (DOT) for nonhazardous wastes. In general, strong containers are recommended to prevent the unintentional release of contents under conditions normally incident to transportation.

Typically, LLNL uses the same types of containers as for hazardous wastes (see Appendix C), since these are readily available through Stores, meet LLNL's Hazardous Material Packaging and Transportation (HMPT) Committee approval, and don't require additional procurement efforts.

Your HWM field tech can also advise you on the type and size container to use, what wastes can be combined in a container, what wastes need to be segregated from each other for safety and waste minimization purposes, and what kind of packaging materials to use within the container.

Liquid waste

Pack liquid waste in separate containers from solid waste and gaseous waste. No liquids, including liquids already packaged in containers, may be packed in a waste drum containing solid waste and that is marked *SOLID WASTE.*

Labeling

Use the green nonhazardous waste label on all nonhazardous industrial waste.

Nonhazardous waste labels can be obtained from Stores. The label should be completed and affixed to your container as soon as you begin adding waste to the container. The label should be updated every time waste is added.

Be sure the label is filled out completely and accurately and it is clearly visible. Incompletely labeled or inaccurately labeled waste containers are out of compliance with LLNL policy and cannot be accepted at the WAA or by HWM.

Strike-throughs are not allowed on the label. If changes are necessary, remove the label from the container and start over with a new label. Do not place a new label over the old label.

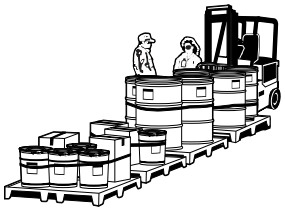
Appendix D contains examples of the labels that must be affixed to waste containers. Note how each one is filled out.

If you have questions, please contact your HWM field tech or environmental analyst.

Segregating

Nonhazardous waste should be segregated from low-level radioactive, mixed, TRU, medical, and hazardous wastes. In addition, solids, liquids, and gases (aerosols or gas cylinders) should be placed in separate containers.

Transfer to WAA



Before your nonhazardous waste can be moved to a Waste Accumulation Area (WAA) or CWAA, you should check to see that the following have been taken care of:

- the waste has been characterized to the best of your knowledge
- the waste is in a suitable, properly sealed container
- the container is clean and free of external contamination
- the proper label has been completely and accurately completed and affixed to the container
- the WDR has completed and signed by you, the generator
- the WDR is submitted to HWM for approval
- if analysis is needed, a COC has been filled out.

If sampling is required, it will be done at the WAA or the CWAA.

Contact your HWM field tech to review the container and its associated paperwork.

Approval process

Contact your HWM field tech so that you can jointly complete the paperwork. So that you can transfer your waste to a WAA or CWAA, your HWM field tech will check the waste package to ensure that the waste has been put into the proper container, is correctly labeled, the required information has been included on the Waste Disposal Requisition, or if any sampling and analysis is required.

The HWM field tech will forward the WDR to HWM for further processing. You will be notified by the field tech if discrepancies need to be corrected. If the waste documentation package is approved, a copy will be returned to you.

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3.6 Special Case Waste

Topic	Subtopics
3.6.1 Conditional Waste **Pages 131 - 155**	• *Conditional Waste Defined* • *Accountable Materials* • *Classified Waste* • *Controlled Substances* • *Fluorescent Tubes and Ballasts* • *Fuming Acids* • *Gas Cylinders* • *HEPA Filters* • *Medical Waste* • *Animals* • *Nitric Acid* • *Peroxide-forming Materials* • *PCBs* • *Scintillation Cocktails* • *Sewer Waste* • *Shielded Items* • *Unknown Waste*
3.6.2 Unacceptable Waste **Pages 156 - 157**	• *Categories of Unacceptable Waste*

Training Requirement: As a generator of waste at LLNL, you are initially required to take the training course EP0006, *Hazardous Waste Generation and Certification*, and thereafter, you must annually complete the training course EP0006-R, *Hazardous Waste Generation & Certification Review*. Depending on the type of conditional waste you are be generating, you may be required to take additional courses.

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3.6.1 Conditional Waste

Conditional Waste Defined

Conditional wastes are specific kinds of wastes that require special handling so that HWM can accept them into its facilities. In many cases the wastes fall into categories already discussed (hazardous, low-level, etc.). However, because of some unique characteristics, other considerations need to be given or additional steps must be taken before they can be treated or disposed of. If you have questions regarding special case waste, please contact your HWM field tech.

Accountable Materials

Before transferring waste from a Materials Balance Area (MBA) to HWM, certain requirements must be met. Contact Materials Management for specific procedures. In addition, the generator custodian must request and complete a Controlled Materials Transfer Form from Materials Management.

See the following page for a sample form.

Classified Waste

Wastes defined as classified for national security reasons, cannot be treated, packaged, shipped or stored like other waste generated at LLNL.

A generator must determine within his own facility how to handle classified waste.

In addition, a generator of classified waste should contact Materials Management for the required packaging and storage procedures.

Every effort should be made to declassify waste before it is submitted to HWM. Low level classified waste may be accepted for disposal at NTS.

Prior to HWM accepting classified waste, the generator must provide a detailed declassification plan that will be approved by HWM.

Contact an authorized derivative declassifier from your program or Safeguards and Security to take the necessary steps to declassify your waste to the maximum extent possible.

Contact your HWM field tech for the proper management of your classified waste.

LAWRENCE LIVERMORE LABORATORY, LIVERMORE MATERIALS MANAGEMENT

CONTROLLED MATERIAL TRANSFER FORM

NUMBER

☐ REGISTERED ASSEMBLY ☐ PARTS ☐ CONTAINING S S MAT'L.

	CARD CODE	MAT'L TYPE	MAT'L FORM	MAT'L DESC.	CHARGE TO MBA	DATE MO. DAY YR.	REFERENCE NUMBER	ALLOT CODE	PART OR SERIAL NUMBER YR.	SERIAL	REV.	IDENTITY	CLASS	STATUS CODE	DESCRIPTION (VIAL #)	WEIGHT NET	S S	ISOTOPE
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
13																		
14																		
15																		

FROM: _____ TO: _____ HOLD FOR: _____ REQUESTED BY: _____

RELEASE AUTHORITY: _____ CONTROLLED MATERIAL TAG NO.: _____ ASSEMBLY: _____ SHOT: _____

REFERENCE: _____ REMARKS: _____

MEASUREMENT METHOD

CONTAINER IDENT.: _____ _____ ITEM IDENT. S S NET WEIGHT: % _____ _____ HOW _____ OTHER VERIF

VERIFY SERIAL #: _____ _____ $\frac{B+G}{G}$ RATIO ISOTOPE: % _____ _____ HOW

NET WEIGHT: ± _____ _____ ASS'Y. VERIF. ACCEPTED S. WTS: _____

COPY 1

NUMBER

LL 591 (REV. 7/68) (INTERNAL TRANSFER COPY DISTRIBUTION: #1 WHITE, ACCOUNTABILITY REP.; #2 GREEN, MBA RECEIVING; #3 PINK, MBA RELEASING; #4 YELLOW, SUSPENSE)

Controlled Substances

According to the Bureau of Narcotic Enforcement Office in Sacramento: "A controlled substance or a drug precursor submitted as waste but containing contaminants less than one third of the total volume is considered to be pure product and not waste. If the contaminants exceed one third of the total volume, the material is considered contaminated and must be managed as waste." Therefore, HWM will only receive and dispose of all waste considered "contaminated" under this definition.

The HWM Field Operation Supervisor—Main Site will communicate and coordinate the following disposal guidance to the affected programs and their respective field technicians to help identify those controlled substances considered to be pure:

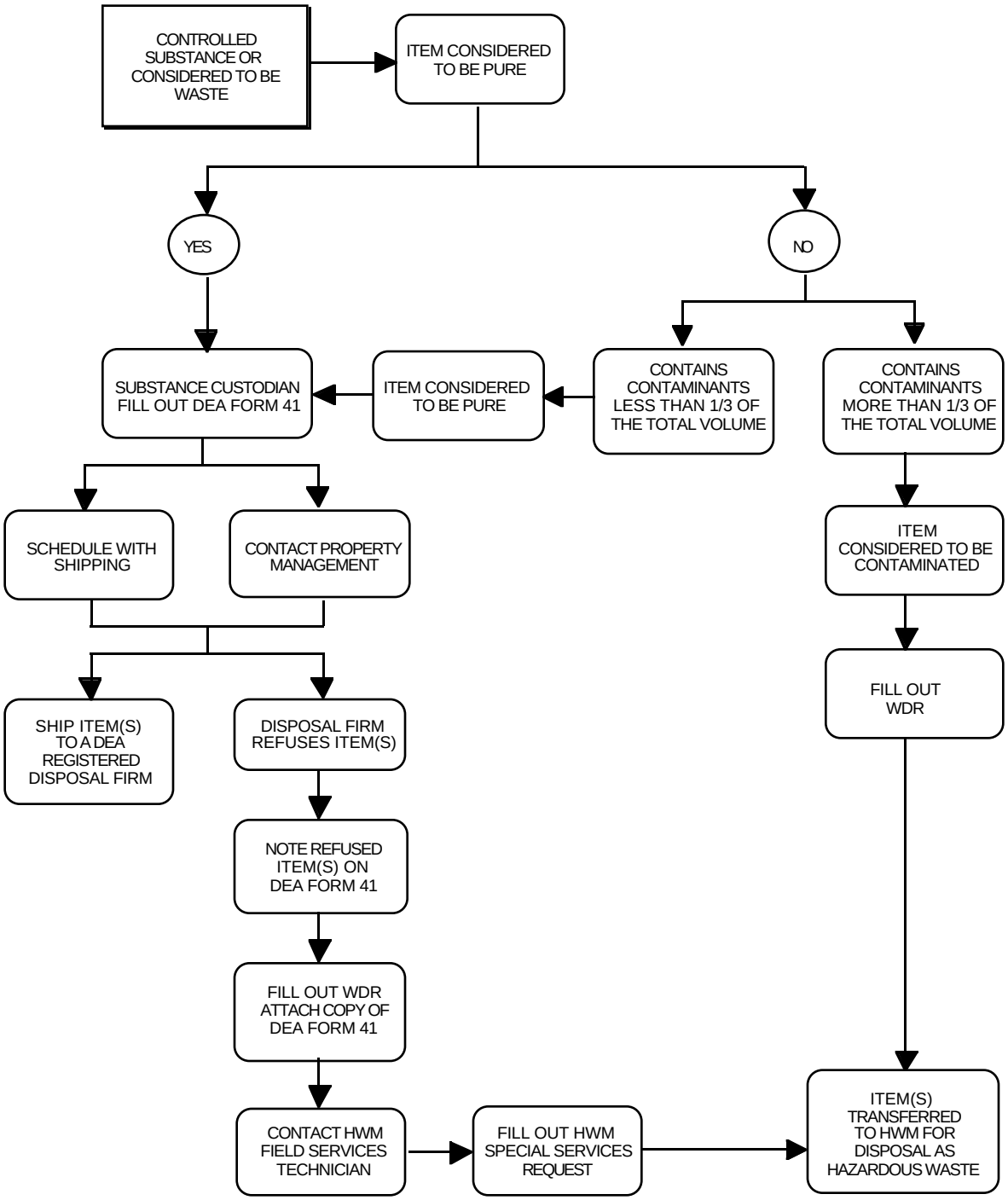
- If an item is a controlled substance, and is considered to be pure, the Program Substance Custodian will fill out Drug Enforcement Agency (DEA) Form 41, "Registrants Inventory of Drugs Surrendered" and a shipping document for all items to be sent to a pharmaceutical disposer registrant for disposal.
- The Program Substance custodian should make arrangements to take the substance to shipping and contact Property Management Inventory Manager at 4-0514. Property Management will witness the completed form and the substance's mailing.
- If for any reason, such as Hazard Class Shipment to a registered disposal firm is not allowed, Property Management will indicate on DEA Form 41 which item(s) is(are) to be disposed of as hazardous waste.
- The Program Substance Custodian will contact their HWM field tech to fill out an "HWM Special Services Request" form to have the item picked up by the HWM Special Services Team to maintain chain-of-custody for the item until it is disposed of.
- The HWM Characterization Chemist will check the WDR for controlled substances or drug precursors.

Controlled Substances (cont.)

- If the HWM Chemist notes the existence of a controlled substance on the WDR without a copy of DEA Form 41 attached, the WDR will be stamped "discrepancy" and an HWM Special Services Request will be filled out and submitted to the HWM Special Services Team. The team will contact the generator or visit the location where the controlled substance was used to inspect the item in question to determine if the item is pure.
- If the item is determined to be contaminated, the discrepancy will be cleared from the WDR and the item will be allowed to be transported to HWM for disposal.

See the flowchart on page 134.

CONTROLLED SUBSTANCES AS WASTE



Fluorescent Tubes and Ballasts

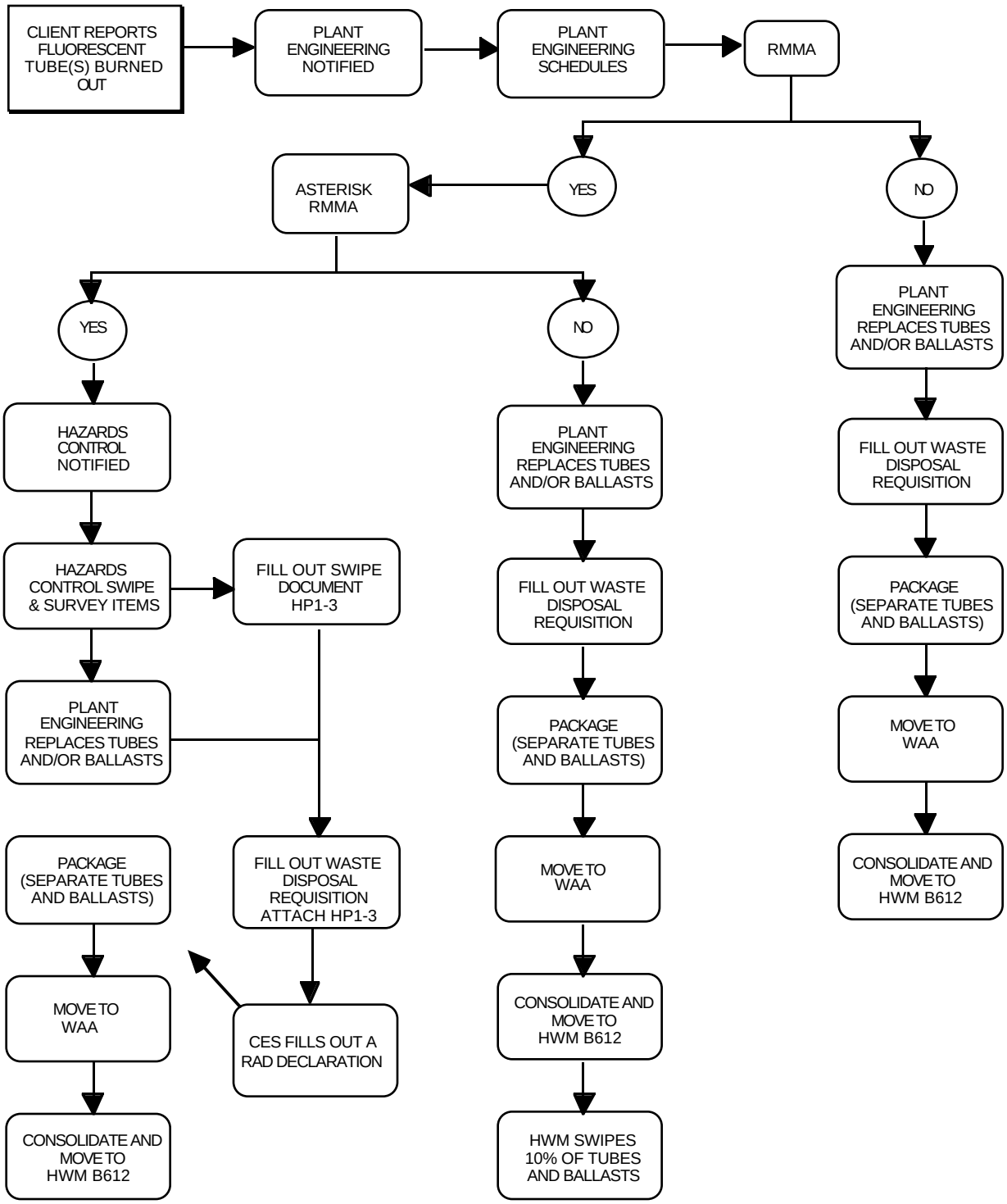
Fluorescent tubes and ballasts are managed in a similar manner but, for waste handling purposes, they must be segregated and packaged separately.

- Tubes must be separated from ballasts for packaging
- Tubes and ballasts from RMMAs should be segregated from non-RMMAs
- Contaminated ballasts should be segregated from non-contaminated ballasts
- Broken or leaking capacitors from ballasts containing PCBs should also be segregated and managed as PCB waste (see PCBs, pg. 146). Ballasts labeled as being PCB-free are not handled in this manner.

Master list of RMMA rooms

Where there is potential for radioactive contamination of the lighting in a room in a Radioactive Materials Management Area (RMMA), an asterisk will indicate such on the most current Master List of RMMA rooms (published by Hazards Control Department). See flowchart on page 134.

FLUORESCENT TUBE AND BALLAST DISPOSAL



Asterisked RMMA rooms

If the room is an asterisked RMMA room, Hazards Control is notified. Hazards Control will send a health and safety technician to survey and swipe the fluorescent tubes and ballasts and determine if they have detectable radioactive contamination.

Tubes and ballasts found to have radioactive contamination will be removed by trained personnel (wearing appropriate personal protective equipment (PPE) as prescribed by Hazards Control) in the presence of a Hazards Control Health and Safety tech. The Health and Safety tech will supervise the labeling and packaging of the tubes and ballasts.

Rooms containing tubes and ballasts found to be free of radioactive contamination will be released for normal operations by Hazards Control. Plant Engineering personnel are free to remove fluorescent tubes and ballasts for labeling and packaging.

In both cases, the generator will write the building and room numbers on the item. The building and room numbers from which the lighting have been removed must also be entered on the Waste Disposal Requisition. The Health and Safety tech will swipe the items and attach a signed swipe tag to them containing the swipe results.

Non-asterisked RMMA rooms

If the lighting is from a non-asterisked RMMA room, the Health and Safety tech's presence is required, but the tubes and ballasts are not swiped. Instead, when they are separated and packaged, a blank RMMA swipe tag is attached and the building and room numbers from which the lighting was removed are written on the container and WDR. Ten percent of the tubes and ballasts from the non-asterisked RMMA rooms will be swiped later at the HWM facility.

Non-RMMA rooms

If the tubes and ballasts are from non-RMMA rooms, the presence of the Health and Safety tech is not required nor do the tubes and ballasts need to be swiped. However, the building and room numbers from which the lighting was removed need to be written on the container and the WDR.

Fuming Acids

Your HWM field tech will instruct you in managing and packaging fuming acids.

Fuming acids, except hydrofluoric acid, should be packaged in DOT-approved glass containers with sealable caps and placed in DOT-approved 37C five-gallon cans. Fuming acid containers larger than five gallons require DOT-approved, special packaging designated by HWM.

If, during your operation or process, fuming acids are diluted to concentrations where the fuming reactivity characteristics disappear, make a note on the WDR. In addition, verbally inform your HWM field tech so that required treatment to meet Land Disposal Restriction (LDR) standards is performed.

Prior to packaging hydrofluoric acid, contact your HWM field tech for instructions.

Gas Cylinders

Check with the Industrial Gases Group of the Materiel Distribution Division to determine the ownership status of a gas cylinder. If the cylinder is owned by an off-site vendor, send it to the Industrial Gases Group.

Every attempt should be made to return gas cylinders to the manufacturer. Most gas cylinders purchased through the Industrial Gases Group are processed via contracts allowing the cylinder to be returned to the vendor. Cylinders modified by users at LLNL or procured other than through the Industrial Gases Group need to be checked for disposal options prior to their arrival at HWM facilities.

For cylinders that cannot be returned to the vendor, contact your HWM field tech to obtain the HWM Special Service Request form. Your HWM field tech will help you fill in the information regarding the type of cylinder you have and forward it to HWM. A team will come to the location of the cylinder and inspect it. Your HWM field tech will then be given instructions on how to prepare the cylinder for disposal.

HEPA Filters

It is the generators' responsibility to provide HWM with specific information about high-efficiency particulate air (HEPA) filters being removed from service. This is so that they can be characterized as hazardous, nonhazardous, radioactive, or mixed waste and be transported to an HWM facility. When the filter is removed, the generator must obtain information about the type of ventilation system in which it was used, and complete a Waste HEPA Filter Information form. The form must accompany each filter. Information required includes, but is not limited to:

- the location and number of HEPA filters in the system
- whether they are in parallel or in series
- the size, air flow source and activity description.

Include a sketch or a description of the ventilation system showing how and where the filters are positioned. The generator should also provide a list of hazardous or radioactive materials used in the area that potentially could have been present in the air stream.

All HEPA filters will be evaluated by HWM, either by sampling, generator knowledge or a combination of both. HEPA filters from dedicated systems (i.e., gloveboxes) will be handled on a case-by-case basis.

For HEPA filters from areas where radioactive materials are present, contact a Health and Safety tech to swipe and survey to determine if the surface of the filters are contaminated with radioactive materials. Contact your field technician or environmental analyst for assistance in disposing of all filters.

Medical Waste

Medical waste is defined as waste generated or produced as a result of the diagnosis, treatment, or immunization of humans or animals in research or in the production or testing of biologicals.

Medical waste occupies two broad categories:

- biohazardous
- sharps.

Biohazardous waste includes items such as dead animals used in research, bandages, clothing, cultures, etc., that have been contaminated by anything considered infectious to humans.

Biohazardous waste that is autoclaved (i.e., steam sterilized to remove infectious agents) becomes nonhazardous waste.

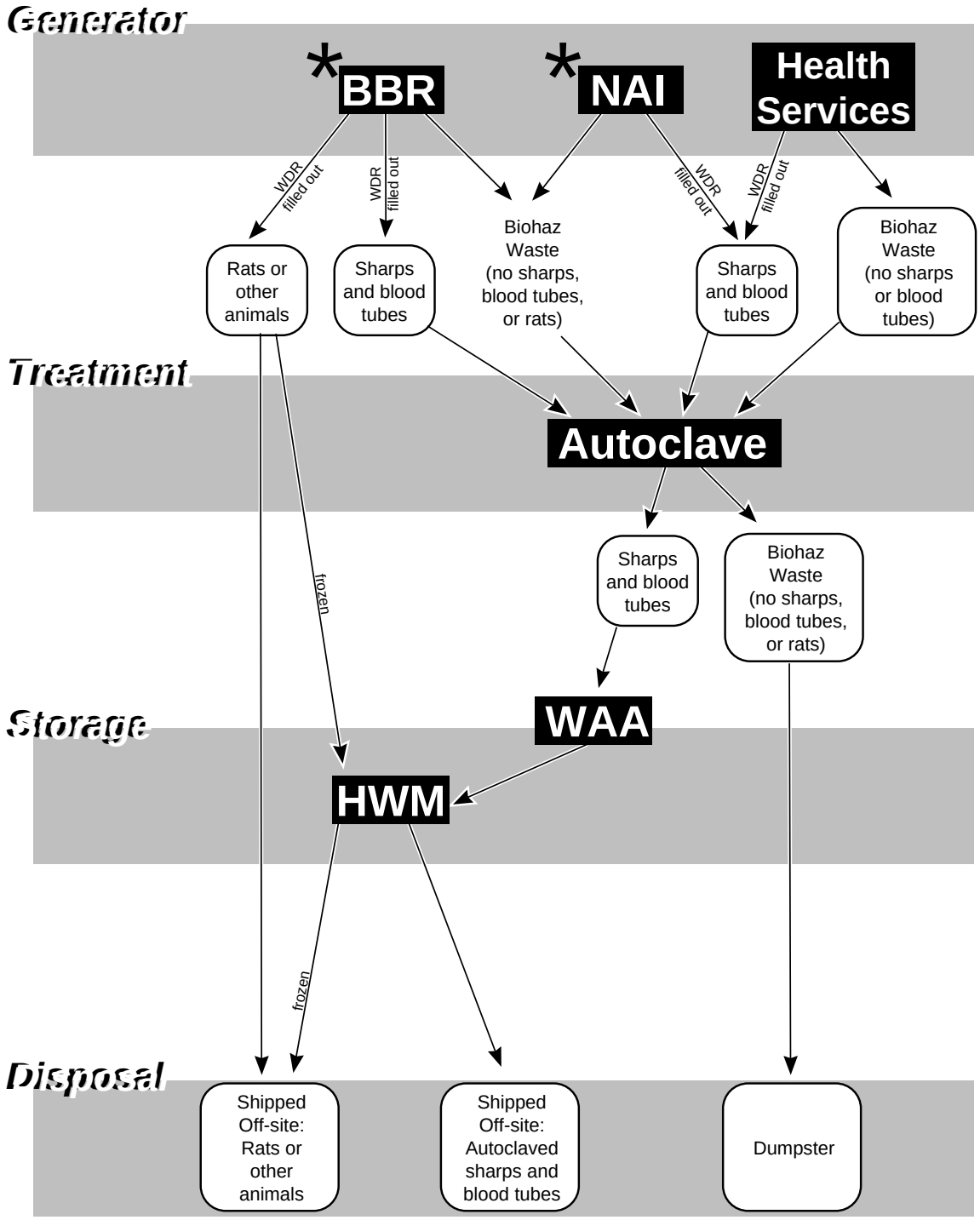
Sharps waste consists of medical or surgical instruments such as hypodermic needles, scalpels, and broken blood vials that have been contaminated by infectious agents.

Sharps waste that is autoclaved is no longer medical waste. However, autoclaved sharps that have not been enclosed in a solid material cannot be disposed of in the municipal trash. Please contact your HWM field tech for guidance in handling.

See the table on the following page that depicts the cradle-to-grave life cycle of medical waste.

Needles and other sharps contaminated with hazardous wastes do not fall under the medical waste requirements, but are treated as hazardous waste. Package sharps in a plastic bag placed inside of a one-gallon metal can. Characterize the sharps based on what they are contaminated with.

Cradle-to-Grave Life Cycle of Medical Waste



* BBR - Biology and Biotechnical Research Directorate
NAI - Nonproliferation Arms Control/International Security Directorate

Medical Waste (cont.)

Medical waste contaminated by other wastes – Such wastes are no longer considered medical wastes but must still be packaged in a fashion that precludes exposure to handlers. Medical wastes contaminated by other wastes include:

- medical waste that has been contaminated by hazardous material is considered hazardous waste
- medical waste that has been radioactively contaminated is considered low-level waste
- medical waste that has been contaminated by hazardous and radioactive constituents is considered mixed waste.

Animals

Keep animals and animal parts frozen and keep whole animals segregated from animal parts; segregate hazardous from nonhazardous and radioactive from non-radioactive.

Packaging requirements vary, depending on the type of contamination that is present in the animal. In general, animals must be kept frozen and stored in plastic bags. Contact your HWM field tech for assistance. Animal carcasses must not be placed in a preservative solution without prior approval of HWM.

The new 10 CFR § 20.2005 guidelines contains an exemption that allows a generator to dispose of radioactive animals and animal parts as if they were not radioactive . The guidelines state that if the animal tissue contains 0.05 microcurie (1.85 kBq), or less, of radioisotopes hydrogen-3 or carbon-14 per gram averaged over the weight of the entire animal, the waste can be disposed of as hazardous or nonhazardous depending on the type of contamination present in the animal.

However, for all such waste, generators must indicate radioactive isotopes and their quantities.

Note: Before starting an experiment with animals, contact HWM or the environmental analyst to assure that there are disposal options available for the resulting waste (e.g., PCBs or dioxins).

Nitric Acid

Spent or contaminated nitric acid with a pH of <2 will require anion testing to determine the presence or absence of other contaminants in the waste. Uncontaminated reagent grade nitric acid requires no testing. If the results of the anion test or generator knowledge indicate that there are no chloride ions present in the nitric acid waste, special packaging requirements must be met.

For solutions of one gallon or less, package in glass; for solutions of one to five gallons, pack in plastic carboys; and for solutions from five to 55 gallons, package in DOT 5C stainless steel drums, special-ordered from HWM.

Peroxide-forming Materials

If you have peroxide-forming materials, or suspect that you have waste materials that, when stored in a container, may form peroxide crystals, contact your HWM field tech to arrange for testing. As a safety precaution do not handle or move the waste container unnecessarily. If the test shows hazardous levels of peroxide-forming materials, HWM will arrange for removal of the container.

The most common problem with peroxide-forming materials is if they are kept after the shelf-life date. These chemicals should be monitored regularly and used up or declared waste before they expire. (See next page for a list of common peroxidizable chemicals.)

Common Peroxidizable Chemicals

acetal
acetaldehyde
acrylaldehyde
acrylonitrile
allyl ether
benzyl ether
benzyl ethyl ether
benzyl n-butyl ether
benzyl napthyl ether
butadiene
chloroacetaldehyde diethylacetal
chlorobutadiene
chlorotrifluoroethylene
crotonaldehyde
cumene
cyclohexene
cyclooctane
decahydronapthalene
decalin
di-n-propoxymethane
diacetylene
dibenzoxybenzene
1,2-dibenzyloxyethane
dicyclopentadiene
1,1-diethoxyethane
diethoxymethane
diethylformate
dimethoxymethane
2,2-dimethoxypropane
dioxane
1,3-dioxolane
1,3-dioxepane
divinyl acetylene
1,2-epoxy-3-isopropoxypropane
ethyl ether
ethylene glycol dimethyl ether
ethylvinyl ether
isoamyl benzyl ether
isophorone
isopropyl ether
beta-isopropoxypropionitrile
methyl acetylene
methly iso-butyl ketone
methyl methacrylate
methylcycolpentane
potassium metal
n-popyl isopropyl ether
propyne
sodium amide
styren
tetrahydrofuran
tetrahydronaphthalene
tetrafluoroethylene
tetralin
1,3,3-trimethoxypropane
vinyl acetate
vinyl actylene
vinyl chloride
vinyl ethers
vinyl pyridine
vinylidene chloride

PCBs

Strict time limits govern the removal and processing of materials and equipment containing or contaminated with polychlorinated biphenyls (PCBs). Before removing them contact your HWM field tech.

The WDR and supporting documents regarding characterization need to be completed before the equipment is transferred, so everything should be coordinated with your HWM field tech in advance.

Be sure to record on the WDR date when the piece of equipment was taken out of service.

PCBs greater than or equal to (≥)50 ppm and less than (<) 500 ppm must be transferred to HWM within 30 days of being taken out of service.

Waste containers with PCBs (≥) 500 ppm must be transported to HWM within 24 hours of being taken out of service. Waste not meeting the definition of a container is exempt from the 24-hour-transport rule.

When PCBs in waste are >50 ppm – DOT-approved containers are the appropriate packaging for PCB-containing waste. No lard cans are accepted. Only 5-, 30-, or 55-gallon drums can be used.

How to manage and label PCB waste

<5 ppm PCB	Not regulated by TSCA or State—don‘t send to HWM
5-50 ppm PCB	Not regulated by TSCA, but is regulated by State as Hazardous Waste
≥50 ppm PCB	Regulated by both the State and TSCA

Anti-dilution rule

The Toxic Substance Control Act (TSCA) prohibits the dilution of PCB material for the purpose of being excluded from the requirements of the regulation.

If your PCB-containing waste is generated from a spill, is mixed with another non-PCB-containing material, or if any container, item (e.g., gloves, or Kimwipes) has been in contact with PCB-containing material, you must report the PCB concentration of the newly generated waste as the concentration of the PCB from the original material.

Fluorescent ballasts containing PCB

PCB-containing ballasts fall into two categories:

- Ballasts that contain a small capacitor with PCB
- Ballasts that contain PCB oil or insulating paste.

Ballasts that contain PCB oil or paste are regulated by TSCA and must be managed as hazardous waste with PCB. These ballasts should be labeled by the manufacturer as containing PCB and need to be transferred to HWM within 30 days of being removed from service. Follow the proper labeling requirements for the item and container.

Ballasts that contain no paste but have PCB in a small capacitor will be labeled by the manufacturer and managed as hazardous waste only.

If the small PCB capacitor is broken or the seal has been broken or damaged, they must be managed as hazardous waste containing PCB according to TSCA regulations.

Please separate PCB ballasts from non-PCB-containing ballasts and separate ballasts less than 100 cu in. from those larger than 100 cu in.

Scintillation Cocktails

There are a number of different scintillation cocktails that contain components which may be hazardous. Please segregate hazardous from nonhazardous scintillation cocktails. In addition, please segregate radioactive from non-radioactive scintillation cocktails. See flow diagram on the following page.

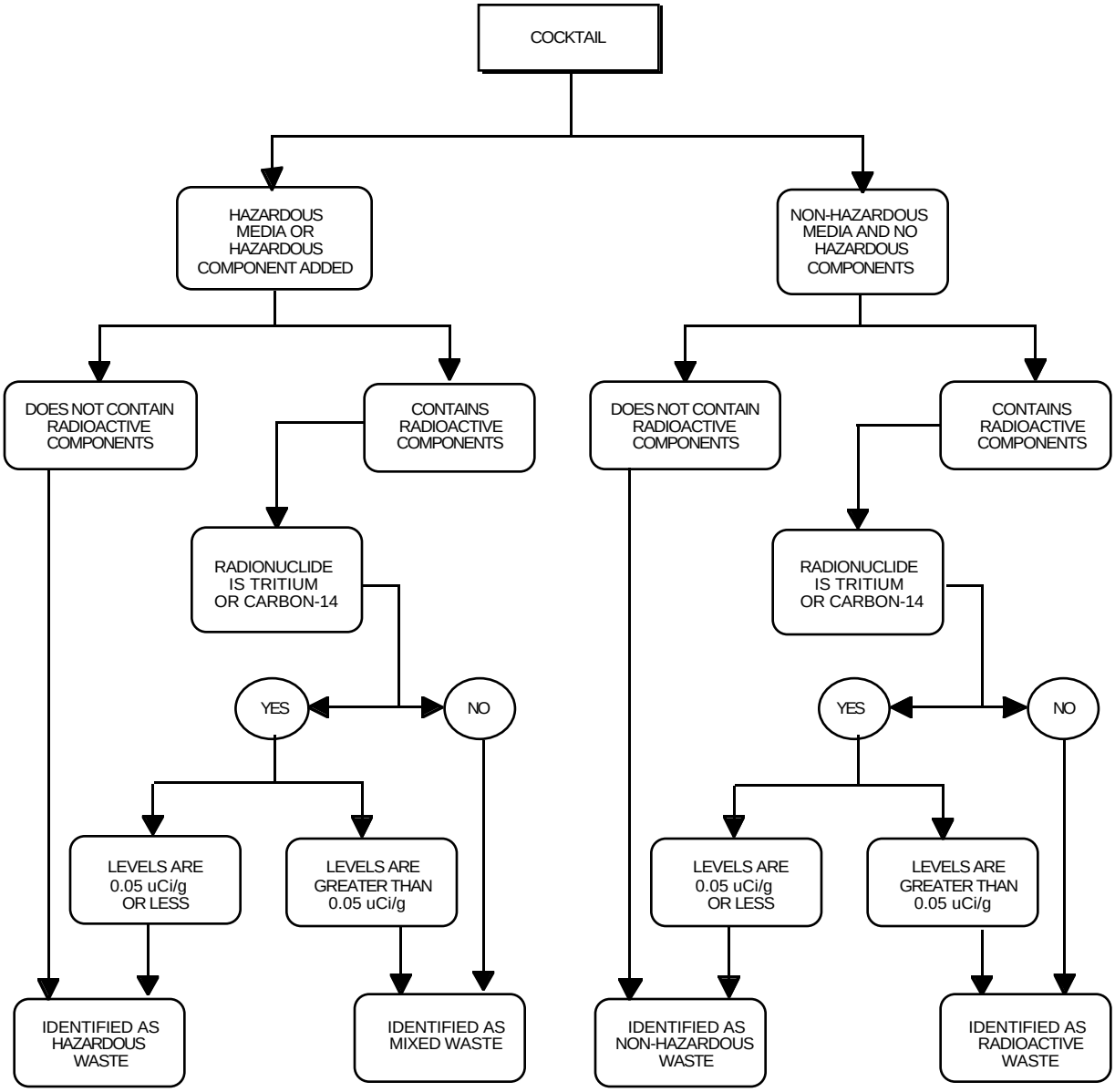
A generator may dispose of radioactive liquid scintillation cocktails as if they were not radioactive according to the 10 CFR § 20.2005 guidelines. The guidelines state that if the liquid scintillation contains 0.05 microcurie (1.85 kBq) or less of radioisotopes hydrogen-3 or carbon-14 per gram of medium used for liquid scintillation counting, the waste can be disposed of as hazardous.

Generators should keep their different types of scintillation cocktails segregated from other hazardous waste, but still indicate the isotopes and their quantities that are present in their wastes. Be sure to fill out the requisition as hazardous, not radioactive or mixed.

Any cocktail containing levels higher than those listed above of tritium or C14 must be handled as radioactive or mixed. In addition, cocktails contaminated with isotopes other than tritium or C14 are always managed as radioactive or hazardous if they are above the minimum detectable activity.

Contact your HWM field tech for assistance in bulking, sampling, and obtaining appropriate containers.

SCINTILLATION COCKTAILS AS WASTE



Sewer Waste

LLNL is served by two distinctly different sewer systems: the storm water sewer system and the sanitary sewer system. For detailed information regarding sewer waste, see **Appendix H**.

Storm water sewer system – The storm water sewer system is designed to receive storm-water runoff through grate-covered drains in streets and near buildings.

Regulations safeguarding the environment prohibit using the storm sewer drains for discharge other than rain water.

Waste from other sewers, retention tanks, or containers may not be discharged to the storm water sewers, nor to the ground.

Sanitary sewer system – LLNL's sanitary sewer system flows into the City of Livermore's sewer system. It accepts sanitary waste and industrial waste. Only tested and approved industrial waste from retention tanks and treatment systems are allowed.

At LLNL's outfall, the flow is monitored by an on-line continuous monitoring system. Samples are analyzed for radioactivity and composited monthly to determine the concentrations of specific isotopes (cesium-137 and plutonium-239) and various metals. The total sewage effluent is sampled quarterly and analyzed for a number of specific parameters.

Extreme care must be exercised at all times when evaluating a waste stream for possible discharge to the sanitary sewer system. Contact your environmental analyst for guidance. Even seemingly insignificant amounts of chemicals and metals can threaten the environment, harm people, upset the City of Livermore's treatment plant operations, and violate the Laboratory's required discharge limits, as specified in the permit from the City of Livermore and in UCAR-10235, *Guidelines for Discharge to Sanitary Sewer System*.

Shielded Items

HWM needs to know what the shielding inside waste containers is made of, i.e., lead, paraffin, polyethylene, etc. However some kinds of shielding, such as lead when used to shield a radioactive source, if combined with other waste does not cause it to be classified as mixed waste.

Unknown Waste

NOTICE

Unknown waste requires HWM field techs to follow the sequence shown below in order for HWM to accept the waste:

- Custodian of unknown waste contacts HWM field tech for assistance
- HWM field tech relays request to environmental analyst
- Environmental analyst contacts custodian to gather "generator knowledge" and to jointly develop an analysis plan — usually for x-ray fluorescence (XRF) or Fourier transmission infrared spectroscopy (FTIR)
- HWM pulls sample (using custodian's hood), and coordinates the analysis with Chemistry
- Chemistry analyzes, and sends results to Environmental Analyst
- Environmental analyst consults with custodian and requests more analysis if needed to identify chemical family for safe storage
- When identification for safe storage is complete, custodian (or Field Tech for Full Service) fills out a COC for second phase of analysis (for RCRA properties and for disposal)
- HWM field tech delivers sample to CES
- The remaining procedures and documentation of the sampling analysis and characterization is the same for "known" wastes.

Note: Analysis of unknowns is not covered by the Memos of Understanding (MOUs) for "HWM full service." Extra costs to identify the unknowns must be borne by the custodian. Facility management must take ownership of unknowns in their facilities when the original generators are gone or are themselves "unknown." HWM technician should not become "generators" or "custodians" of unknowns. Custodians are required to supply fume hoods for the safety of the HWM samplers while they are sampling of unknowns.

3.6.2 Unacceptable Waste

Categories of Unacceptable Waste

The following categories of waste cannot be accepted at HWM facilities:

- wastes that are reacting or releasing hazardous constituents at a rate that would render them unsafe to store or transport
- explosives; HWM arranges for direct shipment in certain areas
- most commercial vendor-supplied compressed gases (unless the vendor will not pick up the cylinder)
- wastes from generators who have not completed required waste management training
- improperly packaged waste or waste in damaged containers
- wastes with incomplete or improper labels or requisition forms
- wastes that cannot be identified or that are incompletely characterized
- radioactive waste that exceeds allowable activity limits per container:
  - 6 alpha curies per container of TRU*
  - 1,000 or more curies per container of tritium**
  - 120 or more grams of fissile material in a 55-gallon drum, not including uranium-235 that is part of natural or depleted uranium.

* HWM has alternative storage facilities to accommodate legacy wastes that exceed this limit. However, it is preferable that new wastes be packaged to meet the 6 alpha curie limit. Contact your HWM field tech for more information.

** 1,000 curies of tritium is the limit for transportation in standard containers. For waste containing >1,000 and <5,000 curies, contact your HWM technician.

Explosives

NOTICE

HWM cannot accept explosives in its facilities. Explosives are shipped directly to Site 300 or an off-site disposal contractor. If you suspect that you may have some explosive materials in your waste, contact your ES&H team, the Explosives safety Officer, or your HWM field tech for explosives safety guidance.

Each programmatic group where explosives are generated as waste has a guidance document entitled *Procedures for Controlling the Generation of Energetic Material Waste*. Please consult these procedures and follow the guidance therein. Be sure to fill out a requisition for your material.

Appendix A

Appendix A

Hazardous Wastes Generated at LLNL

- **Common Inorganic and Organic Wastestreams**
- **List of Chemical and Common Names for Hazardous Waste**

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Common Inorganic and Organic Wastestreams

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COMMON INORGANIC AND ORGANIC WASTESTREAMS

I/O/BOTH*	NAME/DESCRIPTION
I(O)	ACIDIC AQUEOUS SOLUTION
O	ACTIVATED CARBON-CHARCOAL
O	ANIMAL TISSUE FLUIDS
O(I)	AQU/ORG SOLUTION FROM ANALYSIS
I	AQUEOUS FROM ANALYSIS
I	ASBESTOS
O	ASPHALT EMULSION
I	BASIC/CAUSTIC AQUEOUS SOLUTION
I	BATTERIES, ALKALINE
I	BATTERIES, CADMIUM-ZINC
I	BATTERIES, DRY CELL
I	BATTERIES, LEAD ACID
I	BATTERIES, LITHIUM
I	BATTERIES, NICKEL-CADMIUM
O	CARBON BLACK
O	CARBURATOR CLEANER
O	CHARCOAL
O(I)	CLEANERS
BOTH	COMPRESSED GAS CYLINDERS
I	COOLANT WASH WATER
O(I)	DEBRIS WITH LIQUID MERCURY
I	DECON SHOWER WATER
O	DIESEL FUEL
BOTH	EMPTY CONTAINER
BOTH	EQUIPMENT WITH LIQUIDS (e.g. PCB, MERCURY, OIL)
O(I)	EQUIPMENT WITH LIQUIDS, CAPACITORS
O(I)	EQUIPMENT WITH LIQUIDS, TRANSFORMERS
I	EQUIPMENT, BIG
I	EQUIPMENT, SMALL
O	FLOOR FINISH REMOVAL SLUDGE
I	FLUORESCENT TUBES
O	FREEZE DRIED ANIMAL CARCASSES
O	FROZEN ANIMAL CARCASSES
I	HEPA FILTERS (ASBESTOS)
I	HEPA FILTERS (NON-ASBESTOS)
BOTH	HOME PRODUCTS
BOTH	INDUSTRIAL PRODUCTS
I	INORGANIC DEBRIS
BOTH	LAB CHEMICALS
O(I)	LAB DEBRIS
O(I)	LAB TRASH/DEBRIS
O	LAQUER THINNER
I	LIGHT BALLASTS
I	LIQUID MERCURY
O	MACHINING COOLANTS
I	METAL POWDERS/DUSTS
O	MIXED (INORG/ORG) DEBRIS
O	MOP WATER SLUDGE
O(I)	NON-AQUEOUS LIQUIDS,
O	OIL FILTERS
O	OIL, AIR CONDITIONER
O	OIL, BIOLOGICAL (e.g. CASTOR)
O	OIL, MOTOR
O	OIL, PETROLEUM
O	OIL, TRANSFORMER
O(I)	OIL, VACUUM PUMP
O	ORGANIC DEBRIS
O	ORGANIC LIQUIDS MIXTURE

I/O/BOTH*	NAME/DESCRIPTION
O	PAINT
O	PAINT SLUDGE
I	PAINT SPRAY BOOTH WATER
I(O)	PHOTOCHEMICAL SOLUTION
BOTH	PHOTOCHEMICALS
O	POLYMER CATALYSTS
O	POLYMER HARDERS
O	POLYMER RESINS
I	RUST/SCRAPINGS DEBRIS
O	SAFETY KLEEN
I	SAND BLASTING DUST
O	SCINTILATION COCKTAIL LIQUID
I	SCRUBBER WATER
I(O)	SEWAGE
I	SOIL
O(I)	SOLID ACIDS
I(O)	SOLID BASES
O	SOLID POLYMER/PLASTICS
O	SOLVENT MIXTURES
O	SOLVENTS
BOTH	SPILL CLEAN UP
I	STEAM PIT SLUDGE
O	TONER (BLACK POWDER)
O	TONER LIQUID CONCENTRATE
O	TRIMSOL
I	WATER JET SLUDGE
I	TANK CLEAN-OUT RINSE WATER
O	HIGH EXPLOSIVES
O	LAB TRASH CONTAMINATED WITH HIGH EXPLOSIVES
O	MOCK EXPLOSIVES
BOTH	ANALYTICAL SAMPLES
I	RAINWATER/BERM WATER
O	PPE - PERSONAL PROTECTIVE EQUIPMENT
BOTH	TANK SLUDGE REMOVAL
I(O)	PLATING SLUDGE
I	FILTER CAKE
O	DEGREASERS
O	ADHESIVES
I	EQUIPMENT, CONTAMINATED
I	DRAINED CAPACITORS
I	DRAINED TRANSFORMERS
O(I)	AEROSOLS
O	DYES/LASER DYES
O	PCB OIL
O	PCB CONTAMINATED MATERIAL
I(O)	CYANIDES CONTAINING MATERIAL
I(O)	SULFIDES CONTAINING MATERIAL
BOTH	TREATMENT SLUDGES
O(I)	GUN DEBRIS
O	DETERGENTS
I	CEMENTS
I	PLATING SOLUTIONS
I	COOLANT FROM COOLING TOWERS
O	GREASES/LUBRICANTS
O	DEBRIS WITH PESTICIDES
O	PRINTING INKS
O	OILY/SOLVENTY DEBRIS
O	CAULKING COMPOUNDS

* I: inorganic waste (<10% organics)
O: organic waste (≥ organics)
I(O): most examples of this waste are inorganic but some are organic
O(I): most examples of this waste are organic but some are inorganic with <10% organic
BOTH: inorganic and organic examples of this waste are equally common

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List of Chemical and Common Names for Hazardous Waste

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LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
30558 43 1		✔		A2213	O	U394	T	---	---
		✔		Ac 5,727	O	P202	T	X	AH,EH
75 07 0	✔	✔		Acetaldehyde	O	U001	I	I,X	---
640 19 7	✔	✔		Acetamide, 2-fluoro-	O	P057	T	---	AH
77671 22 8	✔	✔		Acetic acid	O	F027	---	I,C,X	---
141 78 6		✔		Acetic acid ethyl ester	O	U112	I	---	---
301 04 2		✔		Acetic acid, lead(2+) salt	O	U144	T	---	---
563 68 8		✔		Acetic acid, thallium(1 + salt)	O	U214	T	---	---
67 64 1	✔	✔		Acetone	O	U002	I	I	---
		✔		Acetone (spent solvent)	O	F003	---	---	---
75 86 5	✔	✔		Acetone cyanohydrin	O	P069	T	X	AH
75 05 8	✔	✔		Acetonitrile	O	U003	I,T	I,X	---
98 86 2		✔		Acetophenone	O	U004	T	---	---
123 86 4	✔		1-	Acetoxybutane	O	---	---	X	---
628 63 7	✔		1-	Acetoxypentane	O	---	---	I,X	---
644 31 5	✔			Acetyl benzoyl peroxide	O	---	---	I,R,X	---
75 36 5	✔	✔		Acetyl chloride	O	U006	C,R,T	C,R,X	EH
110 22 5	✔			Acetyl peroxide	O	---	---	I,R,X	---
591 08 2		✔	1-	Acetyl-2-thiourea	O	P002	T	---	AH
53 96 3	✔	✔	2-		O	U005	T	X	EH
	✔			Acetylene sludge	O	---	---	C	---
	✔			Acid and water	I	---	---	C	---
	✔			Acid sludge	I/O	---	---	C	---
260 94 6	✔			Acridine	O	---	---	X	---
107 02 8	✔	✔		Acrolein	O	P003	T	I,X	AH,EH
79 06 1		✔		Acrylamide	O	U007	T	---	---
79 10 7		✔		Acrylic acid	O	U008	I	---	---
107 13 1	✔	✔		Acrylonitrile	O	U009	T	I,X	EH
66 81 9	✔			Actidione	O	---	---	X	EH
111 69 3	✔			Adiponitrile	O	---	---	X	EH
	✔		4-	ADP	O	---	---	X	EH
330 68 7	✔	✔		AFL 1082	O	P057	T	X	AH,EH
	✔			AFU Floc	O	---	---	X	---
123 88 6	✔			Agallol	O	---	---	X	EH
116 06 3	✔	✔		Aldicarb	O	P070	T	X	AH, EH
1646 88 4		✔		Aldicarb sulfone	O	P203	T	---	AH
309 00 2	✔	✔		Aldrin	O	P004	T	X	AH,EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
	✔			Alkaline caustic liquids	I	---	---	C	---
	✔			Alkaline cleaner	I	---	---	C	---
	✔			Alkaline corrosive battery fluid	I	---	---	C	---
	✔			Alkaline corrosive liquids	I	---	---	C	---
	✔			Alkyl aluminum chloride	O	---	---	I,C,R	EH
	✔			Alkyl aluminum compounds	O	---	---	I,C,R	EH
107 18 6	✔	✔		Allyl alcohol	O	P005	T	I,X	AH
106 95 6	✔			Allyl bromide	O	---	---	I,X	---
07 05 1	✔			Allyl chloride	O	---	---	I,X	---
2937 50 0	✔			Allyl chlorocarbonate	O	---	---	I,X	---
2937 50 0	✔			Allyl chloroformate	O	---	---	I,X	---
107 37 9	✔			Allyl trichlorosilane	O	---	---	I,C,R,X	EH
7429 90 5	✔			Aluminum (powder)	I	---	---	I	---
7446 70 0	✔			Aluminum chloride	I	---	---	C,X	---
	✔			Aluminum chloride (anhydrous)	I	---	---	C,R,X	EH
	✔			Aluminum diethyl monochloride	O	---	---	I,R	EH
7784 18 1	✔			Aluminum fluoride	I	---	---	C,X	---
13473 90 0	✔			Aluminum nitrate	I	---	---	I,X	---
20859 73 8	✔	✔		Aluminum phosphide	I	P006	R,T	I,R,X	AH,EH
	✔		4-	Amidino-1-(nitrosamino-amidino)-	O	---	---	I,R	---
95 69 2	✔		2-	Amino-4-chlorotoluene	O	---	---	X	---
62 53 3	✔	✔		Aminobenzene	O	U012	I,T	X	---
109 73 9	✔		1-	Aminobutane	O	---	---	X	---
92 67 1	✔		4-	Aminodiphenyl	O	---	---	X	EH
75 04 7	✔			Aminoethane	O	---	---	I,X	---
74 89 5	✔			Aminomethane	O	---	---	I,X	---
2763 96 4		✔	5-	Aminomethyl-3-isoxazolol	O	P007	T	---	AH
110 58 7	✔		1-	Aminopentane	O	---	---	I,X	---
75 31 0	✔		2-	Aminopropane	O	---	---	I,X	---
105650 23 5	✔		2-	Aminopyridine	O	---	---	X	EH
504 24 5		✔	4-	Aminopyridine	O	P008	T	---	AH
591 08 2		✔	n-	Aminothioxomethyl-acetamide	O	P002	T	---	AH
106 49 0	✔		m-	Aminotoluene	O	---	---	X	---
61 82 5		✔		Amitrole	O	U011	T	---	---
127795 79 3	✔			Ammonium arsenate	I	---	---	X	EH
7789 09 5	✔			Ammonium bichromate	I	---	---	I,C,X	---
1341 49 7	✔			Ammonium bifluoride	I	---	---	C,X	EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

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Acutely Hazardous	AH	
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California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
52110 72 2	✔			Ammonium chromate	I	---	---	I,X	---
7789 09 5	✔			Ammonium dichromate	I	---	---	I,C,X	---
12125 01 8	✔			Ammonium fluoride	I	---	---	C,X	---
1694 09 3	✔			Ammonium hydroxide	I	---	---	C,X	---
11098 84 3	✔			Ammonium molybdate	I	---	---	X	---
6484 52 2	✔			Ammonium nitrate	I	---	---	I,R	---
7790 98 9	✔			Ammonium perchlorate	I	---	---	I,R	---
13446 10 1	✔			Ammonium permanganate	I	---	---	I,R,X	---
7727 54 0	✔			Ammonium persulfate	I	---	---	I,R	---
131 74 8	✔	✔		Ammonium picrate	O	P009	R	I,R	AH
12135 76 1	✔			Ammonium sulfide	I	---	---	I,C,R,X	---
7803 55 6		✔		Ammonium vanadate	I	P119	T	---	AH
	✔			Amorphous red phosphorus	I	---	---	I,R,X	---
628 63 7	✔		n-	Amyl acetate	O	---	---	I,X	---
543 59 9	✔		n-	Amyl chloride	O	---	---	I,X	---
110 66 7	✔		n-	Amyl mercaptan	O	---	---	I,X	---
463 04 7	✔		n-	Amyl nitrite	O	---	---	I,X	---
107 72 2	✔			Amyl trichlorosilane	O	---	---	C,R,X	EH
110 58 7	✔		n-	Amylamine	O	---	---	I,X	---
8029 08 2	✔		n-	Amylene	O	---	---	I,X	---
62 53 3	✔	✔		Aniline	O	U012	I,T	X	---
2227 13 6	✔			Animert V-101	O	---	---	X	EH
1300 64 7	✔			Anisoyl chloride	O	---	---	C,X	---
120 12 7	✔			Anthracene	O	---	---	X	---
7440 36 0	✔			Antimony	I	---	---	X	---
	✔			Antimony chloride	I	---	---	C,X	---
	✔			Antimony compounds	I	---	---	X	---
127386 54 3	✔			Antimony fluoride	I	---	---	C,X	---
1309 64 4	✔			Antimony oxide	I	---	---	X	---
7647 18 9	✔			Antimony pentachloride	I	---	---	C,R,X	---
7783 70 2	✔			Antimony pentafluoride	I	---	---	C,R,X	EH
129680 26 8	✔			Antimony pentasulfide	I	---	---	I,X	EH
28300 74 5	✔			Antimony potassium tartrate	I	---	---	X	---
	✔			Antimony sulfate	I	---	---	I,X	---
12627 52 0	✔			Antimony sulfide	I	---	---	I,R,X	---
10025 91 9	✔			Antimony trichloride	I	---	---	C,X	---
7783 56 4	✔			Antimony trifluoride	I	---	---	C,X	---

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Reactive Waste	R	R
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Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
1309 64 4	✔			Antimony trioxide	I	---	---	X	---
7446 32 4	✔			Antimony trisulfate	I	---	---	I,X	---
1345 04 6	✔			Antimony trisulfide	I	---	---	I,R,X	---
8007 56 5	✔			Aqua regia	I	---	---	I,C,X	---
107 02 8	✔	✔		Aqualin	O	P003	T	I,X	AH,EH
123 88 6	✔			Aretan	O	---	---	X	EH
506 61 6		✔		Argentate(1-), bis(cyano-C)-, potassium	I	P099	T	---	AH
7440 38 2	✔			Arsenic	I	---	---	X	EH
7778 39 4	✔	✔		Arsenic acid and salts	I	P010	T	X	AH,EH
64973 06 4	✔			Arsenic bromide	I	---	---	X	EH
37226 49 6	✔			Arsenic chloride	I	---	---	X	EH
	✔			Arsenic compounds	I	---	---	X	EH
23302 47 8	✔			Arsenic disulfide	I	---	---	X	EH
35171 52 9	✔			Arsenic iodide	I	---	---	X	EH
1327 53 3	✔	✔		Arsenic oxide	I	P012	T	X	AH
	✔			Arsenic pentaselenide	I	---	---	X	EH
1303 28 2	✔	✔		Arsenic pentoxide	I	P011	T	X	AH,EH
12612 21 4	✔			Arsenic sulfide	I	---	---	X	EH
82868 10 8	✔			Arsenic tribromide	I	---	---	X	EH
60646 36 8	✔			Arsenic trichloride	I	---	---	X	EH
50288 23 8	✔			Arsenic triiodide	I	---	---	X	EH
	✔			Arsenious acid and salts	I	---	---	X	EH
692 42 2		✔		Arsine, diethyl-	O	P038	T	---	AH
	✔			Arsines	I	---	---	X	EH
75 60 5		✔		Arsinic acid, dimethyl-	O	U136	T	---	---
696 28 6		✔		Arsonous dichloride, phenyl-	O	P036	T	---	AH
1332 21 4	✔			Asbestos	I	---	---	X	---
	✔			Asbestos waste	I	---	---	X	---
68131 74 8	✔			Ashes	I/O	---	---	C,X	---
492 80 8		✔		Auramine	O	U014	T	---	---
115 02 6		✔		Azaserine	O	U015	T	---	---
151 56 4		✔		Aziridine	O	P054	T	I,R,X	AH, EH
75 55 8		✔		Aziridine, 2- methyl-	O	P067	T	---	AH
50 07 7		✔		Azirino[2',3',3,4]pyrrol[1,2-a]oindole-4,7-dione,6-amino-8-[[(aminocarbonyl)oxy]...	O	U010	T	---	---
6923 22 4	✔			Azodrin	O	---	---	X	EH
	✔			Bag house wastes	O	---	---	X	---
671 04 5	✔			Banol	I	---	---	X	EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
101 27 9		✔		Barban	O	U280	T	---	---
5160 02 1	✔			Barium	I	---	---	I,X	---
18810 58 7	✔			Barium azide	I	---	---	I,R	---
10553 31 8	✔			Barium bromide	I	---	---	X	---
513 77 9	✔			Barium carbonate	I	---	---	X	---
13477 00 4	✔			Barium chlorate	I	---	---	I,C,R,X	---
10361 37 2	✔			Barium chloride	I	---	---	X	---
10294 40 3	✔			Barium chromate	I	---	---	X	---
512 25 4	✔			Barium citrate	O	---	---	X	---
	✔			Barium compounds (soluble)	I	---	---	X	---
542 62 1	✔	✔		Barium cyanide	I	P013	T	X	AH,EH
75013 56 8	✔			Barium fluoride	I	---	---	X	---
17125 80 3	✔			Barium fluosilicate	I	---	---	X	---
17194 00 2	✔			Barium hydroxide	I	---	---	X	---
13718 50 8	✔			Barium iodide	I	---	---	X	---
12737 09 6	✔			Barium manganate	I	---	---	X	---
1304 28 5	✔			Barium monoxide	I	---	---	X	---
10022 31 8	✔			Barium nitrate	I	---	---	I,X	---
1304 28 5	✔			Barium oxide	I	---	---	X	---
13465 95 7	✔			Barium perchlorate	I	---	---	I,R,X	---
7787 36 2	✔			Barium permanganate	I	---	---	I,R,X	---
1304 29 6	✔			Barium peroxide	I	---	---	I,R,X	---
13847 18 2	✔			Barium phosphate	I	---	---	X	---
6865 35 6	✔			Barium stearate	O	---	---	X	---
21109 95 5	✔			Barium sulfide	O	---	---	X	---
7787 39 5	✔			Barium sulfite	O	---	---	X	---
	✔			Battery acid	I	---	---	C,X	---
	✔			Bayer 25141	O	---	---	X	EH
	✔			Bayer 25634	O	---	---	X	EH
542 88 1	✔			BCME	O	---	---	X	EH
22781 23 3		✔		Bendiocarb	O	U278	T	---	---
22781 23 3		✔		Bendiocarb phenol	O	U364	T	---	---
17804 35 2		✔		Benomyl	O	U271	T	---	---
56 55 3		✔		Benz[a]anthracene	O	U018	T	---	---
57 97 6		✔		Benz[a]anthracene, 7,12-dimethyl-	O	U094	T	---	---
225 51 4		✔		Benz[c]acridine	O	U016	T	---	---
56 49 5		✔		Benz[j]aceanthrylene, 1,2-dihydro-3-methyl-	O	U157	T	---	---

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98 87 3		✔		Benzal chloride	O	U017	T	---	---
23950 58 5		✔		Benzamide	O	U192	T	---	---
62 53 3		✔		Benzenamine	O	U012	I,T	---	---
95 53 4		✔		Benzenamine, 2-methyl-	O	U328	T	---	---
636 21 5		✔		Benzenamine, 2-methyl-, hydrochloride	O	U222	T	---	---
99 55 8		✔		Benzenamine, 2-methyl-5-nitro-	O	U181	T	---	---
492 80 8		✔		Benzenamine, 4,4'-carbonimidoylbis[N,N-dimethyl-	O	U014	T	---	---
101 14 4		✔		Benzenamine, 4,4'-methylenebis[2-chloro-	O	U158	T	---	---
106 47 8		✔		Benzenamine, 4-chloro-	O	P024	T	---	AH
3165 93 3		✔		Benzenamine, 4-chloro-2-methyl-, hydrochloride	O	U049	T	---	---
106 49 0		✔		Benzenamine, 4-methyl-	O	U353	T	---	---
100 01 6		✔		Benzenamine, 4-nitro-	O	P077	T	---	AH
60 11 7		✔		Benzenamine, N,N-dimethyl-4-(phenylazo)-	O	U093	T	---	---
71 43 2	✔	✔		Benzene	O	U019	I,T	I,X	---
58 89 9	✔			Benzene hexachloride	O	---	---	X	EH
98 82 8		✔		Benzene, (1-methylethyl)-	O	U055	I	---	---
100 44 7		✔		Benzene, (chloromethyl)-	O	P028	T	---	AH
98 87 3		✔		Benzene, (dichloromethyl)-	O	U017	T	---	---
98 07 7		✔		Benzene, (trichloromethyl)-	O	U023	T	---	---
72 43 5		✔		Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4- methoxy-	O	U247	T	---	---
50 29 3		✔		Benzene, 1,1'-(2,2,2-trichloroethylidene)bis[4-chloro-	O	U061	T	---	---
72 54 8		✔		Benzene, 1,1'-(2,2-dichloroethylidene)bis[4-chloro-	O	U060	T	---	---
95 94 3		✔		Benzene, 1,2,4,5-tetrachloro-	O	U207	T	---	---
95 50 1		✔		Benzene, 1,2-dichloro-	O	U070	T	---	---
99 35 4		✔		Benzene, 1,3,5-trinitro-	O	U234	T	---	---
541 73 1		✔		Benzene, 1,3-dichloro-	O	U071	T	---	---
26471 62 5		✔		Benzene, 1,3-diisocyanatomethyl-	O	U223	R,T	---	---
106 46 7		✔		Benzene, 1,4-dichloro-	O	U072	T	---	---
101 55 3		✔		Benzene, 1-bromo-4-phenoxy-	O	U030	T	---	---
121 14 2		✔		Benzene, 1-methyl-2,4-dinitro-	O	U105	T	---	---
606 20 2		✔		Benzene, 2-methyl-1,3-dinitro-	O	U106	T	---	---
108 90 7		✔		Benzene, chloro-	O	U037	T	---	---
1330 20 7		✔		Benzene, dimethyl-	O	U239	I,T	---	---
118 74 1		✔		Benzene, hexachloro-	O	U127	T	---	---
110 82 7		✔		Benzene, hexahydro-	O	U056	I	---	---
108 88 3		✔		Benzene, methyl-	O	U220	T	---	---
98 95 3		✔		Benzene, nitro-	O	U169	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
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Reactive Waste	R	R
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Acutely Hazardous	AH	
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Chemical Abstract Service, American Chemical Society, 1996

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608 93 5		✔		Benzene, pentachloro-	O	U183	T	---	---
82 68 8		✔		Benzene, pentachloronitro-	O	U185	T	---	---
510 15 6		✔		Benzeneacetic acid, 4-chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-, ethyl ester	O	U038	T	---	---
305 03 3		✔		Benzenebutanoic acid, 4-[bis(2-chloroethyl)amino]-	O	U035	T	---	---
25376 45 8		✔	1,3-	Benzenediamine, 2-methyl	O	U221	T	---	---
496 72 0		✔	1,2-	Benzenediamine, 4-methyl	O	U221	T	---	---
117 84 0		✔	1,2-	Benzenedicarboxylic acid	O	U107	T	---	---
117 81 7		✔	1,2-	Benzenedicarboxylic acid, bis(2-ethylhexyl) ester	O	U028	T	---	---
84 74 2		✔	1,2-	Benzenedicarboxylic acid, dibutyl ester	O	U069	T	---	---
84 66 2		✔	1,2-	Benzenedicarboxylic acid, diethyl ester	O	U088	T	---	---
131 11 3		✔	1,2-	Benzenedicarboxylic acid, dimethyl ester	O	U102	T	---	---
117 84 0		✔	1,2-	Benzenedicarboxylic acid, dioctyl ester	O	U107	T	---	---
108 46 3		✔	1,3-	Benzenediol	O	U201	T	---	---
51 43 4		✔	1,2-	Benzenediol, 4-[1-hydroxy-2-(methylamino)ethyl]-	O	P042	R	---	AH
122 09 8		✔		Benzeneethanamine, alpha,alpha-dimethyl-	O	P046	T	---	AH
	✔			Benzenephosphorous dichloride	O	---	---	I,R	EH
5160 02 1	✔			Benzenesulfonic acid	O	---	---	X	---
98 09 9		✔		Benzenesulfonic acid chloride	O	U020	C,R	---	---
98 09 9		✔		Benzenesulfonyl chloride	O	U020	C,R	---	---
108 98 5		✔		Benzenethiol	O	P014	T	---	AH
92 87 5		✔		Benzidine	O	U021	T	---	---
	✔	✔		Benzidine and salts	O	U021	T	X	EH
		✔	1H-	Benzimidazol-2-yl, methyl ester	O	U372	T	---	---
81 07 2		✔	1,2-	Benzisothiazol-3(2H)-one, 1,1-dioxide, and salts	O	U202	T	---	---
50 32 8		✔		Benzo[a]pyrene	O	U022	T	---	---
189 55 9		✔		Benzo[rst]pentaphene	O	U064	T	---	---
120 58 1		✔	1,3-	Benzodioxole, 5-(1-propenyl)-	O	U141	T	---	---
94 59 7		✔	1,3-	Benzodioxole, 5-(2-propenyl)-	O	U203	T	---	---
94 58 6		✔	1,3-	Benzodioxole, 5-propyl-	O	U090	T	---	---
22961 82 6		✔	1,3-	Benzodioxole-4-ol, 2,2-dimethyl	O	U364	T	---	---
22781 23 3		✔	1,3-	Benzodioxole-4-ol, 2,2-dimethyl-, methyl carbamate	O	U278	T	---	---
1563 38 8		✔	7-	Benzofuranol, 2,3-dihydro-2,2-dimethyl-	O	U367	T	---	---
55285 14 8		✔		Benzoic acid, 2-hydroxy-, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]...	O	P188	T	---	---
		✔	2H-1-	Benzopyran-2-one, 4-hydroxy-3-(3-oxo-1-phenylbutyl)-, & salts < 0.3%	O	P001	T	---	---
106 51 4	✔		1,4-	Benzoquinone	O	---	---	X	EH
106 51 4		✔	p-	Benzoquinone	O	U197	T	---	---
98 07 7		✔		Benzotrichloride	O	U023	C,R,T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

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California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
98 08 8	✔			Benzotrifluoride	O	---	---	I,X	EH
98 88 4	✔			Benzoyl chloride	O	---	---	C,R,X	EH
94 36 0	✔			Benzoyl peroxide	O	---	---	I,R,X	---
100 39 0	✔			Benzyl bromide	O	---	---	C,X	---
100 44 7	✔	✔		Benzyl chloride	O	P028	T	X	AH
501 53 1	✔			Benzyl chlorocarbonate	O	---	---	C,R,X	EH
501 53 1	✔			Benzyl chloroformate	O	---	---	C,R,X	EH
7440 41 7	✔	✔		Beryllium	I	P015	T	I,X	AH,EH
7787 47 5	✔			Beryllium chloride	I	---	---	X	EH
	✔			Beryllium compounds	I	---	---	X	EH
	✔			Beryllium copper	I	---	---	X	EH
7787 49 7	✔			Beryllium fluoride	I	---	---	X	EH
7787 52 2	✔			Beryllium hydride	I	---	---	I,C,R,X	EH
13327 32 7	✔			Beryllium hydroxide	I	---	---	X	EH
1304 56 9	✔			Beryllium oxide	I	---	---	X	EH
7440 41 7		✔		Beryllium powder	I	P015	T	---	AH
	✔			Beryllium waste	I	---	---	X	---
141 66 2	✔			Bidrin	O	---	---	X	EH
	✔			Bilge water	I/O	---	---	X	---
98 07 7		✔	2,2'-	Bioxirane	O	U023	T	---	---
1336 36 3	✔			Biphenyl	O	---	---	X	EH
1464 53 5		✔	[1,1'-	Biphenyl]-4,4'-diamine	O	U085	T	---	---
92 87 5		✔	[1,1'-	Biphenyl]-4,4'-diamine, 3,3'-dichloro-	O	U021	T	---	---
91 94 1		✔	[1,1'-	Biphenyl]-4,4'-diamine, 3,3'-dimethoxy-	O	U073	T	---	---
119 90 4		✔	[1,1'-	Biphenyl]-4,4'-diamine, 3,3'-dimethyl-	O	U091	T	---	---
7440 69 9	✔			Bismuth	I	---	---	I,X	---
	✔			Bismuth chromate	I	---	---	X	---
7758 98 7	✔			Blue vitriol	I	---	---	X	---
	✔			Boiler cleaning waste	I	---	---	C,X	---
122 10 1	✔			Bomyl	O	---	---	X	EH
	✔			Boranes	I	---	---	I,R,X	EH
	✔			Bordeaux arsenites	O	---	---	X	EH
10294 34 5	✔			Boron trichloride	I	---	---	C,R,X	EH
	✔			Boron trifluroide	I	---	---	C,R,X	EH
57 57 8	✔			BPL	O	---	---	X	EH
7758 01 2	✔			Bromic acid	I	---	---	X	---
7726 95 6	✔			Bromine	I	---	---	I,C,X	EH

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506 68 3	✔	✔		Bromine cyanide	I	U246	T	X	---
7789 30 2	✔			Bromine pentafluoride	I	---	---	I,C,R,X	EH
7787 71 5	✔			Bromine trifluoride	I	---	---	I,C,R,X	EH
106 96 7	✔		3-	Bromo-1-propyne	O	---	---	I,X	EH
598 31 2		✔	1-	Bromo-2-propanone	O	P017	T	---	AH
101 55 3		✔	1-	Bromo-4-phenoxy-benzene	O	U030	T	---	---
598 31 2		✔		Bromoacetone	O	P017	T	---	AH
119 93 7		✔		Bromoform	O	U095	T	---	---
74 83 9	✔	✔		Bromomethane	O	U029	T	X	EH
75 25 2		✔	4-	Bromophenyl phenyl ether	O	U225	T	---	---
106 95 6	✔		3-	Bromopropene	O	---	---	I,X	---
100 39 0	✔		a-	Bromotoluene	O	---	---	C,X	---
357 57 3	✔	✔		Brucine	O	P018	T	X	AH,EH
	✔			Bunker oil	O	---	---	I,X	---
101 55 3		✔	1,3-	Butadiene, 1,1,2,3,4,4-hexachloro-	O	U030	T	---	---
123 72 8	✔		n-	Butanal	O	---	---	I,X	---
87 68 3		✔	1-	Butanamine, N-butyl-N-nitroso-	O	U128	T	---	---
109 79 5	✔		1-	Butanethiol	O	---	---	I,X	---
6659 60 5	✔		1,2,4-	Butanetriol trinitrate	O	---	---	R	---
71 36 3	✔	✔	1-	Butanol	O	U031	I	X	---
78 93 3	✔	✔	2-	Butanone	O	U159	I,T	I,X	---
39196 18 4		✔	2-	Butanone, 3,3-dimethyl-1-(methylthio)etc...	O	P045	T	---	---
1338 23 4		✔	2-	Butanone, peroxide	O	U159	R,T	---	---
4170 30 3	✔	✔	2-	Butenal	O	U053	T	X	EH
764 41 0		✔	2-	Butene, 1,4-dichloro-	O	U074	I,T	---	---
	✡✡✡✡	✡✡✡✡	3-	Butene-2-one	O	---	---	I,X	---
303 34 4		✔	2-	Butenoic acid, 2-methyl-, 7-[[2,3-etc.....	O	U143	T	---	---
123 86 4	✔		n-	Butyl acetate	O	---	---	X	---
71 36 3	✔	✔	n-	Butyl alcohol	O	U031	I	X	---
		✔	n-	Butyl alcohol, spent solvent	O	F003	---	---	---
924 16 3	✔		n-	Butyl amine	O	---	---	X	---
142 96 1	✔			Butyl ether	O	---	---	I,X	---
	✔		n-	Butyl formate (and isomers)	O	---	---	X	---
	✔		tert-	Butyl hydroperoxide (and isomers)	O	---	---	I,X	---
109 79 5	✔		n-	Butyl mercaptan	O	---	---	I,X	---
107 71 1	✔		tert-	Butyl peroxyacetate	O	---	---	I,R	---
614 45 9	✔		tert-	Butyl peroxybenzoate	O	---	---	I,R	---

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927 07 1	✔		tert-	Butyl peroxypivalate	O	---	---	I,R	---
98 51 1	✔		p-tert-	Butyl toluene	O	---	---	X	---
87 68 3		✔	n-	Butyl-n-nitroso-1-butanamine	O	U128	T	---	---
123 72 8	✔		n-	Butylaldehyde	O	---	---	I,X	---
		✔	1-	Butylamino carbonyl-1H-benzimidazol-2-yl-, methyl ester	O	U271	T	---	---
2008 41 5		✔		Butylate	O	U389	T	---	---
	✔		n-	Butyllithium (and isomers)	O	---	---	I,C,R,X	EH
	✔		n-	Butyltrichlorosilane	O	---	---	I,C,R	EH
123 72 8	✔		n-	Butyraldehyde	O	---	---	I,X	---
75 60 5	✔	✔		Cacodylic acid	O	U136	T	X	EH
	✔			Cadmium (powder)	I	---	---	I,X	EH
10108 64 2	✔			Cadmium chloride	I	---	---	X	---
	✔			Cadmium compounds	I	---	---	X	EH
542 83 6	✔			Cadmium cyanide	I	---	---	X	EH
7790 79 6	✔			Cadmium fluoride	I	---	---	X	---
10325 94 7	✔			Cadmium nitrate	I	---	---	I,R,X	---
1306 19 0	✔			Cadmium oxide	I	---	---	X	---
13847 17 1	✔			Cadmium phosphate	I	---	---	X	---
10124 36 4	✔			Cadmium sulfate	I	---	---	X	---
7440 70 2	✔			Calcium	I	---	---	I,R	EH
7778 44 1	✔			Calcium arsenate	I	---	---	X	EH
	✔			Calcium arsenite	I	---	---	X	EH
75 20 7	✔			Calcium carbide	I	---	---	I,C,R	EH
10137 74 3	✔			Calcium chlorate	I	---	---	I,R	---
14674 72 7	✔			Calcium chlorite	I	---	---	I	---
13765 19 0		✔		Calcium chromate	I	U032	T	---	---
57 12 5		✔		Calcium cyanide	I	P021	T	---	AH
1305 79 9	✔			Calcium dioxide	I	---	---	I,C	---
7789 75 5	✔			Calcium fluoride	I	---	---	X	---
7789 78 8	✔			Calcium hydride	I	---	---	I,C,R	EH
1305 62 0	✔			Calcium hydroxide	I	---	---	C	---
7778 54 3	✔			Calcium hypochlorite	I	---	---	I,C,R,X	EH
37367 98 9	✔			Calcium molybdate	I	---	---	X	---
10124 37 5	✔			Calcium nitrate	I	---	---	I,R	---
1305 78 8	✔			Calcium oxide	I	---	---	C	---
	✔			Calcium oxychloride (dry)	I	---	---	I,C,R,X	EH
10118 76 0	✔			Calcium permanganate	I	---	---	I,X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
1305 79 9	✔			Calcium peroxide	I	---	---	I,C	---
1305 99 3	✔			Calcium phosphide	I	---	---	I,R,X	EH
9007 13 0	✔			Calcium resinate	I	---	---	I	---
	✔		1-	Caprylene	O	---	---	I,X	---
762 16 3	✔			Caprylyl peroxide	O	---	---	I	---
463 77 4		✔		Carbamic acid	O	P189	T	---	AH
615 53 2		✔		Carbamic acid, methylnitroso-, ethyl ester	O	U178	T	---	---
79 44 7		✔		Carbamic chloride, dimethyl-	I/O	U097	T	---	---
111 54 6		✔		Carbamodithioic acid, 1,2-ethanediylbis-, salts and esters	O	U114	T	---	---
2303 16 4		✔		Carbamothioic acid, bis(1-methylethyl)-, S-etc.	O	U062	T	---	---
671 04 5	✔			Carbanolate	I	---	---	X	EH
63 25 2		✔		Carbaryl	O	U279	T	---	---
10605 21 7		✔		Carbendazim	O	U372	T	---	---
1563 66 2		✔		Carbofuran	O	P127	T	---	AH
1563 38 8		✔		Carbofuran phenol	O	U367	T	---	---
108 95 2	✔			Carbolic acid	O	---	---	C,X	---
7786 34 7	✔		2-	Carbomethoxy-1-methylvinyl dimethylphosphate	O	---	---	X	EH
75 15 0	✔	✔		Carbon bisulfide	I	P022	T	I,X	AH
75 15 0	✔	✔		Carbon disulfide	I	P022	T	I,X	AH
		✔		Carbon disulfide, spent solvent	I	F005	---	---	---
353 50 4		✔		Carbon oxyfluoride	I	U033	R,T	---	---
56 23 5	✔	✔		Carbon tetrachloride	O	U211	T	X	---
		✔		Carbon tetrachloride, degreasing solvent	O	F001	---	---	---
6533 73 9		✔		Carbonic acid, dithallium (1 +) salt	O	U215	T	---	---
75 44 5		✔		Carbonic dichloride	O	P095	T	---	AH
353 50 4		✔		Carbonic difluoride	O	U033	T	---	---
492 80 8		✔	4,4-	Carbonimidoylbis[N,N-dimethyl)-benzenamine	O	U014	T	---	---
79 22 1		✔		Carbonochloridic acid, methyl ester	O	U156	I,T	---	---
75 44 5	✔	✔		Carbonyl chloride	I	P095	T	I,R	AH,EH
786 19 6	✔			Carbophenothion	O	---	---	X	EH
55285 14 8		✔		Carbosulfan	O	P189	T	---	AH
535 89 7	✔			Castrix	O	---	---	X	EH
	✔			Catalyst	O	---	---	I,C,X	---
1310 58 3	✔			Caustic potash	I	---	---	C,X	---
69012 40 4	✔			Caustic sludge	I	---	---	C	---
8012 01 9	✔			Caustic soda	I	---	---	C,X	---
	✔			Caustic wastewater	I	---	---	C	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
9004 70 0	✔			Cellulose nitrate	O	---	---	I,R	---
	✔	✔		Chemflorm	O	U247	T	X	EH
75 87 6		✔		Chloral	O	U034	T	---	---
302 17 0	✔			Chloral hydrate	O	---	---	X	---
305 03 3		✔		Chlorambucil	O	U035	T	---	---
57 74 9	✔	✔		Chlordane, alpha and gamma isomers	O	U036	T	X	EH
	✔	✔		Chlorecone	O	U142	T	X	EH
470 90 6	✔			Chlorfenvinphos	O	---	---	X	EH
7782 50 5	✔			Chlorine	I	---	---	I,C,R,X	EH
10049 04 4	✔			Chlorine dioxide	I	---	---	I,C,R,X	EH
13637 63 3	✔			Chlorine pentafluoride	I	---	---	I,C,R,X	EH
7790 91 2	✔			Chlorine trifluoride	I	---	---	I,C,R,X	EH
494 03 1		✔		Chlornaphazin	O	U026	T	---	---
88 88 0	✔		2-	Chloro-1,3,5-trinitrobenzene	O	---	---	I,R	---
108 60 1		✔	bis(2-	Chloro-1-methylethyl) ether	O	U027	T	---	---
97 00 7	✔		1-	Chloro-2,4-dinitrobenzene	O	---	---	I,R	---
3165 93 3		✔	4-	Chloro-2-methyl-benzenamine hydrochloride	O	U049	T	---	---
78 95 5	✔		1-	Chloro-2-propanone	O	---	---	X	---
59 50 7		✔	4-	Chloro-3-methyl-phenol	O	U039	T	---	---
510 15 6		✔	4-	Chloro-alpha-(4-chlorophenyl)-alpha-hydroxy-benzeneacetic acid, ethyl ester	O	U038	T	---	---
59 50 7		✔	p-	Chloro-m-cresol	O	U039	T	---	---
	✔			Chloro-o-toluidine	O	---	---	X	---
3165 93 3		✔	4-	Chloro-o-toluidine, hydrochloride	O	U049	T	---	---
107 20 0	✔	✔		Chloroacetaldehyde	O	P023	T	C,X	AH,EH
79 11 8	✔			Chloroacetic acid	O	---	---	C,X	---
78 95 5	✔			Chloroacetone	O	---	---	X	---
532 27 4	✔		a-	Chloroacetophenone	O	---	---	X	EH
106 47 8		✔	p-	Chloroaniline	O	P024	T	---	AH
106 47 8		✔	4-	Chlorobenzenamine	O	P024	T	---	AH
108 90 7	✔	✔		Chlorobenzene	O	U037	T	I,X	---
		✔		Chlorobenzene, spent solvent	O	F002	---	---	---
510 15 6		✔		Chlorobenzilate	O	U038	T	---	---
94 17 7	✔		p-	Chlorobenzoyl peroxide	O	---	---	I,R	---
	✔		o-	Chlorobenzylidene malonitrile	O	---	---	X	EH
121 73 3	✔			Chlorochromic anhydride	I	---	---	I,C,R,X	EH
75 00 3	✔			Chloroethane	O	---	---	I,X	---
75 01 4		✔		Chloroethene	O	U043	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
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CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
111 91 1		✔	bis-2-	Chloroethoxy methane	O	U024	T	---	---
110 75 8		✔	2-	Chloroethoxyethene	O	U042	T	---	---
305 03 3		✔	4-(bis) 2-	Chloroethyl amino-benzenebutanoic acid	O	U035	T	---	---
111 44 4		✔	bis-2-	Chloroethyl ether	O	U025	T	---	---
110 75 8		✔	2-	Chloroethyl vinyl ether	O	U042	T	---	---
		✔		Chlorofluorocarbons, degreasing solvent	O	F001	---	---	---
67 66 3	✔	✔		Chloroform	O	U044	T	X	---
74 87 3	✔	✔		Chloromethane	O	U045	I,T	I,X	---
107 30 2		✔		Chloromethoxymethane	O	U046	T	---	---
542 88 1	✔		bis-	Chloromethyl ether	O	---	---	X	EH
107 30 2		✔		Chloromethyl methyl ether	0	U046	T	---	---
100 44 7		✔		Chloromethylbenzene	O	P028	T	---	AH
50 18 0		✔		Chloromethyloxirane	O	U058	T	---	---
91 58 7		✔	2-	Chloronaphthalene	O	U047	T	---	---
91 58 7		✔	b-	Chloronaphthalene	O	U047	T	---	---
	✔		m-	Chloronitrobenzene	O	---	---	X	---
88 73 3	✔		o-	Chloronitrobenzene	O	---	---	X	---
100 00 5	✔		p-	Chloronitrobenzene	O	---	---	X	---
543 59 9	✔		1-	Chloropentane	O	---	---	I,X	---
95 57 8		✔	2-	Chlorophenol	O	U048	T	---	---
95 57 8		✔	o-	Chlorophenol	0	U048	T	---	---
5344 82 1		✔	2-	Chlorophenyl thiourea	O	P026	T	---	AH
5344 82 1		✔	o-	Chlorophenyl thiourea	0	P026	T	---	AH
		✔	3-	Chlorophenyl-, 4-chloro-2-butynyl ester	O	U280	T	---	---
76 06 2	✔			Chloropicrin	I/O	---	---	X	EH
75 29 6	✔		2-	Chloropropane	O	---	---	I	---
107 05 1	✔		3-	Chloropropene	O	---	---	I,X	---
542 76 7		✔	3-	Chloropropionitrile	O	P027	T	---	AH
106 89 8	✔	✔		Chloropropylene oxide	O	U041	T	I,X	---
7790 94 5	✔			Chlorosulfonic acid	I	---	---	I,C,R,X	EH
100 44 7	✔	✔	a-	Chlorotoluene	O	P028	T	X	AH
	✔		b-	Chlorovinyldichloroarsinine	O	---	---	X	EH
76 06 2	✔			Chlorpicrin	I/O	---	---	X	EH
13530 68 2	✔			Chromic acid	I	---	---	I,C,X	---
13765 19 0		✔		Chromic acid, calcium salt	I	U032	T	---	---
1333 82 0	✔			Chromic anhydride	I	---	---	I,C,X	---
10025 73 7	✔			Chromic chloride	I	---	---	X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
7788 97 8	✔			Chromic fluoride	I	---	---	X	---
1308 14 1	✔			Chromic hydroxide	I	---	---	X	---
1308 38 9	✔			Chromic oxide	I	---	---	X	---
10101 53 8	✔			Chromic sulfate	I	---	---	X	---
18540 29 9	✔			Chromium compounds	I	---	---	I,C,X	---
	✔			Chromium hydrozide	I	---	---	X	---
1308 38 9	✔			Chromium oxide	I	---	---	X	---
10101 53 8	✔			Chromium sulfate	I	---	---	X	---
10025 73 7	✔			Chromium trichloride	I	---	---	X	---
7788 97 8	✔			Chromium trifluoride	I	---	---	X	---
1333 82 0	✔			Chromium trioxide	I	---	---	I,C,X	---
14977 61 8	✔			Chromyl chloride	I	---	---	I,C,R,X	EH
218 01 9		✔		Chrysene	O	U050	T	---	---
	✔			Cleaning solvents	O	---	---	I	---
107 30 2	✔			CMME	O	---	---	I,X	EH
7440 48 4	✔			Cobalt (powder)	I	---	---	I,X	---
7789 43 7	✔			Cobalt bromide	I	---	---	X	---
1332 82 7	✔			Cobalt chloride	I	---	---	X	---
7440 48 4	✔			Cobalt compounds	I	---	---	X	---
10141 05 6	✔			Cobalt nitrate	I	---	---	I,X	---
	✔			Cobalt resinate	I	---	---	I,X	---
10124 43 3	✔			Cobalt sulfate	I	---	---	X	---
7789 43 7	✔			Cobaltous bromide	I	---	---	X	---
10141 05 6	✔			Cobaltous nitrate	I	---	---	I,X	---
	✔			Cobaltous resinate	I	---	---	I,X	---
10124 43 3	✔			Cobaltous sulfate	I	---	---	X	---
	✔			Cocculus	O	---	---	X	---
	✔			Collodian in ether and alcohol	O	---	---	I,R	---
62 74 8	✔	✔		Compound 1080	O	P058	T	X	AH,EH
	✔			Compound 1836	O	---	---	X	EH
470 90 6	✔			Compound 4072	O	---	---	X	EH
16753 36 9	✔			Copper acetoarsenite	O	---	---	X	EH
12363 64 3	✔			Copper acetylide	O	---	---	I,R	---
29871 13 4	✔			Copper arsenate	I	---	---	X	EH
	✔			Copper arsenite	I	---	---	X	EH
1344 67 8	✔			Copper chloride	I	---	---	X	---
	✔			Copper chlorotetrazole	I	---	---	I,R	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

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	✔			Copper compounds	I	---	---	X	---
544 92 3	✔	✔		Copper cyanide	I	P029	T	X	AH,EH
137 29 1		✔		Copper dimethyldithiocarbamate	O	U393	T	---	---
10402 29 6	✔			Copper nitrate	I	---	---	I,R,X	---
7758 98 7	✔			Copper sulfate	I	---	---	X	---
321 54 0	✔			Coroxon	O	---	---	X	EH
	✔			Corrosion inhibitor	I/O	---	---	C,X	---
117 52 2	✔			Coumafuryl	O	---	---	X	EH
	✔			Coumatertralyl	O	---	---	X	EH
8001 58 9		✔		Creosote	O	U051	T	---	---
1319 77 3		✔		Cresol	O	U052	T	---	---
1319 77 3		✔		Cresylic acid	O	U052	T	---	---
		✔		Cresylic acid, spent solvent	O	F004	---	---	---
535 89 7	✔			Crimidine	O	---	---	X	EH
4170 30 3	✔	✔		Crotonaldehyde	O	U053	T	X	EH
98 82 8	✔	✔		Cumene	O	U055	I	I,X	---
80 15 9	✔			Cumene hydroperoxide	O	---	---	I,X	---
64 00 6		✔	m-	Cumenyl methylcarbamate	O	P202	T	A	
	✔			Cupric arsenate	I	---	---	X	EH
10290 12 7	✔			Cupric arsenite	I	---	---	X	EH
7447 39 4	✔			Cupric chloride	I	---	---	X	---
4367 08 2	✔	✔		Cupric cyanide	I	P029	T	X	AH,EH
3251 23 8	✔			Cupric nitrate	I	---	---	I,R,X	---
7758 98 7	✔			Cupric sulfate	I	---	---	X	---
13426 91 0	✔			Cupriethylene diamine	O	---	---	X	---
57 12 5	✔	✔		Cyanides (soluble cyanide salts), not otherwise specified	I	P030	T	X	AH,EH
372 09 8	✔			Cyanoacetic acid	O	---	---	X	---
460 19 5	✔	✔		Cyanogen	I	P031	T	I,R,X	AH,EH
506 68 3	✔	✔		Cyanogen bromide	I	U246	T	X	---
506 77 4		✔		Cyanogen chloride	I	P033	T	---	AH
13067 93 1	✔			Cyanophenphos	O	---	---	X	EH
5637 83 2	✔			Cyanuric triazide	O	---	---	I,R	---
1134 23 2		✔		Cycloate	O	U386	T	---	---
291 64 5	✔			Cycloheptane	O	---	---	I,X	---
106 51 4		✔	2,5-	Cyclohexadiene-1,4-dione	O	U197	T	---	---
110 82 7	✔	✔		Cyclohexane	O	U056	I,T	I,X	---
58 89 9		✔		Cyclohexane,1,2,3,4,5,6-hexachloro-	O	U129	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

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108 94 1		✔		Cyclohexanone	O	U057	I	---	---
89714 27 2	✔			Cyclohexanone peroxide	O	---	---	I	---
		✔		Cyclohexanone, spent solvent	O	F003	---	---	---
	✔			Cyclohexenyltrichlorosilane	O	---	---	C,R,X	EH
66 81 9	✔			Cycloheximide	O	---	---	X	EH
131 89 5		✔	2-	Cyclohexyl-4,6-dinitrophenol	O	P034	T	---	AH
98 12 4	✔			Cyclohexyltrichlorosilane	O	---	---	C,R,X	EH
77 47 4		✔	1,3-	Cyclopentadiene, 1,2,3,4,5,5-hexachloro-	O	U130	T	---	---
287 92 3	✔			Cyclopentane	O	---	---	I,X	---
96 41 3	✔			Cyclopentanol	O	---	---	I	---
142 29 0	✔			Cyclopentene	O	---	---	I,X	---
50 18 0		✔		Cyclophosphamide	O	U058	T	---	---
	✔			Cyolan	O	---	---	X	EH
	✔		2,4-	D	O	---	---	X	EH
94 75 7	✔	✔	2,4-	D salts and esters	O	U240	T	---	---
115 90 2	✔			Dasanit	O	---	---	X	EH
	✔			Data processing fluid	O	---	---	I	---
20830 81 3		✔		Daunomycin	O	U059	T	---	---
533 74 4		✔		Dazomet	O	U366	T	---	---
96 12 8	✔	✔		DBCP	O	U066	T	X	EH
764 41 0	✔			DCB	O	---	---	X	EH
72 54 8		✔		DDD	O	U060	T	---	---
4682 03 5	✔			DDNP	O	---	---	I,R	---
50 29 3	✔	✔		DDT	O	U061	T	X	---
62 73 7	✔			DDVP	O	---	---	X	EH
	✔			DEAC	O	---	---	I,R	EH
177402 41 9	✔			Decaborane	I	---	---	I,R,X	EH
91 17 8	✔			Decahydronaphthalene	O	---	---	X	---
91 17 8	✔			Decalin	O	---	---	X	---
2385 85 5	✔			Dechlorane	O	---	---	X	EH
78 34 2	✔			Delnav	O	---	---	X	EH
	✔			Dementon-S-methyl sulfone	O	---	---	X	EH
8065 48 3	✔			Demeton	O	---	---	X	EH
		✔	2-	Deoxy-2-[(methylnitrosoamino)-carbonyl]amino-	O	U206	T	---	---
117 84 0		✔		Di-n-octyl phthalate	O	U107	T	---	---
298 04 4	✔	✔		Di-Syston	O	P039	T	X	AH,EH
2303 16 4		✔		Diallate	O	U062	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
108 45 2	✔		m-	Diaminobenzene	O	---	---	X	---
95 54 5	✔		o-	Diaminobenzene	O	---	---	X	---
106 50 3	✔		p-	Diaminobenzene	O	---	---	X	---
124 09 4	✔		1,6-	Diaminohexane	O	---	---	X	---
		✔		Diaminotoluene	O	U221	T	---	---
95 69 2	✔		2-	Diazo-4	O	---	---	I,R	---
115 02 6		✔		Diazoacetate (ester)	O	U015	T	---	---
4682 03 5	✔			Diazodinitrophenol	O	---	---	I,R	---
53 70 3		✔		Dibenz[a,h]anthracene	O	U063	T	---	---
189 55 9		✔		Dibenzo[a,i]pyrene	O	U064	T	---	---
94 36 0	✔			Dibenzoyl peroxide	O	---	---	I,R,X	---
19287 45 7	✔			Diborane	I	---	---	I,R	EH
19287 45 7	✔			Diboron hexahydride	I	---	---	I,R	EH
96 12 8	✔	✔	1,2-	Dibromo-3-chloropropane	O	U066	T	X	EH
106 93 4	✔	✔	1,2-	Dibromoethane	O	U067	T	X	---
74 95 3		✔		Dibromomethane	O	U068	T	---	---
142 96 1	✔		n-	Dibutyl ether	O	---	---	I,X	---
84 74 2		✔		Dibutyl phthalate	O	U069	T	---	---
		✔		Dibutylamino-thio methyl-,2,3-dihydro-2,2-dimethyl-7-benzofuranyl ester	O	P189	T	---	AH
		✔	3,3'-	Dichloro [1,1'-biphenyl]-4,4'-diamine	O	U021	T	---	---
764 41 0		✔	1,4-	Dichloro-2-butene	O	U074	I,T	---	---
		✔	3,5-	Dichloro-N-(l,l-dimethyl-2-propynyl)-	O	U192	T	---	---
	✔			Dichloro-S-triazine-2,4,6-trione	O	---	---	I,X	---
95 50 1		✔	1,2-	Dichlorobenzene	O	U070	T	---	---
541 73 1		✔	1,3-	Dichlorobenzene	O	U071	T	---	---
106 46 7		✔	1,4-	Dichlorobenzene	O	U072	T	---	---
541 73 1	✔	✔	m-	Dichlorobenzene	O	U071	T	X	---
95 50 1	✔	✔	o-	Dichlorobenzene	O	U070	T	X	---
106 46 7	✔	✔	p-	Dichlorobenzene	O	U072	T	X	---
95 50 1		✔	o-	Dichlorobenzene, spent solvent	O	U070	T	---	---
91 94 1	✔	✔	3,3'-	Dichlorobenzidine	O	U073	T	X	EH
75 71 8		✔		Dichlorodifluoromethane	O	U075	T	---	---
	✔			Dichlorodimethylsilan	O	---	---	I,C,R,X	EH
75 34 3		✔	1,1-	Dichloroethane	O	U076	T	---	---
107 06 2	✔	✔	1,2-	Dichloroethane	O	U077	T	I,X	---
75 35 4	✔	✔	1,1-	Dichloroethene	O	U078	T	I,X	---
156 60 5	✔	✔	1,2-	Dichloroethene	O	U079	T	I,X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
	✔			Dichloroether	O	---	---	I,X	---
111 44 4	✔	✔		Dichloroethyl ether	O	U025	T	I,X	---
598 14 1	✔			Dichloroethylarsine	O	---	---	I,R	EH
75 35 4		✔	1,1-	Dichloroethylene	O	U078	T	---	---
540 59 0	✔		1,2-	Dichloroethylene	O	---	---	I,X	---
72 54 8		✔	1,1'- 2,2-	Dichloroethylidene bis[4]-chlorobenzene	O	U060	T	---	---
2782 57 2	✔			Dichloroisocyanuric acid	O	---	---	I,X	---
108 60 1		✔		Dichloroisopropyl ether	O	U027	T	---	---
75 09 2	✔	✔		Dichloromethane	O	U080	T	X	---
111 91 1		✔		Dichloromethoxy ethane	O	U024	T	---	---
98 87 3		✔		Dichloromethylbenzene	O	U017	T	---	---
542 88 1		✔		Dichloromethylether	O	P016	T	---	AH
120 83 2		✔	2,4-	Dichlorophenol	O	U081	T	---	---
87 65 0		✔	2,6-	Dichlorophenol	O	U082	T	---	---
94 75 7	✔	✔	2,4-	Dichlorophenoxy-acetic acid, salts and esters	O	U240	T	X	EH
696 28 6		✔		Dichlorophenylarsine	O	P036	T	---	AH
78 87 5	✔	✔	1,2-	Dichloropropane	O	U083	T	I,X	---
542 75 6	✔	✔	1,3-	Dichloropropene	O	U084	T	I,X	---
542 75 6	✔	✔	1,3-	Dichloropropylene	O	U084	T	I,X	---
62 73 7	✔			Dichlorvos	O	---	---	X	EH
80.43 3	✔			Dicumyl peroxide	O	---	---	I,X	---
60 57 1	✔	✔		Dieldrin	O	P037	T	X	AH,EH
1464 53 5		✔	1,2:3,4-	Diepoxybutane	O	U085	I,T	---	---
311 45 5		✔		Diethyl 4-nitrophenyl ester	O	P041	T	---	AH
692 42 2		✔		Diethyl arsine	O	P038	T	---	AH
	✔			Diethyl chlorovinyl phosphate	O	---	---	X	EH
60 29 7	✔	✔		Diethyl ether	O	U117	I	I,R	---
297 97 2		✔	o,o-	Diethyl o-pyrazinyl phosphorothioate	O	P040	T	---	AH
84 66 2		✔		Diethyl phthalate	O	U088	T	---	---
3288 58 2		✔	o,o-	Diethyl S-methyl dithiophosphate	O	U087	T	---	---
56 53 1		✔	4,4-1,2	Diethyl-1,2-ethenediyl bis-phenol	O	U089	T	---	---
	✔		o-	Diethyl-o-(3-chloro-4-methylcoumarin-7-yl)phosphate	O	---	---	X	EH
	✔		o,o-	Diethyl-o-para-nitrophenyl phosphate	O	---	---	X	EH
56 38 2	✔	✔	o,o-	Diethyl-o-para-nitrophenyl phosphorothioate	O	P089	T	X	AH,EH
311 45 5		✔		Diethyl-p-nitrophenyl phosphate	O	P041	T	---	AH
	✔		o,o-	Diethyl-S-(isopropylthiomethyl) phosophorodithioate	O	---	---	X	EH
	✔		o,o-	Diethyl-S-carboethoxy-ethyl phosphorodithioate	O	---	---	X	EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

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California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
81 88 9	✔			Diethylaluminum chloride	O	---	---	I,R	EH
1116 54 7	✔			Diethylamine	O	---	---	I,X	---
1719 53 5	✔			Diethyldichlorosilane	O	---	---	I,C,R,X	EH
123 91 1	✔	✔	1,4-	Diethylene dioxide	O	U108	T	I,R,X	---
693 21 0	✔			Diethylene glycol dinitrate	O	---	---	I,R	---
5952 26 1		✔		Diethylene glycol, dicarbamate	O	U395	T	---	---
111 40 0	✔			Diethylene triamine	O	---	---	X	---
117 81 7		✔		Diethylhexyl phthalate	O	U028	T	---	---
1615 80 1		✔	n,n'-	Diethylhydrazine	O	U086	T	---	---
56 53 1		✔		Diethylstilbesterol	O	U089	T	---	---
557 20 0	✔			Diethylzinc	O	---	---	I,C,R	EH
13779 41 4	✔			Difluorophosphoric acid	I	---	---	C,R,X	EH
101 90 6	✔			Diglycidyl ether	O	---	---	X	EH
123 33 1		✔	1,2-	Dihydro-3,6-pyridazinedione	O	U148	T	---	---
		✔	1,2-	Dihydro-3-methyl-benz[j]aceanthrylene	O	U157	T	---	---
70 25 7		✔	2,3-	Dihydro-6-methyl-2-thioxo-	O	U164	T	---	---
94 58 6		✔		Dihydrosafrole	O	U090	T	---	---
3634 83 1		✔	1,3-	Diisocyanatomethyl-benzene	O	U223	R,T	---	---
108 20 3	✔			Diisopropyl ether	O	---	---	I,R	---
105 64 6	✔			Diisopropyl peroxydicarbonate	O	---	---	I,C,R,X	---
	✔			Diisopropylbenzene hydroperoxide	O	---	---	I,X	---
55 91 4		✔		Diisopropylfluorophosphate (DFP)	O	P043	T	---	AH
	✔			Dimecrom	O	---	---	X	EH
115 26 4	✔			Dimefox	O	---	---	X	EH
60 51 5		✔		Dimethoate	O	P044	T	---	AH
91 94 1		✔	3,3'-	Dimethoxy-[1,1'-biphenyl]-4,4'-diamine	O	U073	T	---	---
119 90 4		✔	3,3'-	Dimethoxybenzidine	O	U091	T	---	---
62 75 9	✔			Dimethyl dichlorovinyl phosphate	O	---	---	X	EH
57 14 7	✔	✔	1,1-	Dimethyl hydrazine	O	U098	T	I,X	EH
540 73 8		✔	1,2-	Dimethyl hydrazine	O	U099	T	---	---
62 75 9	✔	✔		Dimethyl nitrosoamine	O	P082	T	X	AH,EH
131 11 3		✔		Dimethyl phthalate	O	U102	T	---	---
77 78 1	✔	✔		Dimethyl sulfate	O	U103	T	X	EH
75 18 3	✔			Dimethyl sulfide	O	---	---	I,R,X	EH
		✔		Dimethyl, 3-methyl-1-(1-methylethyl)-1H-pyrazol-5-yl ester, carbamic acid	O	P192	T	---	AH
119 90 4		✔	3,3'-	Dimethyl-[1,1'-biphenyl]-4,4'-diamine	O	U091	T	---	---
22961 82 6		✔	2,2-	Dimethyl-1,3-benzodioxole-4-ol	O	U364	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
		✔	2,2-	Dimethyl-1,3-benzodioxole-4-ol, methyl carbamate	O	U278	T	---	---
60 11 7		✔	n,n-	Dimethyl-4-(phenylazo)-benzenamine	O	U093	T	---	---
122 09 8		✔	a,a-	Dimethyl-benzeneethanamine	O	P046	T	---	AH
91 80 5		✔	n,n-	Dimethyl-n'-2-pyridinyl-n'-(2-thienylmethyl)-1,2-ethanediamine	O	U155	T	---	---
124 40 3	✔	✔		Dimethylamine	O	U092	I	I,X	---
60 11 7		✔	p-	Dimethylaminoazobenzene	O	U093	T	---	---
29387 92 6	✔			Dimethylaminoazobenzene	O	---	---	X	EH
75 60 5	✔	✔		Dimethylarsinic acid	O	U136	T	X	EH
57 97 6		✔	7,12-	Dimethylbenz[a]anthracene	O	U094	T	---	---
1330 20 7		✔		Dimethylbenzene	O	U239	I,T	---	---
119 93 7		✔	3,3'-	Dimethylbenzidine	O	U095	T	---	---
80 15 9		✔	a,a-	Dimethylbenzylhydroperoxide	O	U096	R	I,X	---
75 83 2	✔		2-2-	Dimethylbutane	O	---	---	I,X	---
79 44 7		✔		Dimethylcarbamoyl chloride	I/O	U097	T	---	---
75 78 5	✔			Dimethyldichlorosilane	O	---	---	I,C,R,X	EH
3025 88 5	✔		2,5-	Dimethylhexane-2,5-dihydroperoxide	O	---	---	I	---
	✔			Dimethylnitrobenzene	O	---	---	X	---
		✔	a,a-	Dimethylphenethylamine	O	P046	T	---	AH
105 67 9		✔	2,4-	Dimethylphenol	O	U101	T	---	---
644 64 4		✔		Dimetilan	O	P191	T	A	
88 85 7	✔	✔	2,4-	Dinitro-6-sec-butylphenol	O	P020	T	X	AH/EH
543 52 1	✔	✔	4,6-	Dinitro-ortho-cresol	O	P047	T	X	AH,EH
97 02 9	✔		2,4-	Dinitroaniline	O	---	---	X	---
100 25 4	✔		o-	Dinitrobenzene	O	---	---	I,R	EH
25154 54 5	✔			Dinitrobenzene	O	---	---	I,R	EH
99 65 0	✔		m-	Dinitrobenzene	O	---	---	I,R	EH
100 25 4	✔		p-	Dinitrobenzene	O	---	---	I,R	EH
	✔		6-	Dinitrobenzene-1-oxide	O	---	---	I,R	---
97 00 7	✔			Dinitrochlorobenzene	O	---	---	I,R	---
66 56 8	✔		2,3-	Dinitrophenol	O	---	---	I,R	EH
51 28 5		✔	2,4-	Dinitrophenol	O	P048	T	---	AH
573 56 8	✔		2,6-	Dinitrophenol	O	---	---	I,R	EH
119 26 6	✔		2,4-	Dinitrophenylhydrazine	O	---	---	I,R,X	---
121 14 2	✔	✔	2,4-	Dinitrotoluene	O	U105	T	I,R,X	---
606 20 2		✔	2,6-	Dinitrotoluene	O	U106	T	---	---
621 14 2	✔		3,4-	Dinitrotoluene	O	---	---	I,R,X	---
618 85 9	✔		3,5-	Dinitrotoluene	O	---	---	I,R,X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
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88 85 7	✔	✔		Dinoseb	O	P020	T	X	AH/EH
117 84 0		✔		Dioctyl ester	O	U107	T	---	---
117 84 0		✔	n-	Dioctylphthalate	O	U107	T	---	---
123 91 1	✔	✔	1,4-	Dioxane	O	U108	T	I,R,X	---
78 34 2	✔			Dioxathion	O	---	---	X	EH
1746 01 6	✔			Dioxin	O	---	---	X	EH
13184 80 0	✔			Dipentaerythritol hexanitrate	O	---	---	R	---
92 54 4	✔			Diphenyl	O	---	---	X	EH
156 10 5	✔			Diphenylamine	O	---	---	X	---
578 94 9	✔			Diphenylamine chloroarsine	O	---	---	X	EH
80 10 4	✔			Diphenyldichlorosilane	O	---	---	C,R,X	EH
122 66 7		✔	1,2-	Diphenylhydrazine	O	U109	T	---	---
152 16 9		✔		Diphosphoramide, octamethyl-	O	P085	T	---	AH
107 49 3		✔		Diphosphoric acid, tetraethyl ester	O	P111	T	---	AH
131 73 7	✔			Dipicrylamine	O	---	---	I,R	---
111 43 3	✔			Dipropyl ether	O	---	---	I,X	---
142 84 7		✔		Dipropylamine	O	U110	I	---	---
97 77 8		✔		Disulfiram	O	U403	T	---	---
298 04 4	✔	✔		Disulfoton	O	P039	T	X	AH,EH
7791 27 7	✔			Disulfuryl chloride	I	---	---	C,R,X	EH
541 53 7		✔		Dithiobiuret	O	P049	T	---	AH
572 48 5	✔			Dithione	O	---	---	X	EH
124 40 3	✔	✔		DMA	O	U092	I	I,X	---
	✔		di-n-	Dodecyl peroxide	O	---	---	I,C,R,X	---
4484 72 4	✔			Dodecyltrichlorosilane	O	---	---	C,R,X	EH
315 18 4	✔			DOWCO-139	O	---	---	X	EH
132 27 4	✔	✔		Dowicide	O	F027	---	X	---
	✔			Dowicide I	O	---	---	X	EH
99 66 1	✔			DPA	O	---	---	X	---
	✔			Drilling fluids	I/O	---	---	C,X	---
	✔			Drilling mud	I	---	---	X	---
	✔			Dufonate	O	---	---	X	EH
	✔			Dyes	O	---	---	X	---
151 56 4	✔			EI	O	---	---	I,R,X	EH
115 29 7	✔	✔		Endosulfan	O	P050	T	X	AH,EH
145 73 3	✔	✔		Endothal	O	P088	T	X	AH,EH
2778 04 3	✔			Endothion	O	---	---	X	EH

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72 20 8	✔	✔		Endrin and 8 metabolites	O	P051	T	X	AH,EH
106 89 8	✔	✔		Epichlorohydrin	O	U041	T	I,X	---
51 43 4		✔		Epinephrine	O	P042	T	---	AH
2104 64 5	✔			EPN	O	---	---	X	EH
75 21 8	✔	✔		Epoxyethane	O	U115	I,T	I,R,X	---
2238 07 5	✔		bis-2,3-	Epoxypropyl ether	O	---	---	X	EH
759 94 4		✔		EPTC	O	U390	T	---	---
	✔			Etching acid liquid or solvent	I	---	---	I,C	---
75 07 0		✔		Ethanal	O	U001	I	---	---
75 04 7		✔		Ethanamine	O	U404	T	---	---
55 18 5		✔		Ethanamine, n-ethyl-n-nitroso-	O	U174	T	---	---
60 29 7		✔		Ethane	O	U117	T	---	---
111 91 1		✔		Ethane, 1,1'-[methylenebis(oxy)]bis[2-chloro-	O	U024	T	---	---
111 44 4		✔		Ethane, 1,1'-oxybis[2-chloro-	O	U025	T	---	---
60 29 7		✔		Ethane, 1,1'oxybis-(1)	O	U117	T	---	---
630 20 6		✔		Ethane, 1,1,1,2-tetrachloro-	O	U208	T	---	---
71 55 6		✔		Ethane, 1,1,1-trichloro-	O	U226	T	---	---
79 34 5		✔		Ethane, 1,1,2,2-tetrachloro-	O	U209	T	---	---
79 00 5		✔		Ethane, 1,1,2-trichloro-	O	U227	T	---	---
75 34 3		✔		Ethane, 1,1-dichlo-	O	U076	T	---	---
106 93 4		✔		Ethane, 1,2-dibromo-	O	U067	T	---	---
107 06 2		✔		Ethane, 1,2-dichloro-	O	U077	T	---	---
67 72 1		✔		Ethane, hexachloro-	O	U131	T	---	---
76 01 7		✔		Ethane, pentachloro-	O	U184	T	---	---
91 80 5		✔	1,2-	Ethanediamine, n,n-dimethyl-n'-2-pyridinyl-n'-(2-thienylmethyl)-	O	U155	T	---	---
460 19 5		✔		Ethanedinitrile	O	P031	T	---	AH
62 55 5		✔		Ethanethioamide	O	U218	T	---	---
75 08 1	✔			Ethanethiol	O	---	---	I,R,X	EH
16752 77 5		✔		Ethanimidothioic acid	O	P066	T	---	AH
64 17 5	✔			Ethanol	O	---	---	I,X	---
1116 54 7		✔		Ethanol, 2,2'-(nitrosoimino)bis-	O	U173	T	---	---
110 80 5		✔		Ethanol, 2-ethoxy-	O	U359	T	---	---
98 86 2		✔		Ethanone, 1-phenyl-	O	U004	T	---	---
110 75 8		✔		Ethene, (2-chloroethoxy)-	O	U042	T	---	---
75 35 4		✔		Ethene, 1,1-dichloro-	O	U078	T	---	---
156 60 5		✔		Ethene, 1,2-dichloro-	O	U079	T	---	---
75 01 4		✔		Ethene, chloro-	O	U043	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
127 18 4		✔		Ethene, tetrachloro-	O	U210	T	---	---
79 01 6		✔		Ethene, trichloro-	O	U228	T	---	---
563 12 2	✔			Ethion	O	---	---	X	EH
110 80 5		✔	2-	Ethoxy ethanol	O	U359	T	---	---
62 44 2		✔	n-4-	Ethoxyphenyl-acetamide	O	U187	T	---	---
141 78 6	✔	✔		Ethyl acetate	O	U112	I	I,X	---
		✔		Ethyl acetate, spent solvent	O	F003	---	---	---
140 88 5		✔		Ethyl acrylate	O	U113	I	---	---
64 17 5	✔			Ethyl alcohol	O	---	---	I,X	---
		✔		Ethyl benzene, spent solvent	O	F003	---	---	---
105 54 4	✔			Ethyl butanoate	O	---	---	I	---
105 54 4	✔			Ethyl butyrate	O	---	---	I	---
51 79 6		✔		Ethyl carbamate	O	U238	T	---	---
75 00 3	✔			Ethyl chloride	O	---	---	I,X	---
541 41 3	✔			Ethyl chlorocarbonate	O	---	---	I,C,R,X	EH
541 41 3	✔			Ethyl chloroformate	O	---	---	I,C,R,X	EH
107 12 0		✔		Ethyl cyanide	O	P101	T	---	AH
60 29 7	✔	✔		Ethyl ether	O	U117	I	I,R	---
		✔		Ethyl ether, spent solvent	O	F003	---	---	---
109 94 4	✔			Ethyl formate	O	---	---	I,X	---
75 08 1	✔			Ethyl mercaptan	O	---	---	I,R,X	EH
97 63 2		✔		Ethyl methacrylate	O	U118	T	---	---
62 50 0		✔		Ethyl methanesulfonate	O	U119	T	---	---
	✔			Ethyl methyl phosphoryl N, N-diisopropyl thiocholine	O	---	---	X	---
625 58 1	✔			Ethyl nitrate	O	---	---	I,R	---
109 95 5	✔			Ethyl nitrite	O	---	---	I,R	---
2104 64 5	✔		o-	Ethyl o-para-nitrophenyl phenylphosphonothioate	O	---	---	X	EH
105 37 3	✔			Ethyl propionate	O	---	---	I	---
14324 55 1		✔		Ethyl Ziram	O	U407	T	---	---
13194 48 4	✔		o-	Ethyl-S,S-dipropyl phosphorodithioate	O	---	---	X	EH
75 04 7	✔			Ethylamine	O	---	---	I,X	---
100 41 4	✔			Ethylbenzene	O	---	---	I,X	---
598 14 1	✔			Ethyldichloroarsine	O	---	---	I,R	EH
1789 58 8	✔			Ethyldichlorosilane	O	---	---	I,C,R,X	EH
109 78 4	✔			Ethylene cyanohydrin	O	---	---	I,R	EH
107 15 3	✔			Ethylene diamine	O	---	---	X	---
106 93 4	✔	✔		Ethylene dibromide	O	U067	T	X	---

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California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
107 06 2	✔	✔		Ethylene dichloride	O	U077	T	I,X	---
110 80 5		✔		Ethylene glycol monoethyl ether	O	U359	T	---	---
	✔			Ethylene gylcol dinitrate	O	---	---	R	---
75 21 8	✔	✔		Ethylene oxide	O	U115	I,T	I,R,X	---
151 56 4		✔		Ethyleneamine	O	P054	T	---	AH
111 54 6		✔		Ethylenebisdithiocarbamic acid, salts, 8 esters	O	U114	T	---	---
151 56 4	✔			Ethyleneimine	O	---	---	I,R,X	EH
96 45 7		✔		Ethylenethiourea	O	U116	T	---	---
		✔	di-2-	Ethylhexyl phthalate, Bis (2-ethylhexyl) phthalate	O	U028	T	---	---
75 34 3		✔		Ethylidene dichloride	O	U076	T	---	---
	✔			Ethylphenyldichlorosilane	O	---	---	C,R,X	EH
115 21 9	✔			Ethyltrichlorosilane	O	---	---	I,R	EH
	✔			Exothian	O	---	---	X	EH
52 85 7		✔		Famphur	O	P097	T	---	AH
115 90 2	✔			Fensulfothion	O	---	---	X	EH
14484 64 1		✔		Ferbam	O	U396	T	---	---
10102 49 5	✔			Ferric arsenate	I	---	---	X	EH
7705 08 0	✔			Ferric chloride	I	---	---	C,X	---
10102 50 8	✔			Ferrous arsenate	I	---	---	X	EH
	✔			Fishberry	O	---	---	X	---
	✔			Fluoboric acid	O	---	---	C,X	EH
206 44 0		✔		Fluoranthene	I	U120	T	---	---
	✔			Fluoride salts	I	---	---	X	---
7782 41 4	✔	✔		Fluorine	I	P056	T	C,R,X	AH,EH
640 19 7	✔	✔		Fluoroacetanilide	O	P057	T	X	AH,EH
	✔	✔		Fluoroacetic acid and salts	O	P058	T	X	AH,EH
16872 11 0	✔			Fluoroboric acid	O	---	---	C,X	EH
7789 21 1	✔			Fluorosulfonic acid	I	---	---	C,R,X	EH
16961 83 4	✔			Fluosilicic acid	I	---	---	C,X	---
7789 21 1	✔			Fluosulfonic acid	I	---	---	C,R,X	EH
	✔			Fly ash	I	---	---	C,X	---
944 22 9	✔			Fonofos	O	---	---	X	EH
50 00 0	✔	✔		Formaldehyde	O	U122	T	I,X	---
23422 53 9		✔		Formetanate hydrochloride	O	P198	T		AH
64 18 6	✔	✔		Formic acid	O	U123	C,T	C,X	---
17702 57 7		✔		Formparanate	O	P197	T	A	
	✔			Fuel waste	O	---	---	I,X	---

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Toxic Waste	T	X
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Extremely Hazardous		EH

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California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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	✔			Fulminate of mercury	O	---	---	I,R	---
628 86 4		✔		Fulminic acid	O	P065	R,T	---	AH
117 52 2	✔			Fumarin	O	---	---	X	EH
96 12 8	✔	✔		Fumazone	O	U066	T	X	EH
8014 95 7	✔			Fuming sulfuric acid	I	---	---	C,R,X	EH
1563 66 2	✔			Furadan	O	---	---	X	EH
110 00 9	✔	✔		Furan	O	U124	I	I,R,X	---
109 99 9		✔		Furan, tetrahydro-	O	U213	I	---	---
98 01 1		✔	2-	Furancarboxaldehyde	O	U125	I	---	---
108 31 6		✔	2,5-	Furandione	O	U147	T	---	---
98 01 1		✔		Furfural	O	U125	I	---	---
110 00 9	✔	✔		Furfuran	O	U124	I	I,R,X	---
8006 61 9	✔			Gasoline	O	---	---	I	---
18883 66 4		✔	d-	Glucopyranose, 2-deoxy-2-(3-methyl-3-nitrosoureido)-	O	U206	T	---	---
50 99 7		✔	d-	Glucose	O	U206	T	---	---
111 30 8	✔			Glutaraldehyde	O	---	---	X	---
	✔			Glycerolmonolactate trinitrate	O	---	---	R	---
765 34 4		✔		Glycidylaldehyde	O	U126	T	---	---
628 96 6	✔			Glycol dinitrate	O	---	---	R	---
	✔			Gold cyanate	O/I	---	---	R	---
129162 38 5	✔			Gold fulminate	O/I	---	---	R	---
70 25 7		✔		Guanidine	O	U163	T	---	---
506 93 4	✔			Guanidine nitrate	O	---	---	I,R	---
	✔			Guanyl nitrosaminoguanylidene hydrazine	O	---	---	R	---
86 50 0	✔			Guthion	O	---	---	X	EH
7440 58 6	✔			Hafnium	I	---	---	I,R,X	---
115 26 4	✔			Hanane	O	---	---	X	EH
76 44 8	✔	✔		Heptachlor	O	P059	T	X	AH,EH
142 82 5	✔		n-	Heptane	O	---	---	I,X	---
	✔		I-	Heptane	O	---	---	I,X	---
757 58 4	✔	✔		HETP	O	P062	T	X	AH
	✔			Hexachloride benzene	O	---	---	X	EH
101 55 3		✔		Hexachloro-1,3-butadiene	O	U030	T	---	---
77 47 4		✔	1,2,3,4,5,5-	Hexachloro-1,3-cyclopentadiene	O	U130	T	---	---
118 74 1		✔		Hexachlorobenzene	O	U127	T	---	---
87 68 3		✔		Hexachlorobutadiene	O	U128	T	---	---
58 89 9		✔	1,2,3,4,5,6-	Hexachlorocyclohexane	O	U129	T	---	---

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CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
77 47 4		✔		Hexachlorocyclopentadiene	O	U130	T	---	---
67 72 1		✔		Hexachloroethane	O	U131	T	---	---
70 30 4		✔		Hexachlorophene	O	U132	T	---	---
1888 71 7		✔	1,1,2,3,3,3-	Hexachloropropene	O	U243	T	---	---
1888 71 7		✔		Hexachloropropene	O	U243	T	---	---
5894 60 0	✔			Hexadecyltrichlorosilane	I	---	---	C,R,X	EH
757 58 4	✔	✔		Hexaethyl tetraphosphate	O	P062	T	X	AH
16940 81 1	✔			Hexafluorophosphoric acid	I	---	---	C,X	---
110 82 7		✔		Hexahydrobenzene	O	U056	I	---	---
124 09 4	✔			Hexamethylenediamine	O	---	---	X	---
	✔		I-	Hexane (and isomers)	O	---	---	I,X	---
	✔		n-	Hexane (and isomers)	O	---	---	I,X	---
131 73 7	✔			Hexanitrodiphenyl amine	O	---	---	I,R	---
111 26 2	✔		n-	Hexylamine	O	---	---	I,X	---
928 65 4	✔			Hexyltrichlorosilane	I	---	---	C,R,X	EH
1305 62 0	✔			Hydrated lime	I	---	---	C	---
57 14 7	✔	✔		Hydrazine	O	U098	R,T	I,X	EH, AH
14546 44 2	✔			Hydrazine azide	I	---	---	I,R	---
	✔			Hydrazine, diamine	I	---	---	I,X	EH
60 34 4		✔		Hydrazine, methyl-	O	P068	T	---	AH
79 19 6		✔		Hydrazinecarbothioamide	O	P116	T	---	AH
7782 79 8	✔			Hydrazoic acid	I	---	---	I,R	---
10034 85 2	✔			Hydriodic acid	I	---	---	C,R,X	EH
10035 10 6	✔			Hydrobromic acid	I	---	---	C,R,X	EH
7647 01 0	✔			Hydrochloric acid	I	---	---	C,R,X	EH
74 90 8	✔	✔		Hydrocyanic acid	I	P063	T	I,R,X	AH,EH
7664 39 3	✔	✔		Hydrofluoric acid	I	U134	C,T	C,R,X	EH
56977 47 0	✔			Hydrofluosilicic acid	I	---	---	C,X	---
7782 79 8	✔			Hydrogen azide	I	---	---	I,R	---
10035 10 6	✔			Hydrogen bromide	I	---	---	C,R,X	EH
7647 01 0	✔			Hydrogen chloride	I	---	---	C,R,X	EH
74 90 8	✔	✔		Hydrogen cyanide	I	P063	T	I,R,X	AH,EH
7664 39 3	✔	✔		Hydrogen fluoride	I	U134	C,T	C,R,X	EH
10034 85 2	✔			Hydrogen iodide	I	---	---	C,R,X	EH
7722 84 1	✔			Hydrogen peroxide	I	---	---	I,C,R,X	---
7803 51 2	✔	✔		Hydrogen phosphide	I	P096	T	I,X	AH,EH
7783 07 5	✔			Hydrogen selenide	I	---	---	I,X	EH

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7783 06 4	✔	✔		Hydrogen sulfide	I	U135	T	I,X	EH
80 15 9		✔		Hydroperoxide	O	U096	R	---	---
75 86 5		✔	2-	Hydroxy-2-methylpropanenitrile	O	P069	T	---	AH
		✔	4-	Hydroxy-3-(3-oxo-1-phenylbutyl)-2H-1-Benozopyran-2-one, & salts < 0.3 %	O	P001	T	---	---
55285 14 8		✔	2-	Hydroxy-benzoic acid, compd. with (3aS-cis)-1,2,3,3a,8,8a-hexahydro-1,3a,8-trimethylpyrrolo[2,3-b]...	O	P188	T	---	---
	✔		3-	Hydroxy-n-cis-crotonamide	O	---	---	X	EH
109 78 4	✔		b-	Hydroxypropionitrile	O	---	---	I,R	EH
122 66 7		✔		Hydrozobenzene	O	U109	T	---	---
	✔			Hypochlorite compounds	I	---	---	I,C,R,X	EH
96 45 7		✔	2-	Imidazolidinethione	O	U116	T	---	---
193 39 5		✔		Indeno[1,2,3-cd]pyrene	O	U137	T	---	---
7440 74 6	✔			Indium	I	---	---	X	---
	✔			Indium compounds	I/O	---	---	X	---
	✔			Insecticides	O	---	---	X	---
7790 99 0	✔			Iodine monochloride	I	---	---	C,R,X	---
74 88 4		✔		Iodomethane	O	U138	T	---	---
7705 08 0	✔			Iron (III) chloride	I	---	---	C,X	---
	✔			Iron arsenate	I	---	---	X	EH
297 78 9	✔			Isobenzan	O	---	---	X	EH
85 44 9		✔	1,3-	Isobenzofurandione	O	U190	T	---	---
		✔		Isobutanol, spent solvent	O	F005	---	---	---
78 83 1		✔		Isobutyl alcohol	O	U140	I,T	---	---
624 83 9		✔		Isocyanatomethane	O	P064	T	---	AH
465 73 6		✔		Isodrin	O	P060	T	---	AH
55 91 4		✔		Isofluorphate	O	P043	T	---	AH
119 38 0		✔		Isolan	O	P192	T	---	AH
540 84 1	✔			Isooctane	O	---	---	I,X	---
11071 47 9	✔			Isooctene	O	---	---	I	---
78 78 4	✔			Isopentane	O	---	---	I	---
78 79 5	✔			Isoprene	O	---	---	I,R,X	---
67 63 0	✔			Isopropanol	O	---	---	I,X	---
108 21 4	✔			Isopropyl acetate	O	---	---	I,X	---
98 82 8	✔	✔		Isopropyl benzene	O	U055	I	I,X	---
75 29 6	✔			Isopropyl chloride	O	---	---	I	---
108 20 3	✔			Isopropyl ether	O	---	---	I,R	---
75 33 2	✔			Isopropyl mercaptan	O	---	---	I,X	---
	✔			Isopropyl methyl phosphoryl fluoride	O	---	---	X	EH

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	✔			Isopropyl percarbonate	O	---	---	I,C,R,X	---
75 31 0	✔			Isopropylamine	O	---	---	I,X	---
64 00 6		✔	m-	Isopropylphenyl-n-methylcarbamate	O	P202	T	X	AH,EH
	✔			Isoproyl alcohol	O	---	---	I,X	---
120 58 1		✔		Isosafrole	O	U141	T	---	---
143 50 0	✔	✔		Kepone	O	U142	T	X	EH
	✔			Laboratory waste	I/O	---	---	I,C,R,X	---
	✔			LAH	I	---	---	I,C,R	EH
16752 77 5	✔	✔		Lannate	O	P066	T	X	AH,EH
303 34 4		✔		Lasiocarpine	O	U143	T	---	---
105 74 8	✔			Lauroyl peroxide	O	---	---	I,C,R,X	---
	✔			Lead 2,4-ditnitroresorcinate	O	---	---	I,R	---
301 04 2	✔	✔		Lead acetate	O	U144	T	X	---
3687 31 8	✔			Lead arsenate	I	---	---	X	EH
	✔			Lead arsenite	I	---	---	X	EH
13424 46 9	✔			Lead azide	I	---	---	I,R	---
598 63 0	✔			Lead carbonate	I	---	---	X	---
	✔			Lead chlorite	I	---	---	I,R	---
7439 92 1	✔			Lead compounds	I/O	---	---	X	---
	✔			Lead cyanide	I	---	---	X	EH
	✔			Lead mononitroresorcinate	O	---	---	I,R	---
10099 74 8	✔			Lead nitrate	I	---	---	I,X	---
	✔			Lead orthoarsenate	I	---	---	X	EH
1309 60 0	✔			Lead oxide	I	---	---	X	---
7446 27 7		✔		Lead phosphate	I	U145	T	---	---
15245 44 0	✔			Lead styphnate	O	---	---	I,R	---
1335 32 6		✔		Lead subacetate	O	U146	T	---	---
15245 44 0	✔			Lead trinitroresorcinate	O	---	---	I,R	---
1335 32 6		✔		Lead, bis(acetato-O)tetrahydroxytri-	O	U146	T	---	---
541 25 3	✔			Lewisite	O	---	---	X	EH
	✔			Lime	I	---	---	C	---
	✔			Lime and sulfur sludge	I	---	---	C	---
	✔			Lime and water	I	---	---	C	---
	✔			Lime nitrate	I	---	---	I,R	---
	✔			Lime sludge	I	---	---	C	---
	✔			Lime wastewater	I	---	---	C	---
58 89 9		✔		Lindane	O	U129	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
	✔			Liquid cement	I	---	---	I	---
7439 93 2	✔			Lithium	I	---	---	I,C,R	EH
16853 85 3	✔			Lithium aluminum hydride	I	---	---	I,C,R	EH
7782 89 0	✔			Lithium amide	I	---	---	I,C,R	EH
70399 13 2	✔			Lithium ferrosilicon	I	---	---	I,R	EH
7580 67 8	✔			Lithium hydride	I	---	---	I,C,R	EH
13840 33 0	✔			Lithium hypochlorite	I	---	---	I,C,R,X	EH
12031 80 0	✔			Lithium peroxide	I	---	---	I,C,R	---
	✔			Lithium silicon	I	---	---	I,R	---
	✔			London purple, (Mixture of As2O3, aniline, lime and FeO)	I/O	---	---	X	EH
	✔			Lye	I	---	---	C,X	---
70 25 7		✔		M N N G	O	U163	T	---	---
7439 95 4	✔			Magnesium	I	---	---	I,R	EH
10103 50 1	✔			Magnesium arsenate	I	---	---	X	EH
	✔			Magnesium arsenite	I	---	---	X	EH
10326 21 3	✔			Magnesium chlorate	I	---	---	I,R	---
14452 57 4	✔			Magnesium dioxide	I	---	---	I	---
10377 60 3	✔			Magnesium nitrate	I	---	---	I,R	---
10034 81 8	✔			Magnesium perchlorate	I	---	---	I,R,X	---
1335 26 8	✔			Magnesium peroxide	I	---	---	I	---
108 31 6	✔	✔		Maleic anhydride	O	U147	T	X	EH
123 33 1		✔		Maleic hydrazide	O	U148	T	---	---
	✔			Malonic nitrile	O	---	---	X	---
109 77 3		✔		Malononitrile	O	U149	T	---	---
	✔			Manganese (powder)	I	---	---	I	---
638 38 0	✔			Manganese acetate	O	---	---	X	---
7784 38 5	✔			Manganese arsenate	I	---	---	X	EH
12738 03 3	✔			Manganese bromide	I	---	---	X	---
7773 01 5	✔			Manganese chloride	I	---	---	X	---
15339 36 3		✔		Manganese dimethyldithiocarbamate	O	P196	T	---	AH
	✔			Manganese methylcyclopentadienyl tricarbonyl	O	---	---	X	---
10377 66 9	✔			Manganese nitrate	I	---	---	I,X	---
	✔			Manganous arsenate	I	---	---	X	EH
13446 03 2	✔			Manganous bromide	I	---	---	X	---
111283 62 6	✔			Manganous chloride	I	---	---	X	---
10377 66 9	✔			Manganous nitrate	I	---	---	I,X	---
15825 70 4	✔			Mannitol hexanitrate	O	---	---	R	---

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CHARACTERISTICS:	FEDERAL	STATE
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Acutely Hazardous	AH	
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72 43 5	✔	✔		Marlate	O	U247	T	X	EH
7783 33 7	✔			Mayer's reagent	I	---	---	X	---
56 49 5	✔			MCA	O	---	---	C,X	---
2487 01 6	✔			Medinoterb acetate	O	---	---	X	EH
148 82 3		✔		Melphalan	O	U150	T	---	---
	✔			Memtetrahydrophthalic anhydride	O	---	---	X	---
80 47 7	✔		p-	Menthane hydroperoxide	O	---	---	I	---
	✔			Mercarbam	O	---	---	X	EH
1600 27 7	✔			Mercuric acetate	O	---	---	X	---
10124 48 8	✔			Mercuric ammonium chloride	I	---	---	X	---
583 15 3	✔			Mercuric benzoate	O	---	---	X	---
7789 47 1	✔			Mercuric bromide	I	---	---	X	---
7487 94 7	✔			Mercuric chloride	I	---	---	X	EH
	✔			Mercuric cyanate	O	---	---	I,R	---
592 04 1	✔			Mercuric cyanide	I	---	---	X	EH
	✔			Mercuric dioxysulfate	I	---	---	X	---
7774 29 0	✔			Mercuric iodide	I	---	---	X	---
10045 94 0	✔			Mercuric nitrate	I	---	---	I,X	---
1191 80 6	✔			Mercuric oleate	O	---	---	X	---
	✔			Mercuric oxide (red and yellow)	I	---	---	I,X	---
1335 31 5	✔			Mercuric oxycyanide	I	---	---	I,R	---
7783 33 7	✔			Mercuric potassium iodide	I	---	---	X	---
5970 32 1	✔			Mercuric salicylate	O	---	---	X	---
1312 03 4	✔			Mercuric subsulfate	I	---	---	X	---
7783 35 9	✔			Mercuric sulfate	I	---	---	X	---
	✔			Mercuric thiocyanide	I	---	---	X	---
12002 19 6	✔			Mercurol	O	---	---	X	---
10031 18 2	✔			Mercurous bromide	I	---	---	X	---
	✔			Mercurous gluconate	O	---	---	X	---
7783 30 4	✔			Mercurous iodide	I	---	---	X	---
10415 75 5	✔			Mercurous nitrate	I	---	---	I,R	---
15829 53 5	✔			Mercurous oxide	I	---	---	X	---
7783 36 0	✔			Mercurous sulfate	I	---	---	X	---
7439 97 6	✔	✔		Mercury	I	U151	T	X	EH
1600 27 7	✔			Mercury acetate	O	---	---	X	---
583 15 3	✔			Mercury benzoate	O	---	---	X	---
7783 35 9	✔			Mercury bisulfate	I	---	---	X	---

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Reactive Waste	R	R
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Acutely Hazardous	AH	
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10031 18 2	✔			Mercury bromide	I	---	---	X	---
7487 94 7	✔			Mercury chloride	I	---	---	X	EH
	✔			Mercury compounds	I/O	---	---	X	EH
	✔			Mercury cyanide	I	---	---	X	EH
628 86 4		✔		Mercury fulminate	O	P065	R,T	---	AH
37320 91 5	✔			Mercury iodide	I	---	---	X	---
10045 94 0	✔			Mercury nitrate	I	---	---	I,X	---
12002 19 6	✔			Mercury nucleate	O	---	---	X	---
1191 80 6	✔			Mercury oleate	O	---	---	X	---
13766 44 4	✔			Mercury sulfate	I	---	---	X	---
53408 91 6	✔			Mercury thiocyanate	I	---	---	X	---
		✔		Mercury(2+) salt	O	P065	R,T	---	AH
7439 97 6		✔		Mercury, (acetato-O)phenyl-	O	P092	T	---	AH
	✔			Metaisosystox-sulfon	O	---	---	X	EH
	✔			Metal carbonyls	I	---	---	X	---
	✔			Metal hydrides	I	---	---	I,R	EH
	✔			Metal powders	I	---	---	I,X	---
137 42 8		✔		Metam Sodium	O	U384	T	---	---
126 98 7		✔		Methacrylonitrile	O	U152	I,T	---	---
50 00 0	✔	✔		Methanal	O	U122	T	I,X	---
124 40 3		✔		Methanamine, n-methyl-	O	U092	I	---	---
62 75 9		✔		Methanamine, n-methyl-n-nitroso-	O	P082	T	---	AH
74 83 9		✔		Methane, bromo-	O	U029	T	---	---
74 83 9		✔		Methane, chloro-	O	U045	I,T	---	---
107 30 2		✔		Methane, chloromethoxy-	O	U046	T	---	---
74 95 3		✔		Methane, dibromo-	O	U068	T	---	---
75 09 2		✔		Methane, dichloro-	O	U080	T	---	---
75 71 8		✔		Methane, dichlorodifluoro-	O	U075	T	---	---
74 88 4		✔		Methane, iodo-	O	U138	T	---	---
624 83 9		✔		Methane, isocyanato-	O	P064	T	---	AH
542 88 1		✔		Methane, oxybis[chloro-	O	P016	T	---	AH
56 23 5	✔	✔		Methane, tetrachloro-	O	U211	T	X	---
509 14 8	✔	✔		Methane, tetranitro-	O	P112	R	I,R,X	AH,EH
75 25 2		✔		Methane, tribromo-	O	U225	T	---	---
67 66 3		✔		Methane, trichloro-	O	U044	T	---	---
75 69 4		✔		Methane, trichlorofluoro-	O	U121	T	---	---
62 50 0		✔		Methanesulfonic acid, ethyl ester	O	U119	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
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Toxic Waste	T	X
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74 93 1	✔	✔		Methanethiol	O	U153	I,T	I,X	---
75 70 7		✔		Methanethiol, trichloro-	O	P118	T	---	AH
57 74 9		✔	4,7-	Methano-1H-indene, 1,2,4,5,6,7,8,8-octachloro-2,3,3a,4,7,7a-hexahydro-	O	U036	T	---	---
76 44 8		✔	4,7-	Methano-1H-indene, 1,4,5,6,7,8,8-heptachloro-3a,4,7,7a-tetrahydro-	O	P059	T	---	AH
		✔		Methanobenzodioxathiepinhexachlorohexahydro-oxide	O	P050	T	---	AH
64 18 6	✔	✔		Methanoic acid	O	U123	C,T	C,X	---
67 56 1	✔	✔		Methanol	O	U154	I	I,X	---
		✔		Methanol, spent solvent	O	F003	---	---	---
143 50 0		✔		Methenocyclobuta[cd]pentalenonedecachlorooctahydro-etc.	O	U142	T	---	---
716 16 5		✔		Methiocarb	O	P199	T	---	AH
16752 77 5	✔	✔		Methomyl	O	P066	T	X	AH,EH
72 43 5	✔	✔		Methoxychlor	O	U247	T	X	EH
123 88 6	✔			Methoxyethylmercuric chloride	O	---	---	X	EH
97 63 2		✔	2-	Methyl - 2-propenoic acid, ethyl ester	O	U118	T	---	---
80 62 6		✔	2-	Methyl - 2-propenoic acid, methyl ester	O	U162	I,T	---	---
79 20 9	✔			Methyl acetate	O	---	---	I,X	---
	✔			Methyl acetone	O	---	---	I,X	---
67 56 1	✔	✔		Methyl alcohol	O	U154	I	I,X	---
74 83 9	✔	✔	2-	Methyl bromide	O	U029	T	X	EH
78 78 4	✔		2-	Methyl butane	O	---	---	I	---
628 28 4	✔			Methyl butyl ether	O	---	---	I,X	---
623 42 7	✔			Methyl butyrate	O	---	---	I,X	---
74 87 3	✔	✔		Methyl chloride	O	U045	I,T	I,X	---
79 22 1	✔	✔		Methyl chlorocarbonate	O	U156	I,T	I,R,X	EH
71 55 6		✔		Methyl chloroform	O	U226	T	---	---
79 22 1	✔			Methyl chloroformate	O	---	---	I,R,X	EH
107 30 2	✔			Methyl chloromethyl ether	O	---	---	I,X	EH
540 67 0	✔			Methyl ethyl ether	O	---	---	I,X	---
78 93 3	✔	✔		Methyl ethyl ketone (MEK)	O	U159	I,T	I,X	---
1338 23 4	✔	✔		Methyl ethyl ketone peroxide	O	U160	R,T	I,X	---
		✔		Methyl ethyl ketone, spent solvent	O	F005	---	---	---
107 31 3	✔			Methyl formate	O	---	---	I,X	---
60 34 4	✔	✔		Methyl hydrazine	O	P068	T	I,X	AH,EH
74 88 4		✔		Methyl iodide	O	U138	T	---	---
108 10 1		✔		Methyl isobutyl ketone	O	U161	I	---	---
		✔		Methyl isobutyl ketone, spent solvent	O	F003	---	---	---
624 83 9	✔	✔		Methyl isocyanate	O	P064	T	I,X	AH,EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
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Acutely Hazardous	AH	
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814 78 8	✔			Methyl isopropenyl ketone	O	---	---	I,X	---
74 93 1	✔			Methyl mercaptan	O	---	---	I,X	---
80 62 6	✔	✔		Methyl methacrylate (monomer)	O	U162	I,T	I,X	---
298 00 0	✔	✔		Methyl parathion	O	P071	T	X	AH,EH
624 24 8	✔			Methyl pentanoate	O	---	---	I	---
554 12 1	✔			Methyl propionate	O	---	---	I	---
107 87 9	✔			Methyl propyl ketone	O	---	---	I,X	---
77 78 4	✔	✔		Methyl sulfate	O	U103	T	X	EH
75 18 3	✔			Methyl sulfide	O	---	---	I,R,X	EH
624 24 8	✔			Methyl valerate	O	---	---	I	---
78 94 4	✔			Methyl vinyl ketone	O	---	---	I,X	---
60 11 7	✔			Methyl yellow	O	---	---	X	EH
78 79 5	✔		2-	Methyl-1,3-butadiene	O	---	---	I,R,X	---
606 20 2		✔	2-	Methyl-1,3-dinitro-benzene	O	U106	T	---	---
563 46 2	✔		2-	Methyl-1-butene	O	---	---	I	---
563 45 1	✔		3-	Methyl-1-butene	O	---	---	I	---
80 15 9		✔	1-	Methyl-1-phenylethyl-	O	U096	R	---	---
121 14 2		✔	1-	Methyl-2,4-dinitro-benzene	O	U105	T	---	---
108 10 1		✔	4-	Methyl-2-pentanone	O	U161	I	---	---
54 11 5		✔	3-	Methyl-2-pyrrolidinyl-pyridine,(S)-, and salts	O	P075	T	---	AH
	✔		3-	Methyl-3-butene-2-one	O	---	---	I,X	---
99 55 8		✔	2-	Methyl-5-nitro-benzenamine	O	U181	T	---	---
95 53 4		✔	2-	Methyl-benzenamine	O	U328	T	---	---
106 49 0		✔	4-	Methyl-benzenamine	O	U353	T	---	---
636 21 5		✔	2-	Methyl-benzenamine hydrochloride	O	U222	T	---	---
108 88 3	✔	✔		Methyl-benzene	O	U220	I,T	I,X	---
124 40 3		✔	n-	Methyl-methanamine	O	U092	I	---	---
70 25 7		✔	n-	Methyl-n'-nitro-n-nitroso-	O	U163	T	---	---
62 75 9		✔	n-	Methyl-n-nitroso-methanamine	O	P082	T	---	AH
108 10 1		✔	4-	Methyl-pentanol	O	U161	T	---	---
126 98 7		✔	2-	Methyl-propenenitrile	O	U152	I,T	---	---
109 06 8		✔	2-	Methyl-pyridine	O	U191	T	---	---
12263 85 3	✔			Methylaluminum sesquibromide	O	---	---	I,R	EH
12542 85 7	✔			Methylaluminum sesquichloride	O	---	---	I,R	EH
74 89 5	✔			Methylamine	O	---	---	I,X	---
100 61 8	✔		n-	Methylaniline	O	---	---	X	---
75 55 8	✔	✔	2-	Methylaziridine	O	P067	T	I,X	AH,EH

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504 60 9		✔	1-	Methylbutadiene	O	U186	I	---	---
56 49 5		✔	3-	Methylcholanthrene	O	U157	T	---	---
108 87 2	✔			Methylcyclohexane	O	---	---	I,X	---
593 89 5	✔			Methyldichloroarsine	O	---	---	X	EH
75 54 7	✔			Methyldichlorosilane	O	---	---	I,R,X	EH
101 14 4	✔	✔	4,4-	Methylene bis(2-chloroaniline)	O	U158	T	X	EH
74 95 3		✔		Methylene bromide	O	U068	T	---	---
75 09 2	✔	✔		Methylene chloride	O	U080	T	X	---
		✔		Methylene chloride, degreasing solvent	O	F001	---	---	---
		✔		Methylene chloride, spent solvent	O	F002	---	---	---
101 14 4		✔	4,4-	Methylenebis[2-chloro]-benzenamine	O	U158	T	---	---
70 30 4		✔	2,2-	Methylenebis[3,4,6-trichloro-phenol	O	U132	T	---	---
98 82 8		✔	1-	Methylethyl benzene	O	U055	I	---	---
71 36 3		✔		Methylethyl ketone	O	U031	I,T	---	---
75 86 5		✔	2-	Methyllactonitrile	O	P069	T	---	AH
75 16 1	✔			Methylmagnesium bromide	O	---	---	I,C,R	EH
676 58 4	✔			Methylmagnesium chloride	O	---	---	I,C,R	EH
917 64 6	✔			Methylmagnesium iodide	O	---	---	I,C,R	EH
615 53 2		✔		Methylnitroso-carbamic acid, ethyl ester	O	U178	T	---	---
1319 77 3		✔		Methylphenol	O	U052	T	---	---
		✔	2-	Methylpropyl-4,6-dinitro-phenol	O	P020	T	---	AH
56 04 2		✔		Methylthiouracil	O	U164	T	---	---
75 79 6	✔			Methyltrichlorosilane	O	---	---	I,C,R,X	EH
7786 34 7	✔			Mevinphos	O	---	---	X	EH
315 18 4		✔		Mexacarbate	O	P199	T	X	AH, EH
	✔			Mine tailings	O	---	---	R,X	---
311 45 5	✔			Mintacol	O	---	---	X	EH
2385 85 5	✔			Mirex	O	---	---	X	EH
50 07 7		✔		Mitomycin C	O	U010	T	---	---
60 34 4	✔	✔		MMH	O	P068	T	I,X	AH,EH
101 14 4	✔	✔		MOCA	O	U158	T	X	EH
13194 48 4	✔			Mocap	O	---	---	X	EH
2212 67 1		✔		Molinate	O	U365	T	---	---
	✔			Molybdenum (powder)	I	---	---	I	---
11098 99 0	✔			Molybdenum anhydride	I	---	---	X	---
1313 27 5	✔			Molybdenum trioxide	I	---	---	X	---
	✔			Molybdic acid and salts	I	---	---	X	---

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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
79 11 8	✔			Monochloroacetic acid	O	---	---	C,X	---
78 95 5	✔			Monochloroacetone	O	---	---	X	---
13537 32 1	✔			Monofluorophosphoric acid	I	---	---	C,X	---
60 34 4	✔	✔		Monomethyl hydrazine	O	P068	T	I,X	AH,EH
7647 01 0	✔			Muriatic acid	I	---	---	C,R,X	EH
2763 96 4		✔		Muscimol	O	P007	T	---	AH
134 32 7	✔	✔	1-	NA	O	U167	T	X	EH
91 59 8	✔	✔	2-	NA	O	U168	T	X	EH
	✔			Nack	I	---	---	I,C,R	EH
12610 38 7	✔			NaK	I	---	---	I,C,R	EH
	✔			Naphtha (of petroleum or coal tar origin)	O	---	---	I,X	---
20830 81 3		✔	5,12-	Naphthacenedione, 8- acetyl-10-[(3-amino-2,3,6-trideoxy)-alpha-L-lyxo-	O	U059	T	---	---
134 32 7		✔	1-	Naphthalenamine	O	U167	T	---	---
91 59 8		✔	2-	Naphthalenamine	O	U168	T	---	---
494 03 1		✔		Naphthalenamine, n,n-bis(2-chloroethyl)-	O	U026	T	---	---
91 20 30	✔	✔		Naphthalene	O	U165	T	X	---
91 58 7		✔		Naphthalene, 2-chloro-	O	U047	T	---	---
130 15 4		✔	1,4-	Naphthalenedione	O	U166	T	---	---
72 57 1		✔	2,7-	Naphthalenedisulfonic acid, 3,3-[(3,3-dimethyl[1,1-biphenyl]-4,4-diyl)bis(azo) bis[5-amino-4-hydroxy]-	O	U236	T	---	---
86 88 4		✔	1-	Naphthalenyl thiourea	O	P072	T	---	AH
130 15 4		✔	1,4-	Naphthoquinone	O	U166	T	---	---
134 32 7	✔	✔	a-	Naphthylamine	O	U167	T	X	EH
91 59 8	✔	✔	b-	Naphthylamine	O	U168	T	X	EH
86 88 4		✔	a-	Naphthylthiourea	O	P072	T	---	AH
	✔			Naphtite	O	---	---	I,R	---
	✔		4-	NBP	O	---	---	X	EH
96 16 8	✔	✔		Nemagon	O	U066	T	X	EH
75 83 2	✔			Neohexane	O	---	---	I,X	---
	✔			NIA 10,242	O	---	---	X	EH
563 12 2	✔			Nialate	O	---	---	X	EH
13463 39 3	✔			Nickel (powder)	I	---	---	I,X	---
373 02 4	✔			Nickel acetate	O	---	---	X	---
53027 08 0	✔			Nickel antimonide	I	---	---	X	---
	✔			Nickel arsenate	I	---	---	X	EH
13463 39 3	✔	✔		Nickel carbonyl	I	P073	T	X	AH,EH
7718 54 9	✔			Nickel chloride	I	---	---	X	---
557 19 7	✔	✔		Nickel cyanide	I	P074	T	X	AH,EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
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13138 45 9	✔			Nickel nitrate	I	---	---	I,R,X	---
1314 05 2	✔			Nickel selenide	I	---	---	X	---
7786 81 4	✔			Nickel sulfate	I	---	---	X	---
13463 39 3	✔	✔		Nickel tetracarbonyl	I	P073	T	X	AH,EH
	✔			Nickelous arsenate	I	---	---	X	EH
7718 54 9	✔			Nickelous chloride	I	---	---	X	---
13138 45 9	✔			Nickelous nitrate	I	---	---	I,R,X	---
	✔	✔		Nicotine and salts	O	P075	T	X	AH
	✔	✔	m-	Nitraniline	O	P077	T	I,R	AH
	✔	✔		Nitraniline	O	P077	T	I,R	AH
	✔	✔	o-	Nitraniline	O	P077	T	I,R	AH
100 01 6	✔	✔	p-	Nitraniline	O	P077	T	I,R	AH
7697 37 2	✔			Nitric acid	I	---	---	I,C,X	---
10102 45 1		✔		Nitric acid, thallium(1 +) salt	I	U217	T	---	---
10102 43 9		✔		Nitric oxide	I	P076	T	---	AH
	✔			Nitro carbo nitrate	I	---	---	I,R	---
99 55 8		✔	5-	Nitro-o-toluidine	O	U181	T	---	---
29757 24 2	✔	✔		Nitroaniline	O	P077	T	I,R	AH
100 01 6		✔	4-	Nitrobenzenamine	O	P077	T	---	AH
98 95 3	✔	✔		Nitrobenzene	O	U169	I,T	---	---
98 95 3	✔			Nitrobenzol	O	---	---	X	EH
92 93 3	✔		4-	Nitrobiphenyl	O	---	---	X	EH
15491 25 5	✔			Nitrocalcite	I	---	---	I,R	---
9004 70 0	✔			Nitrocellulose	O	---	---	I,R	---
	✔			Nitrochlorobenzene	O	---	---	X	---
10102 44 0	✔	✔		Nitrogen dioxide	I	P078	T	I,X	AH
302 70 5	✔			Nitrogen mustard	O	---	---	C,X	---
11104 93 1		✔		Nitrogen oxide	I	P078	T	---	AH
10544 72 6	✔			Nitrogen tetroxide	I	---	---	I,X	---
55 63 0	✔	✔		Nitroglycerin	O	P081	R	I,R,X	AH
8007 56 5	✔			Nitrohydrochloric acid	I	---	---	I,C,X	---
15825 70 4	✔			Nitromannite	O	---	---	R	---
100 02 7		✔	4-	Nitrophenol	O	U170	T	---	---
88 75 5	✔		o-	Nitrophenol	O	---	---	X	EH
100 02 7		✔	p-	Nitrophenol	O	U170	T	---	---
25154 55 6	✔			Nitrophenol	O	---	---	X	EH
554 84 7	✔		m-	Nitrophenol	O	---	---	X	EH

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	✔		q-	Nitrophenol	O	---	---	X	EH
79 46 9		✔	2-	Nitropropane	O	U171	I,T	---	---
759 73 9		✔	n-	Nitroso-n-ethylurea	O	U176	T	---	---
684 93 5		✔	n-	Nitroso-n-methylurea	O	U177	T	---	---
615 53 2		✔	n-	Nitroso-n-methylurethane	O	U178	T	---	---
621 64 7		✔	n-	Nitroso-n-propylamine	O	U111	T	---	---
924 16 3		✔	n-	Nitrosodi-n-butylamine	O	U172	T	---	---
1116 54 7		✔	n-	Nitrosodiethanolamine	O	U173	T	---	---
55 18 5		✔	n-	Nitrosodiethylamine	O	U174	T	---	---
62 75 9	✔	✔	n-	Nitrosodimethylamine	O	P082	T	X	AH,EH
70 25 7	✔			Nitrosoguanidine	O	---	---	R	---
1116 54 7		✔	2,2-	Nitrosoimino bis-ethanol	O	U173	T	---	---
4549 40 0		✔	n-	Nitrosomethylvinylamine	O	P084	T	---	AH
100 75 4		✔	n-	Nitrosopiperidine	O	U179	T	---	---
930 55 2		✔	n-	Nitrosopyrrolidine	O	U180	T	---	---
9056 38 6	✔			Nitrostarch	O	---	---	I,R	---
	✔			Nitroxylene	O	---	---	X	---
	✔			Nitroxylol	O	---	---	X	---
124 11 8	✔		1-	Nonene	O	---	---	I,X	---
	✔		1-	Nonylene	O	---	---	I,X	---
	✔			Nonytrichlorosilane	O	---	---	I,R	EH
	✔			Obsolete explosives	I/O	---	---	R	---
	✔			OCMB	O	---	---	X	EH
	✔			Octachlorohexahydromethanoisobenzofuran	O	---	---	X	EH
112 04 9	✔			Octadecyltrichlorosilane	O	---	---	I,R	EH
		✔		Octamethyl-diphosphoramide	O	P085	T	---	AH
152 16 9	✔	✔		Octamethylpyrophosphoramide	O	P085	T	X	AH, EH
	✔		n-	Octane (and isomers)	O	---	---	I,X	---
111 66 0	✔		1-	Octene	O	---	---	I,X	---
19102 74 0	✔			Octyl peroxide	O	---	---	I	---
5283 66 9	✔			Octyltrichlorosilane	O	---	---	I,R	EH
	✔			Oil and water	O	---	---	X	---
	✔			Oil ash	O	---	---	C,X	---
7664 93 9	✔			Oil of vitriol	I	---	---	C,X	---
8014 95 7	✔			Oleum	I	---	---	C,R,X	EH
152 16 9	✔			OMPA	O	---	---	X	EH
	✔			Orthozenol	O	---	---	X	EH

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	✔			Osmium compounds	I/O	---	---	X	---
20816 12 0		✔		Osmium oxide	I	P087	T	---	AH
20816 12 0		✔		Osmium tetroxide	I	P087	T	---	AH
145 73 3		✔	7-	Oxabicyclo[2.2.1]heptane-2,3-dicarboxylic acid	O	P088	T	---	AH
144 62 7	✔			Oxalic acid	O	---	---	X	---
23135 22 0		✔		Oxamyl	O	P194	T		AH
75 21 8		✔	1,2-	Oxathiolane, 2,2-dioxide	O	U115	T	---	---
		✔		Oxazaphosphorin amine bis(chloroethyl)tetrahydro oxide	O	P088	T	---	AH
1120 71 4		✔		Oxirane	O	U193	I,T	---	---
50 18 0		✔		Oxirane, chloromethyl-	O	U058	T	---	---
765 34 4		✔		Oxiranecarboxyaldehyde	O	U126	T	---	---
	✔		p-	Oxon	O	---	---	X	EH
542 38 2		✔		Oxybis chloromethane	O	P016	T	---	AH
60 29 7		✔	1,1'-	Oxybis[1]-ethane	O	U117	T	---	---
111 44 4		✔	1,1'-	Oxybis[2]-chloroethane	O	U025	T	---	---
108 60 1		✔	2,2-	Oxybis[2]-chloropropane	O	U027	T	---	---
7783 41 7	✔			Oxygen difluoride	I	---	---	C,R,X	EH
	✔			Paint (or varnish) remover or stripper	O	---	---	I	---
	✔			Paint thinner	O	---	---	I,X	---
	✔			Paint waste (or slops)	O	---	---	I,X	---
123 63 7		✔		Paraldehyde	O	U182	T	---	---
56 38 2	✔	✔		Parathion	O	P089	T	X	AH,EH
12002 03 8	✔			Paris green	O	---	---	X	EH
1336 36 3	✔			PCB	O	---	---	X	EH
82 68 2		✔		PCNB	O	U185	T	---	---
77 10 1	✔	✔		PCP	O	F027	---	X	---
1114 71 2		✔		Pebulate	O	U391	T	---	---
	✔			Pensal	I	---	---	X	EH
19624 22 7	✔			Pentaborane	O	---	---	I,R,X	EH
608 93 5		✔		Pentachlorobenzene	O	U183	T	---	---
76 01 7		✔		Pentachloroethane	O	U184	T	---	---
82 68 8		✔		Pentachloronitrobenzene	O	U185	T	---	---
87 86 5	✔	✔		Pentachlorophenol	O	F027	---	X	---
504 60 9		✔	1,3-	Pentadiene	O	U186	I	---	---
	✔			Pentaerythrite tetranitrate	O	---	---	R	---
120 54 7		✔	bis-	Pentamethylene-thiuram tetrasulfide	O	U400	T	---	---
110 62 3	✔		n-	Pentanal	O	---	---	I,X	---

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	✔		n-	Pentane (and isomers)	O	---	---	I,X	---
110 66 7	✔		1-	Pentanethiol	O	---	---	I,X	---
108 10 1		✔		Pentanol, 4-methyl-	O	U161	T	---	---
107 87 9	✔		2-	Pentanone	O	---	---	I,X	---
109 67 1	✔		1-	Pentene	O	---	---	I,X	---
463 04 7	✔		n-	Pentyl nitrite	O	---	---	I,X	---
79 21 0	✔			Peracetic acid	O	---	---	I,C,R,X	---
7601 90.3	✔			Perchloric acid	O	---	---	I,C,R,X	---
127 18 4	✔			Perchloroethylene	O	---	---	X	---
		✔		Perchloroethylene, spent solvent	O	F002	---	---	---
594 42 3	✔			Perchloromethyl mercaptan	O	---	---	X	EH
7616 94 6	✔			Perchloryl fluoride	O	---	---	I,C,X	---
79 21 0	✔			Peroxyacetic acid	O	---	---	I,C,R,X	---
8032 32 4	✔			Petroleum ether	O	---	---	I,X	---
8030 30 6	✔			Petroleum naphtha	O	---	---	I,X	---
	✔			Pextox 14	O	---	---	X	EH
62 44 2		✔		Phenacetin	O	U187	T	---	---
578 94 9	✔			Phenarsazine chloride	O	---	---	X	EH
108 95 2	✔	✔		Phenol	O	U188	T	C,X	---
696 28 6		✔		Phenyl arsonous dichloride	O	P036	T	---	AH
532 27 4	✔			Phenyl chloromethyl ketone	O	---	---	C,R,X	EH
148 82 3		✔	l-	Phenylalanine, 4-[bis(2-chloroethyl)amino]-	O	U150	T	---	---
122 39 4	✔		n-	Phenylaniline	O	---	---	X	---
92 52 4	✔			Phenylbenzene	O	---	---	X	EH
696 28 6	✔			Phenyldichloroarsine	O	---	---	X	EH
25376 45 8	✔			Phenylenediamine	O	---	---	X	---
100 41 4	✔			Phenylethane	O	---	---	I,X	---
98 86 2		✔	1-	Phenylethanone	O	U004	T	---	---
59 88 1	✔			Phenylhydrazine hydrochloride	O	---	---	X	---
62 38 4		✔		Phenylmercury acetate	O	P092	T	---	AH
1322 20 9	✔			Phenylphenol	O	---	---	X	EH
103 85 5		✔		Phenylthiourea	O	P093	T	---	AH
98 13 5	✔			Phenyltrichlorosilane	O	---	---	I,R	EH
298 02 0	✔	✔		Phorate	O	P094	T	X	AH,EH
7786 34 7	✔			Phosdrin	O	---	---	X	EH
947 02 4	✔			Phosfolan	O	---	---	X	EH
75 44 5	✔	✔		Phosgene	I	P095	T	I,R	AH,EH

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13171 21 6	✔			Phosphamidon	O	---	---	X	EH
7803 51 2	✔	✔		Phosphine	I	P096	T	I,X	AH,EH
7664 38 2		✔		Phosphoric acid	O	P041	T	---	AH
1314 56 3	✔			Phosphoric anhydride	I	---	---	I,C	---
10025 87 3	✔			Phosphoric chloride	I	---	---	I,C,R,X	EH
1314 80 3	✔			Phosphoric sulfide	I	---	---	I,C,R,X	EH
25134 38 7		✔		Phosphorodithioic acid, bis(1-methylethyl) ester	O	P043	T	---	AH
298 02 2		✔		Phosphorodithioic acid, o,o-diethyl S-[(ethylthio)methyl] ester	O	P094	T	---	AH
62 44 2		✔		Phosphorodithioic acid, o,o-diethyl S-methyl ester	O	U087	T	---	---
297 97 2		✔		Phosphorodithioic acid, o,o-diethyl S[2-(ethylthio)ethyl] ester	O	P039	T	---	AH
60 51 5		✔		Phosphorodithioic acid, o,o-dimethyl S-[2-(methylamino)-2-oxoethyl] ester	O	P044	T	---	AH
		✔		Phosphorothioic acid, dimethylaminosulfonylphenyl]dimethyl ester	O	P097	T	---	AH
298 00 0		✔		Phosphorothioic acid, o,o,-dimethyl o-(4-nitrophenyl)ester	O	P071	T	---	AH
56 38 2		✔		Phosphorothioic acid, o,o-diethyl o-(4-nitrophenyl) ester	O	P089	T	---	AH
297 97 2		✔		Phosphorothioic acid, o,o-diethyl o-pyrazinyl ester	O	P040	T	---	AH
7789 59 5	✔			Phosphorus oxybromide	I	---	---	C,R,X	EH
10025 87 3	✔			Phosphorus oxychloride	I	---	---	C,R,X	EH
10026 13 8	✔			Phosphorus pentachloride	I	---	---	I,C,R,X	EH
1314 80 3	✔			Phosphorus pentasulfide	I	---	---	I,C,R,X	EH
1314 56 3	✔			Phosphorus pentoxide	I	---	---	I,C	---
1314 85 8	✔			Phosphorus sesquisulfide	I	---	---	I,C,R,X	EH
1314 80 3		✔		Phosphorus sulfide	I	U189	R	---	---
7789 60 8	✔			Phosphorus tribromide	I	---	---	C,R,X	EH
7719 12 2	✔			Phosphorus trichloride	I	---	---	C,R,X	EH
7789 59 5	✔			Phosphoryl bromide	I	---	---	C,R,X	EH
10025 87 3	✔			Phosphoryl chloride	I	---	---	C,R,X	EH
20859 73 8	✔	✔		Phostoxin	I	P006	R,T	I,R,X	AH,EH
85 44 9		✔		Phthalic anhydride	O	U190	T	---	---
57 47 6		✔		Physostigmine	O	P204	T	---	AH
	✔			Pickling liquor	I	---	---	C	---
109 06 8		✔	2-	Picoline	O	U191	T	---	---
489 98 5	✔			Picramide	O	---	---	I,R	---
88 89 1	✔			Picric acid	O	---	---	I,R	---
124 87 8	✔			Picrotoxin	O	---	---	X	---
88 88	✔			Picryl chloride	O	---	---	I,R	---
	✔			Pigments	I/O	---	---	X	---
		✔		Pink/red water from TNT operations	O	K047	---	---	---

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100 75 4		✔		Piperidine, 1-nitroso-	O	U179	T	---	---
	✔			Plating waste	I	---	---	C,X	---
41575 94 4	✔			Platinum compounds	I/O	---	---	X	EH
78 00 2		✔		Plumbane, tetraethyl-	O	P110	T	---	AH
1336 36 3	✔			Polychlorinated biphenyls (PCBs)	O	---	---	X	EH
8001 35 2	✔	✔		Polychlorocamphene	O	P123	T	X	AH,EH
26355 31 7	✔			Polyvinyl nitrate	O	---	---	I,R	---
299 45 6	✔			Potasan	O	---	---	X	---
57109 90 7	✔			Potassium	I	---	---	I,C,R	EH
7789 29 9	✔			Potassium acid fluoride	I	---	---	C,X	EH
127 95 7	✔			Potassium acid oxalate	O	---	---	X	---
76080 77 8	✔			Potassium arsenate	I	---	---	X	EH
10124 50 2	✔			Potassium arsenite	I	---	---	X	EH
7778 50 9	✔			Potassium bichromate	I	---	---	I,C,X	---
7789 29 9	✔			Potassium bifluoride	I	---	---	C,X	EH
127 95 7	✔			Potassium binoxalate	O	---	---	X	---
7758 01 2	✔			Potassium bromate	I	---	---	I,X	---
151 50 8	✔	✔		Potassium cyanide	I	P098	T	X	AH,EH
2244 21 5	✔			Potassium dichloroisocyanurate	I	---	---	I,X	---
7778 50 9	✔			Potassium dichromate	I	---	---	I,C,X	---
128 03 0		✔		Potassium dimethyldithiocarbamate	O	U383	T	---	---
7789 23 3	✔			Potassium fluoride	I	---	---	X	---
7693 26 7	✔			Potassium hydride	I	---	---	I,C,R	EH
1310 58 3	✔			Potassium hydroxide	I	---	---	C,X	---
51026 28 9		✔		Potassium hyroxymethyl-n-methyldi-thiocarbamate	O	U378	T	---	---
137 41 7		✔		Potassium n-methyldithiocarbamate	O	U377	T	---	---
7757 79 1	✔			Potassium nitrate	I	---	---	I,R	---
7758 09 0	✔			Potassium nitrite	I	---	---	I,R	---
583 52 8	✔			Potassium oxalate	O	---	---	X	---
7778 74 7	✔			Potassium perchlorate	I	---	---	I,R,X	---
7722 64 7	✔			Potassium permanganate	I	---	---	I,C,X	---
17014 71 0	✔			Potassium peroxide	I	---	---	I,C,R	---
506 61 6		✔		Potassium silver cyanide	I	P099	T	---	AH
1312 73 8	✔			Potassium sulfide	I	---	---	I,X	---
	✔			Printing ink	O	---	---	X	---
2631 37 0		✔		Promecarb	O	P201	T	---	AH
23950 58 5		✔		Pronamide	O	U192	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
123 38 6	✔	✔		Propanal	O	P070	T	I,X	AH
107 10 8		✔	1-	Propanamine	O	U194	I,T	---	---
621 64 7		✔	1-	Propanamine, n-nitroso-n-propyl-	O	U111	T	---	---
142 84 7		✔	1-	Propanamine, n-propyl-	O	U110	I	---	---
1120 71 4		✔	1, 3-	Propane sulfone	O	U193	T	---	---
96 12 8		✔		Propane, 1,2-dibromo-3-chloro-	O	U066	T	---	---
78 87 5		✔		Propane, 1,2-dichloro-	O	U083	T	---	---
108 60 1		✔		Propane, 2,2'-oxybis[2]-chloro-	O	U027	T	---	---
79 46 9		✔		Propane, 2-nitro-	O	U171	I,T	---	---
109 77 3		✔		Propanedinitrile	O	U149	T	---	---
107 12 0		✔		Propanenitrile	O	P101	T	---	AH
75 86 5		✔		Propanenitrile, 2-hydroxy-2-methyl-	O	P069	T	---	AH
542 76 7		✔		Propanenitrile, 3-chloro-	O	P027	T	---	AH
107 03 9	✔		1-	Propanethiol	O	---	---	I,X	---
75 33 2	✔		2-	Propanethiol	O	---	---	I,X	---
55 63 0		✔	1,2,3-	Propanetriol, trinitrate	O	P081	R	---	AH
79 09 4	✔			Propanoic acid	O	---	---	I,C,X	---
93 72 1		✔		Propanoic acid, 2-(2,4,5-trichlorophenoxy)-	O	F027	---	---	---
71 23 8	✔		1-	Propanol	O	---	---	I,X	---
67 63 0	✔		2-	Propanol	O	---	---	I,X	---
126 72 7		✔		Propanol, 2,3-dibromo-, phosphate (3:1)	O	U235	T	---	---
67 64 1	✔	✔	2-	Propanone	O	U002	I	I	---
67 64 1	✔	✔		Propanone	O	U002	I	I	---
598 31 2		✔	2-	Propanone, 1-bromo-	O	P017	T	---	AH
107 19 7		✔		Propargyl alcohol	O	P102	T	---	AH
106 96 7	✔			Propargyl bromide	O	---	---	I,X	EH
107 18 6	✔	✔	2-	Propen-1-ol	O	P005	T	I,X	AH
107 02 8		✔	2-	Propenal	O	P003	T	---	AH
79 06 1		✔	2-	Propenamide	O	U007	T	---	---
107 13 1		✔	2-	Propenenitrile	O	U009	T	---	---
79 10 7		✔	2-	Propenoic acid	O	U008	I	---	---
140 88 5		✔	2-	Propenoic acid, ethyl ester	O	U113	I	---	---
120 58 1		✔	5-(1-	Propenyl)-1,3-benzodioxole	O	U141	T	---	---
94 59 7		✔	5-(2-	Propenyl)-1,3-benzodioxole	O	U203	T	---	---
122 42 9		✔		Propham	O	U373	T	---	---
57 57 8	✔		b-	Propiolactone	O	---	---	X	EH
123 38 6	✔			Propionaldehyde	O	---	---	I,X	---

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Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
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3771 19 5	✔			Propionic acid	O	---	---	I,C,X	---
107 12 0		✔		Propionitrile	O	P027	T	---	AH
114 26 1		✔		Propoxur	O	U411	T	---	---
109 60 4	✔		n-	Propyl acetate	O	---	---	I,X	---
71 23 8	✔		n-	Propyl alcohol	O	---	---	I,X	---
110 74 7	✔		n-	Propyl formate	O	---	---	I,X	---
107 03 9	✔		n-	Propyl mercaptan	O	---	---	I,X	---
94 58 6		✔	5-	Propyl-1,3-benzodioxole	O	U090	T	---	---
107 10 9	✔	✔	n-	Propylamine (and isomers)	O	U194	I,T	I,X	---
78 87 5		✔		Propylene dichloride	O	U083	T	---	---
75 56 9	✔			Propylene oxide	O	---	---	I,X	---
	✔	✔	1,2-	Propyleneimine	O	P067	T	I,X	AH,EH
621 64 7		✔	di-n-	Propylnitrosamine	O	U111	T	---	---
141 57 1	✔		n-	Propyltrichlorosilane	O	---	---	I,C,R,X	EH
107 19 7		✔	2-	Propyn-1-ol	O	P102	T	---	AH
52888 80 9		✔		Prosulfocarb	O	U387	T	---	---
2275 18 5	✔			Prothoate	O	---	---	X	EH
123 33 1		✔	3,6-	Pyridazinedione, 1,2-dihydro-	O	U148	T	---	---
504 24 5		✔	4-	Pyridinamine	O	P008	T	---	AH
110 86 1	✔	✔		Pyridine	O	U196	T	I,X	---
		✔		Pyridine, spent solvent	O	F005	---	---	---
66 75 1		✔	2,4-(1H,3H)-	Pyrimidinedione, S-[bis(2-chloroethyl)amino] -	O	U237	T	---	---
56 04 2		✔	4(1H)-	Pyrimidinone, 2,3-dihydro-6-methyl-2-thioxo-	O	U164	T	---	---
7791 27 7	✔			Pyrosulfuryl chloride	I	---	---	C,R,X	EH
930 55 2		✔		Pyrrolidine, 1-nitroso-	O	U180	T	---	---
106 51 4	✔			Quinone	O	---	---	X	EH
5836 29 3	✔			Racumin 57	O	---	---	X	EH
7440 02 0	✔			Raney nickel	I	---	---	I	---
81 81 2	✔			Ratox	I	---	---	X	EH
50 55 5		✔		Reserpine	O	U200	T	---	---
108 46 3		✔		Resorcinol	O	U201	T	---	---
	✔			Retrograde explosives	I/O	---	---	R	---
81 07 2		✔		Saccharin, and salts	I/O	U202	T	---	---
94 59 7		✔		Safrole	O	U203	T	---	---
	✔			Salicylated mercury	O	---	---	X	---
7757 79 1	✔			Saltpeter	I	---	---	I,R	---
152 16 9	✔			Schradan	O	---	---	X	EH

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7783 00 8	✔	✔		Selenious acid	I	U204	T	X	EH
12039 52 0	✔	✔		Selenious acid dithallium(1+) salt	I	P114	T	X	AH,EH
	✔			Selenious acid salts (except dithallium(1+) salt)	I	---	---	X	EH
7782 49 2	✔	✔		Selenium	O	U376	T	X	EH
	✔			Selenium compounds	I/O	---	---	X	EH
7446 08 4		✔		Selenium dioxide	I	U204	T		EH
127386 55 4	✔			Selenium fluoride	I	---	---	X	EH
		✔		Selenium sulfide (not SeS2)	I	U205	T		EH
7488 56 4		✔		Selenium sulfide (SeS2)	I	U205	R,T		EH
630 10 4		✔		Selenourea	O	P103	T	X	AH,EH
115 02 6		✔	l-	Serine, diazoacetate (ester)	O	U015	T	---	---
10025 78 2	✔			Silicochloroform	O	---	---	I,C,R,X	EH
10026 04 7	✔			Silicon chloride	I	---	---	C,R,X	EH
10026 04 7	✔			Silicon tetrachloride	I	---	---	C,R,X	EH
13092 75 6	✔			Silver acetylide	O	---	---	I,R	EH
13863 88 2	✔			Silver azide	I	---	---	I,R	---
	✔			Silver compounds	I/O	---	---	X	---
506 64 9		✔		Silver cyanide	I	P104	T	---	AH
7761 88 8	✔			Silver nitrate	I	---	---	X	---
	✔			Silver styphnate	O	---	---	I,R	---
	✔			Silver tetrazine	O	---	---	I,R	---
	✔			Silver trinitroresorcinate	O	---	---	I,R	---
		✔		Silvex	O	F027	---	---	---
534 52 1	✔	✔		Sinox	O	P047	T	X	AH,EH
	✔			Sludge acid	I	---	---	C	---
497 19 8	✔			Soda ash	I	---	---	C	---
7631 99 4	✔			Soda niter	I	---	---	I,R,X	---
7782 92 5	✔			Sodamide	I	---	---	I,C,R	EH
62476 59 9	✔			Sodium	I	---	---	I,C,R	EH
	✔			Sodium acid fluoride	I	---	---	C,X	EH
1302 42 7	✔			Sodium aluminate	I	---	---	C	---
13770 96 2	✔			Sodium aluminum hydride	I	---	---	I,C,R	EH
7782 92 5	✔			Sodium amide	I	---	---	I,C,R	EH
7631 89 2	✔			Sodium arsenate	I	---	---	X	EH
7784 46 5	✔			Sodium arsenite	I	---	---	X	EH
26628 22 8	✔	✔		Sodium azide	I	P105	T	I,R	AH
	✔			Sodium bichromate	I	---	---	I,C,X	---

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1333 83 1	✔			Sodium bifluoride	I	---	---	C,X	EH
7789 38 0	✔			Sodium bromate	I	---	---	I,X	---
124 65 2	✔			Sodium cacodylate	O	---	---	X	EH
15630 89 4	✔			Sodium carbonate peroxide	I	---	---	I	---
7775 09 9	✔			Sodium chlorate	I	---	---	I,X	---
7758 19 2	✔			Sodium chlorite	I	---	---	I,X	---
7775 11 3	✔			Sodium chromate	I	---	---	C,X	---
143 33 9	✔	✔		Sodium cyanide	I	P106	T	X	AH,EH
136 30 1		✔		Sodium dibutyldithiocarbamate	O	U379	T	---	---
2893 78 9	✔			Sodium dichloroisocyanurate	I	---	---	I	---
	✔			Sodium dichromate	I	---	---	I,C,X	---
148 18 5		✔		Sodium diethyldithiocarbamate	O	U381	T	---	---
	✔			Sodium dimethylarsenate	O	---	---	X	EH
128 04 1		✔		Sodium dimethyldithiocarbamate	O	U382	T	---	---
7681 49 4	✔			Sodium fluoride	I	---	---	X	---
7646 69 7	✔			Sodium hydride	I	---	---	I,C,R,X	EH
16721 80 5	✔			Sodium hydrosulfide	I	---	---	I,X	---
7775 14 6	✔			Sodium hydrosulfite	I	---	---	I	---
1310 73 2	✔			Sodium hydroxide	I	---	---	C,X	---
7681 52 9	✔			Sodium hypochlorite	I	---	---	I,R,X	EH
7772 98 7	✔			Sodium hyposulfite	I	---	---	I	---
124 41 4	✔			Sodium methoxide	O	---	---	I,C,R	EH
124 41 4	✔			Sodium methylate	O	---	---	I,C,R	EH
7631 95 0	✔			Sodium molybdate	I	---	---	X	---
12401 86 4	✔			Sodium monoxide	I	---	---	C,X	---
7631 99 4	✔			Sodium nitrate	I	---	---	I,R,X	---
7632 00 0	✔			Sodium nitrite	I	---	---	I,R,X	---
1313 59 3	✔			Sodium oxide	I	---	---	C,X	---
7601 89 0	✔			Sodium perchlorate	I	---	---	I,R,X	---
10101 50 5	✔			Sodium permanganate	I	---	---	I,X	---
1313 60 6	✔			Sodium peroxide	I	---	---	I,R,X	EH
831 52 7	✔			Sodium picramate	O	---	---	I,R,X	---
	✔			Sodium potassium alloy	I	---	---	I,C,R	EH
134 10 01 0	✔			Sodium selenate	I	---	---	X	EH
1313 82 2	✔			Sodium sulfide	I	---	---	I,X	---
540 72 7	✔			Sodium sulfocyanate	I	---	---	X	---
540 72 7	✔			Sodium thiocyanate	I	---	---	X	---

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	✔			Solvents	O	---	---	I	---
	✔			Spent (or waste) cyanide solutions	I	---	---	C,X	---
	✔			Spent acid	I	---	---	C	---
	✔			Spent caustic	I	---	---	C	---
	✔			Spent mixed acid	I	---	---	C	---
	✔			Spent plating solution	I	---	---	C,X	---
7646 78 8	✔			Stannic chloride	I	---	---	C,X	---
18883 66 4		✔		Streptozotocin	O	U206	T	---	---
	✔			Stripping solution	I/O	---	---	I,X	---
	✔			Strontium arsenate	I	---	---	X	EH
1314 18 7	✔			Strontium dioxide	I	---	---	I,R	---
10042 76 9	✔			Strontium nitrate	I	---	---	I,R,X	---
1314 18 7	✔			Strontium peroxide	I	---	---	I,R	---
1314 96 1		✔		Strontium sulfide	I	P107	T	---	AH
357 57 3		✔		Strychnidin-10-one, 2,3 dimethoxy-	O	P018	T	---	AH
57 24 9	✔	✔		Strychnine and salts	O	P108	T	X	AH,EH
82 71 3	✔			Styphnic acid	O	---	---	I,R	---
100 42 5	✔			Styrene	O	---	---	I,X	---
1596 84 5	✔			Succinic acid peroxide	O	---	---	I,X	---
95 06 7		✔		Sulfallate	O	U277	T	---	---
	✔			Sulfide salts (soluble)	I	---	---	X	---
	✔			Sulfonation oil	I	---	---	I	---
7791 25 5	✔			Sulfonyl chloride	I	---	---	C,R,X	EH
2699 79 8	✔			Sulfonyl fluoride	I	---	---	C,R,X	EH
3689 24 5	✔			Sulfotepp	O	---	---	X	EH
10025 67 9	✔			Sulfur chloride	I	---	---	C,R,X	EH
10025 67 9	✔			Sulfur monochloride	I	---	---	C,R,X	EH
505 60 2	✔			Sulfur mustard	O	---	---	C,R,X	EH
7719 09 7	✔			Sulfur oxychloride	I	---	---	C,R,X	EH
10546 01 7	✔			Sulfur pentafluoride	I	---	---	C,X	EH
1314 80 3		✔		Sulfur phosphide	I	U189	R	---	---
7446 11 9	✔			Sulfur trioxide	I	---	---	I,C,X	---
2973 10 6	✔			Sulfuric acid	I	---	---	C,X	---
77 78 1		✔		Sulfuric acid, dimethyl ester	O	U103	T	---	---
7446 18 6		✔		Sulfuric acid, dithallium (1+) salt	I	P115	T	---	AH
7446 11 9	✔			Sulfuric anhydride	I	---	---	I,C,X	---
7782 99 2	✔			Sulfurous acid	I	---	---	C,X	---

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7791 25 5	✔			Sulfuryl chloride	I	---	---	C,R,X	EH
2699 79 8	✔			Sulfuryl fluoride	I	---	---	C,R,X	EH
	✔			Suppracide	O	---	---	X	EH
13067 93 1	✔			Surecide	O	---	---	X	EH
8065 48 3	✔			Systox	O	---	---	X	EH
	✔		2,4,5-	T	O	---	---	X	EH
	✔			Tank bottom sediment	I/O	---	---	X	---
	✔			Tanning sludges	O	---	---	X	---
1746 01 6	✔			TCDD	O	---	---	X	EH
26471 62 5	✔	✔		TDI	O	U223	R,T	I,R	EH
	✔	✔		TEL (and other organic lead)	O	P110	T	I,X	AH,EH
7783 80 4	✔			Tellurium hexafluoride	I	---	---	C,X	EH
297 78 9	✔			Telodrin	O	---	---	X	EH
116 06 3	✔			Temik	O	---	---	X	EH
545 55 1	✔			TEPA	O	---	---	X	EH
107 49 3	✔	✔		TEPP	O	P111	T	X	AH
107 71 1	✔			tert-Butyl peracetate	O	---	---	I,R	---
614 45 9	✔			tert-Butyl perbenzoate	O	---	---	I,R	---
1634 02 2		✔		Tetrabutylthiuram disulfide	O	U402	T	---	---
93 73 2		✔		Tetrabutylthiuram monosulfide	O	U401	T	---	---
94 95 3		✔	1,2,4,5-	Tetrachlorobenzene	O	U207	T	---	---
1746 01 6	✔		2,3,7,8-	Tetrachlorodibenzo-para-dioxin	O	---	---	X	EH
630 20 6		✔	1,1,1,2-	Tetrachloroethane	O	U208	T	---	---
79 34 5	✔		sym-	Tetrachloroethane	O	---	---	X	EH
127 18 4		✔		Tetrachloroethene	O	U210	T	---	---
127 18 4	✔	✔		Tetrachloroethylene	O	U210	T	X	---
		✔		Tetrachloroethylene, spent degreasing solvent	O	F001	---	---	---
		✔		Tetrachloroethylene, spent solvent	O	F002	---	---	---
56 23 5	✔	✔		Tetrachloromethane	O	U211	T	X	---
58 90 2		✔	2,3,4,6-	Tetrachlorophenol	O	F027	---	---	---
107 49 3		✔		Tetraethyl ester diphosphoric acid	O	P111	T	---	AH
78 00 2	✔	✔		Tetraethyl lead	O	P110	T	I,X	AH,EH
107 49 3	✔	✔		Tetraethyl pyrophosphate	O	P111	T	X	AH
	✔		o,o,o',o'-	Tetraethyl-S,S-methylenediphosphorodithioate	O	---	---	X	EH
3689 24 5		✔		Tetraethyldithiopyrophosphate	O	P109	T	X	EH, AH
78 00 2	✔	✔		Tetraethylplumbane	O	P110	T	---	AH
109 99 9	✔	✔		Tetrahydrofuran	O	U213	I	I,X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
	✔			Tetrahydronapthalene	O	---	---	X	---
85 43 8	✔			Tetrahydrophthalic anhydride	O	---	---	X	---
119 64 2	✔			Tetralin	O	---	---	X	---
75 74 1	✔			Tetramethyl lead	O	---	---	I,X	---
3333 52 6	✔			Tetramethyl succinonitrile	O	---	---	X	EH
115 26 4	✔			Tetramethylphosphorodiamidic fluoride	O	---	---	X	EH
	✔		o,o-	Tetramethylthiuram monosulfide	O	---	---	X	EH
509 14 8	✔	✔		Tetranitromethane	O	P112	R	I,R,X	AH,EH
757 58 4		✔		Tetraphosphoric acid, hexaethyl ester	O	P062	T	---	AH
1314 85 8	✔			Tetraphosphorus trisulfide	I	---	---	I,C,R,X	EH
2227 13 6	✔			Tetrasul	O	---	---	X	EH
14097 21 3	✔		1-	Tetrazene	O	---	---	I,R	---
1314 32 5		✔		Thallic oxide	I	P113	T	---	AH
7440 28 0	✔			Thallium	I	---	---	X	EH
7791 12 0		✔		Thallium chloride	I	U216	T	---	---
	✔			Thallium compounds	I/O	---	---	X	EH
1314 12 1		✔		Thallium oxide	I	P113	T	---	AH
7446 18 6	✔			Thallium sulfate	I	---	---	X	EH
10102 45 1		✔		Thallium(1 +) salt, nitric acid	I	U217	T	---	---
563 68 8		✔		Thallium(I) acetate	O	U214	T	---	---
6533 73 9		✔		Thallium(I) carbonate	I	U215	T	---	---
7791 12 0		✔		Thallium(I) chloride	I	U216	T	---	---
10102 45 1		✔		Thallium(I) nitrate	I	U217	T	---	---
12039 52 0		✔		Thallium(I) selenite	I	P114	T	---	AH
7446 18 6		✔		Thallium(I) sulFate	I	P115	T	---	AH
7446 18 6	✔			Thallous sulfate	I	---	---	X	EH
109 99 9	✔	✔		THF	O	U213	I	I,X	---
61 82 5		✔	1H-1,2,4-	Thiazol-3-amine	O	U011	T	---	---
298 02 2	✔	✔		Thimet	O	P094	T	X	AH,EH
62 55 5		✔		Thioacetamide	O	U218	T	---	---
463 71 8	✔			Thiocarbonylchloride	O	---	---	C,R,X	EH
115 29 7	✔	✔		Thiodan	O	P050	T	X	AH,EH
59669 26 0		✔		Thiodicarb	O	U410	T	---	---
		✔		Thiodiphosphoric acid, tetraethyl ester	O	P109	T	---	AH
39196 18 4		✔		Thiofanox	O	P045	T	---	—-
74 93 1		✔		Thiomethanol	O	U153	I,T	---	---
297 97 2	✔			Thionazin	O	---	---	X	EH

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
7719 09 7	✔			Thionyl chloride	I	---	---	C,R,X	EH
137 26 8		✔		Thioperoxydicarbonic diamide [(H2N)C(S)]2S2,tetramethyl-	O	U244	T	---	---
23564 05 8		✔		Thiophanate-methyl	O	U409	T	---	---
108 98 5		✔		Thiophenol	O	P014	T	---	AH
463 71 8	✔			Thiophosgene	O	---	---	C,R,X	EH
3982 91 0	✔			Thiophosphoryl chloride	I	---	---	C,R,X	EH
79 19 6		✔		Thiosemicarbazide	O	P116	T	---	AH
62 56 6		✔		Thiourea	O	U219	T	---	---
137 26 8		✔		Thiram	O	U244	T	---	---
	✔			Thorium (powder)	I	---	---	I	---
	✔			Tin compounds (organic)	O	---	---	X	---
7646 78 8	✔			Tin tetrachloride	I	---	---	C,X	---
26419 73 8		✔		Tirpate	O	P185	T	A	
	✔			Titanic chloride	I	---	---	C,R,X	EH
	✔			Titanium (powder)	I	---	---	I	---
13693 11 3	✔			Titanium sulfate	I	---	---	X	---
7550 45 0	✔			Titanium tetrachloride	I	---	---	C,R,X	EH
51 92 3	✔			TMA	O	---	---	I,X	---
126000 43 9	✔			TML	O	---	---	I,X	---
99 35 4	✔	✔		TNB	O	U234	R,T	I,R	---
	✔	✔		TNT	O	K047	---	I,R,X	---
108 88 3	✔	✔		Toluene	O	U220	I,T	I,X	---
		✔		Toluene, spent solvent	O	F005	---	---	---
26471 62 5	✔	✔		Toluene-2,4-diisocyanate	O	U223	R,T	I,R	EH
		✔		Toluene-2,6-diisocyanate	O	U223	R,T	---	---
25376 45 8		✔		Toluenediamine	O	U221	T	---	---
108 44 1	✔		m-	Toluidine	O	---	---	X	---
95 53 4	✔	✔	o-	Toluidine	O	U328	T	X	---
106 49 0	✔	✔	p-	Toluidine	O	U353	T	X	---
636 21 5		✔	o-	Toluidine hydrochloride	O	U222	T	---	---
8001 35 2	✔	✔		Toxaphene	O	P123	T	X	AH,EH
	✔			Toxic chemical toilet wastes	O	---	---	X	---
93 72 1		✔	2,4,5-	TP	O	F027	---	---	---
15271 41 7	✔			Tranid	O	---	---	X	EH
2303 17 5		✔		Triallate	O	U389	T	---	---
1031 47 6	✔			Triamiphos	O	---	---	X	EH
75 25 2		✔		Tribromomethane	O	U225	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
79 25 2	✔			Trichlorethene	O			X	---
		✔	1,1,1-	Trichloro-1,2,2-trifluoroethane, spent solvent	O	F002	---	---	---
50 29 3	✔	✔	1,1,1-	Trichloro-2,2-bis(chlorophenyl) ethane	O	U061	T	X	---
75 87 6		✔		Trichloroacetaldehyde	O	U034	T	---	---
	✔			Trichloroacetaldehyde (hydrated)	O	---	---	X	---
10294 34 5	✔			Trichloroborane	I	---	---	C,R,X	EH
71 55 6		✔	1,1,1-	Trichloroethane	O	U226	T	---	---
79 00 5	✔	✔	1,1,2-	Trichloroethane	O	U227	T	X	---
		✔	1,1,1-	Trichloroethane, spent degreasing solvent	O	F001	---	---	---
		✔	1,1,1-	Trichloroethane, spent solvent	O	F002	---	---	---
79 01 6	✔	✔		Trichloroethylene	O	U228	T	X	---
		✔		Trichloroethylene, spent degreasing solvent	O	F001	---	---	---
		✔		Trichloroethylene, spent solvent	O	F002	---	---	---
72 43 5		✔	1,1'-2,2,2-	Trichloroethylidene bis[4- methoxy-benzene	O	U247	T	---	---
50 29 3		✔	1,1'-2,2,2-	Trichloroethylidene bis[4-chloro-benzene	O	U061	T	---	---
75 69 4		✔		Trichlorofluoromethane	O	U121	T	---	---
		✔		Trichlorofluoromethane, spent solvent	O	F002	---	---	---
87 90 1	✔			Trichloroisocyanuric acid	O	---	---	I,X	---
67 66 3	✔	✔		Trichloromethane	O	U044	T	X	---
75 70 7		✔		Trichloromethanethiol	O	P118	T	---	AH
98 07 7		✔		Trichloromethylbenzene	O	U023	T	---	---
594 42 3	✔			Trichloromethylsulfenyl chloride	O	---	---	X	EH
75 69 4		✔		Trichloromonofluoromethane	O	U121	T	---	---
76 06 2	✔			Trichloronitromethane	I/O	---	---	X	EH
95 95 4		✔	2,4,5-	Trichlorophenol	O	F027	---	---	---
88 06 2		✔	2,4,6-	Trichlorophenol	O	F027	---	---	---
	✔	✔	2,4,5-	Trichlorophenoxy	O	F027	---	X	EH
		✔	2-(2,4,5	Trichlorophenoxy) propanoic acid	O	F027	---	---	---
10025 78 2	✔			Trichlorosilane	O	---	---	I,C,R,X	EH
121 44 8		✔		Triethylamine	O	U404	T	---	---
545 55 1	✔			Triethylenephosphoramide	O	---	---	X	EH
98 08 8	✔			Trifluoromethylbenzene	O	---	---	I,X	EH
76 01 7		✔	2,4,6-	Trimethyl-1,3,5-trioxane	O	U182	T	---	---
75 50 3	✔			Trimethylamine	O	---	---	I,X	---
540 84 1	✔		2,2,4-	Trimethylpentane	O	---	---	I,X	---
26952 42 1	✔			Trinitroaniline	O	---	---	I,R	---
	✔			Trinitroanisole	O	---	---	I,R	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
Corrosive Waste	C	C
Reactive Waste	R	R
Toxic Waste	T	X
Acutely Hazardous	AH	
Extremely Hazardous		EH

Sources: **US RCRA Federal listed wastes: 40 CFR 261.31 - 262.33, July 1994**
California State listed wastes: CCR Title 22, §66261.126 Appendix X, May 1991
Chemical Abstract Service, American Chemical Society, 1996

CAS #	Calif. listed	RCRA Listed	CHEMICAL NAME		Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
99 35 4	✔	✔	1,3,5-	Trinitrobenzene	O	U234	R,T	I,R	---
129 66 8	✔		2,4,6-	Trinitrobenzoic acid	O	---	---	I,R	---
55 63 0	✔	✔		Trinitroglycerin	O	P081	R	I,R,X	AH
	✔			Trinitronaphthalene	O	---	---	I,R	---
88 89 1	✔			Trinitrophenol	O	---	---	I,R	---
		✔	2,4,6-	Trinitrophenol, ammonium salt	O	P009	R	---	AH
	✔		2,4,6-	Trinitrophenyl methyl ether	O	---	---	I,R	---
82 71 3	✔		2,4,6-	Trinitroresorcinol	O	---	---	I,R	---
118 96 7	✔		2,4,6-	Trinitrotoluene	O	---	---	I,R,X	---
123 63 7		✔	1, 3, 5-	Trioxane, 2,4,6-trimethyl-	O	U182	T	---	---
126 72 7		✔		Tris(2,3-dibromopropyl) phosphate	O	U235	T	---	---
786 19 6	✔			Trithion	O	---	---	X	EH
72 57 1		✔		Trypan blue	O	U236	T	---	---
	✔			Tungstic acid and salts	I/O	---	---	X	---
9005 90 7	✔			Turpentine	O	---	---	I,X	---
57 14 7	✔	✔		UDMH	O	U098	T	I,X	EH
	✔			Ultracide	O	---	---	X	EH
	✔			Unrinsed pesticide containers	O/I	---	---	X	---
	✔			Unwanted waste pesticides - active ingredient or undiluted formulation	O/I	---	---	X	---
66 75 1		✔		Uracil mustard	O	U237	T	---	---
15905 86 9	✔			Uranium nitrate	I	---	---	I,R,X	---
10102 06 4	✔			Uranyl nitrate	I	---	---	I,R,X	---
124 47 0	✔			Urea nitrate	I	---	---	I,R,X	---
51 79 6		✔		Urethane	O	U238	T	---	---
110 62 3	✔		n-	Valeraldehyde	O	---	---	I,X	---
1314 62 1	✔	✔		Vanadic acid anhydride	I	P120	T	X	AH,EH
	✔	✔		Vanadic acid salts	I	P119	T	X	AH
7727 18 6	✔			Vanadium oxytrichloride	I	---	---	C,X	---
1314 62 1	✔	✔		Vanadium pentoxide	I	P120	T	X	AH,EH
1314 34 7	✔			Vanadium sesquioxide	I	---	---	X	---
16785 81 2	✔			Vanadium sulfate	I	---	---	X	---
7632 51 1	✔			Vanadium tetrachloride	I	---	---	C,X	---
	✔			Vanadium tetraoxide	I	---	---	X	---
1314 34 7	✔			Vanadium trioxide	I	---	---	X	---
	✔			Vanadyl sulfate	I	---	---	X	---
62 73 7	✔			Vapona	O	---	---	X	EH
1929 77 7		✔		Vernolate	O	U385	T	---	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

CHARACTERISTICS:	FEDERAL	STATE
Ignitable Waste	I	I
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Reactive Waste	R	R
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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
108 05 4	✔			Vinyl acetate	O	---	---	I,X	---
75 01 4	✔	✔		Vinyl chloride	O	U043	T	I,X	EH
109 92 2	✔			Vinyl ethyl ether	O	---	---	I	---
926 65 8	✔			Vinyl isopropyl ether	O	---	---	I	---
593 67 9		✔		Vinylamine	O	P084	T	---	AH
100 42 5	✔			Vinylbenzene	O	---	---	I,X	---
75 35 4	✔			Vinylidene chloride	O	---	---	I,X	---
75 94 5	✔			Vinyltrichlorosilane	O	---	---	I,C,R,X	EH
81 81 2		✔		Warfarin, and salts, at concentrations of =<0.3%	O	U248	T	---	---
		✔		Warfarin, and salts, at concentrations of >0.3%	O	P001	T	---	AH
	✔			Waste (or slop) oil	O	---	---	X	---
	✔			Waste epoxides	O	---	---	I,X	---
		✔		Wastewater treatment sludges from explosives manufacturing and processiong	O	K044	T	---	---
	✔			Weed Killer	O	---	---	X	---
1031 47 6	✔			Wepsyn 155	O	---	---	X	EH
12185 10 3	✔			White phosphorus	I	---	---	I,R,X	EH
1031 47 6	✔			WP 155	O	---	---	X	EH
1330 20 7	✔	✔		Xylene	O	U239	I	I,X	---
		✔		Xylene, spent solvent	O	F003	---	---	---
12185 10 3	✔			Yellow phosphorus	I	---	---	I,R,X	EH
50 55 5		✔		Yohimban-16-carboxylic acid, etc..	O	U200	T	---	---
	✔			Zectram	O	---	---	X	EH
	✔			Zinc (powder)	I	---	---	I	---
	✔			Zinc ammonium nitrate	I	---	---	I,X	---
13464 33 0	✔			Zinc arsenate	I	---	---	X	EH
	✔			Zinc arsenite	I	---	---	X	EH
7646 85 7	✔			Zinc chloride	I	---	---	C,X	---
	✔			Zinc compounds	I/O	---	---	X	---
557 21 1	✔	✔		Zinc cyanide	I	P121	T	X	AH,EH
1314 22 3	✔			Zinc dioxide	I	---	---	I,R,X	---
141677 20 5	✔			Zinc ethyl	O	---	---	I,C,R	EH
7779 88 6	✔			Zinc nitrate	I	---	---	I,R,X	---
23414 72 4	✔			Zinc permanganate	I	---	---	I,X	---
1314 22 3	✔			Zinc peroxide	I	---	---	I,R,X	---
1314 84 7	✔	✔		Zinc phosphide, Zn3P2, at concentrations of =<10%	I	U249	T	I,R,X	EH
1314 84 7	✔	✔		Zinc phosphide, Zn3P2,at concentrations of >10%	I	P122	R,T	I,R,X	AH,EH
7733 02 0	✔			Zinc sulfate	I	---	---	X	---

LIST OF CHEMICAL AND COMMON NAMES FOR HAZARDOUS WASTE

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Ignitable Waste	I	I
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CAS #	Calif. listed	RCRA Listed		CHEMICAL NAME	Org./ Inorg.	EPA Code	Federal Hazard	State Hazard	Subset Wastes
297 97 2	✔			Zinophos	O	---	---	X	EH
137 30 4		✔		Ziram	O	P205	T	---	AH
	✔			Zirconium (powder)	I	---	---	I	---
10026 11 6	✔			Zirconium chloride	I	---	---	C,R,X	EH
	✔			Zirconium picramate	O	---	---	I	---
10026 11 6	✔			Zirconium tetrachloride	I	---	---	C,R,X	EH

Appendix B

Appendix B

Guidance for Completion of the Waste Disposal Requisition (WDR) Form

- **Waste Disposal Requisition Instructions**
- **List of Reference Codes**
- **Source Code Information for Item 17 of the WDR Form**
- **Wastestream Description for Item 27 of the WDR Form**
- **Main Site Wastestream Descriptions**
- **Site 300 Wastestream Descriptions**

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Waste Disposal Requisition Instructions

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LAWRENCE LIVERMORE NATIONAL LABORATORY

WASTE DISPOSAL REQUISITION

Waste Run Date:

1. Label/Waste Type: (*Must check*)

	RCRA	CA
❑ Non-Haz		
❑ Haz	❑	❑
❑ Low-Level		
❑ TRU	❑ No Disposal Option	

W

2. Container Serial Number or Retention Tank ID:

3. For TRU Waste, TRU Waste Container Serial No.: **L L 8 5 _ _ _ _ _ _ T R U**

4. Container Acceptable: ❑ Yes ❑ N/A Initials: _____

Chemical Compatibility Code:

Storage Restrictions
❑ No Storage Restrictions
Not acceptable at the following locations:
❑ 233 ❑ 514 ❑ 612 ❑ 693
CWAA ❑ 169 ❑ 361 ❑ 612-4

5. Building No.:

6. Room No.:

7. RMMA: ❑ Yes ❑ No

8. WAA No.:

9. Workplace Start Date: ___/___/___

10. Workplace End Date: ___/___/___

11. Account No.: _ _ _ _ - _ _

12. Directorate: _ _ _

13. Did Waste Minimization Effort Practices Begin in Current Calendar Year? ❑ Yes ❑ No
If yes, enter Activity Code: W_____
Comments:_____

14. WEF/PKE/SAW No.: ❑ WEF No. ❑ PKE No. ❑ SAW No. ❑ N/A
Specify: _____

15. Waste Package Seals Applied: ❑ Yes ❑ N/A (if yes, complete Step 16)

16. Waste Package Seal Nos.:

17. Source Code:

❑ Lab Pack ❑ Over Pack

18. LLW Waste Stream No. or TRU Waste Form No.:

19. Hazardous Properties: ❑ Toxic ❑ Corrosive ❑ Ignitable ❑ Reactive

20. Waste Form: ❑ Solid ❑ Liquid ❑ Gas ❑ Sludge

21. Outer Container Type: ❑ Box ❑ Can ❑ Carboy ❑ Drum ❑ Tank - Fixed ❑ Tank - Portable ❑ Transportainer ❑ Sack ❑ SWB ❑ Tub
Other: _____

22. Outer Container Size/Vol: ❑ 1 gal ❑ 2 gal ❑ 5 gal ❑ 30 gal ❑ 55 gal ❑ 85 gal ❑ 330 gal ❑ 660 gal ❑ 750 gal ❑ 1000 gal ❑ 5000 gal ❑ 67 cu ft ❑ 1 × 1 × 1.5 ❑ 2 × 4 × 7 ❑ 4 × 4 × 7 ❑ gal ❑ cu ft
Other: _____

23. Item No.	24. Spent or Unused (S/U)	25. Organic or Inorganic (O/I)	26. Waste Form (s, sl, l, g)	27. Waste Description (For multiple parcels, also list Parcel Card Nos.)	28. Hazardous Constituents and Concentrations	29. Item Container Size	30. Quantity per Item Amount	Units	31. Analysis Sample No.	Physical Waste Data: 32. Aqueous Only pH	Normality	33. Flash Point

USE CONTINUATION FORM FOR ADDITIONAL ITEMS

34. Does the waste contain radioactive components? ❑ Yes ❑ No (If yes, complete Steps 38-43 as applicable to waste type.)

This section (Steps 35-37) is required for Hazardous Waste generated in a RMMA

35. Was the waste kept isolated from any operation that could have produced radioactive contamination (using a glove box, vent hood, etc.)? ❑ Yes ❑ No (If no, full rad analysis required)

36. Was the waste exposed to particle beams capable of inducing radioactivity by activation? ❑ Yes ❑ No (If yes, full rad analysis required)

37. Describe other controls used to prevent radioactive contamination:
_____
_____
_____

38. Radionuclides:

Check all Plutonium grades present:
❑ Weapons
❑ Fuel
❑ Reactor
❑ Am-enriched
❑ Mixed

Check all Uranium grades present:
❑ Depleted
❑ Natural
❑ Enriched
_____%234
_____%235
_____%238

(List additional radionuclides in Step 38.)

39. Gross weight of waste package: _____

40. Radiological Data:
(For certified LLW and TRU waste, list totals from Parcel Cards.)

Item	Radionuclide(s)	Quantity	Units/Activity (Ci,g)	PE - Ci	Fissile g

41. Rad. Survey mr/hr: | β–γ @ Contact | β–γ @ 1 Meter | Neutron @ Contact

42. Swipe Data: ❑ Complies with 10 CFR 835 criteria for unrestricted release

43. Rad Swipe/Survey Performed By: (Print Name–Last, First) | Employee No.: | L-Code:
Signature: | Date: | Ext.:

RMMA Certification: Shipping | CC

RSDR #:

Tare weight of container: _____

44. Generator: I certify, to the best of my knowledge, that the information provided on this requisition is correct. I understand that I may be liable to State and Federal prosecution by intentionally providing false information.
❑ Container Custodian: I certify that the waste parcels identified on this form are contained in this waste container and have been packaged in accordance with the requirements specified in the appropriate LLNL TRU Waste or Low-Level Waste Program Certification and Quality Assurance Program.

Generator or Container Custodian Name (Print – Last, First):
Signature:
Employee No.: | L-Code: | Ext.: | Date:

Inspected By (Print Name – Last, First): | **Ext.:**
Signature: | **Employee No.:** | **Date:**

Characterization Chemist Approval ❑ N/A _____ (Initials) ❑ WEF
Signature: | **Employee No.:** | **Date:**

RCA Approval ❑ WEF ❑ N/A _____ (Initials) ❑ NTS Certified _____ (Initials) ❑ WIPP Certified _____ (Initials)
Signature: | **Employee No.:** | **Date:**

❑ **HWM Use Only** ❑ **Weight Dependent** LL-5344 (Rev. 06/97) Page 1 of _____

W_____

Generator: Complete items 45 - 49, only if container contains a single parcel of solid radioactive waste, and there is no Parcel Card attached.

45. Waste Generating Procedure:

Procedure #: ❒ 332 FSP ❒ B-360 Complex FSP ❒ 331 FSP ❒ AVLIS HPP ❒ EX-404 ❒ _____

❒ SAP #: _____ ❒ Instruction #: _____

46. Method(s) used to identify radionuclides and/or determine activity: *(Check all that apply)*

❒ Process knowledge ❒ Mass ❒ Mass balance ❒ Alpha spectrometry ❒ Gamma spectrometry

❒ Liquid scintillation counting ❒ AVLIS method (❒ A ❒ B ❒ C) ❒ Tritium off gas measurement (attach results)

❒ High Sensitivity Neutron Instrument (attach results) ❒ Other _____

47. Total Parcel Weight (g, lb):

Note: If AVLIS Method C, mass or mass balance is used, use a calibrated scale.

_____ _____ Units

❒ Scale: Serial #: _____

Calibration due date: _____

❒ Estimated weight

Comments: _____

48. Will the final waste form contain any of the following? (Explain all "yes" answers)

Chelating Agents: ❒ Yes ❒ No
(e.g., Radiac Wash, > 1% by weight / pkg)

Free Liquids: ❒ Yes ❒ No

Fine Particles: ❒ Yes ❒ No
[> 1% of <10-micrometer particles (compare to flour) or >15% of <200-micrometer particles (compare to sand)]

Compressed Gases: ❒ Yes ❒ No
(e.g., non-punctured aerosol cans)

Pyrophorics: ❒ Yes ❒ No
(e.g., uranium turnings that could spontaneously combust if exposed to air)

Explosives: ❒ Yes ❒ No
(e.g., TNT, PETN, HMX, that exhibit explosive properties)

Classified Material: ❒ Yes ❒ No

Friable Asbestos: ❒ Yes ❒ No

PCBs: ❒ Yes ❒ No

Explanations: _____

49. Verifier Certification: I verify that, to the best of my knowledge, the information supplied by the waste generator on this form is complete and accurate.

Verifier Name (Print):	Verification Date:
Signature:	Employee No.:

Hazardous Appendix
HWM-801 Review

SCIL (Single Container Inventory Limits) Exceeded ❒ No ❒ Yes

pH Results obtained by: *(Check all that apply)*

❒ Meter *(Calibrated)* ❒ Field Technician ❒ Sample Team

❒ Paper ❒ Analytical ❒ Chemist

Initial: _____

CC Rule (VOC's greater or less than 500 ppm Level 1, 2, 3):

❒ CC / > 500 / A ❒ CC / < 500 / A

❒ CC / > 500 / B ❒ CC / < 500 / B

A = Generator Knowledge B = Analytical Data

Storage Locations:

❒ No storage restrictions

Waste is not acceptable for storage at the following locations: *(Check all that apply)*

❒ 233 ❒ 514 ❒ 612 ❒ Bldg. 693

❒ 169 CWAA ❒ 361 CWAA ❒ 612-4 CWAA

❒ WEF CC initials: _____

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Radiological Appendix HWM-800 Review

❒ No storage restrictions, based on Single Container Acceptable Limits.

Waste is not acceptable for storage at the following locations, based on SCAL: *(Check all that apply)*

❒ 233 ❒ 514 ❒ 612-1 ❒ 612 (other than 612-1) ❒ Bldg. 693

❒ 169 CWAA ❒ 361 CWAA

❒ Contains > 1 curie and/or is > the amount identified per radionuclide on attachment B of Procedure HWM 800.

❒ Contains > than 10 grams of fissile material (U-233, U-235, or Pu-239)

❒ WEF RCA initials: _____

Scheduled Date: ___/___/___

❒ HWM Waste Run ❒ Processed Waste

❒ Site 300 to LLNL ❒ Commercial Shipment

❒ Secured Pickup ❒ HWM Field Pump Out

❒ HWM GeneratedWaste: Loc: _____

TWMS: Initial: _____ Date: _____

Item	RCH Prefix	RCH	P	Origin Code	Form Code	EPA No.	DTSC No.	MSDS No.	Hazardous Properties T	C	I	R
									❒	❒	❒	❒
									❒	❒	❒	❒
									❒	❒	❒	❒
									❒	❒	❒	❒
									❒	❒	❒	❒
									❒	❒	❒	❒

Waste Disposal Requisition

INSTRUCTIONS

PLEASE PRINT – USE A **BLUE OR BLACK** INDELIBLE INK (NON-WATERBASED INK) PEN

USE A CONTINUATION FORM, IF ADDITIONAL SPACE IS NEEDED

BOLD BOXES ARE FOR HWM USE ONLY

TO MAKE CORRECTIONS – USE A SINGLE LINE TO CROSSOUT, THEN INITIAL AND DATE IT.

Note: All property numbered equipment MUST be retired from the property tracking system. Please fill out Property Management's "Property Number Item Retirement Form," in addition to this one for property numbered equipment that is contaminated with hazardous/radioactive materials. See your Property Center Representative for a copy of the form.

1. **Label/Waste Type** – Specify the type of waste represented by the requisition. Mark only **one** type of waste per requisition. This waste type should match the waste type identified on the container's label. For mixed waste and hazardous waste, check the RCRA and/or CA box.

2. **Container Serial Number or Retention Tank ID** – If the container has a barcode container QA serial number, document the serial number. If a Retention Tank, supply the ID number.

3. **TRU Waste Container Serial No.** – For TRU waste only, fill in the waste container serial number.

4. **Container Acceptable**– Check yes if the container is acceptable and initial. Acceptable containers are as follows:

   Assure that all containers are compatible with the waste type.

   For Hazardous Waste - Refer to Appendix A of the EPD HWM Waste Acceptance Criteria.

   For LL and TRU waste, assure that the container has no holes, no bad seams or welds, no significant rust (rust that flakes off is unacceptable, rust that wipes off is acceptable), no other defects are present and that there is an intact, non-deformed gasket on the lid of the container. Also assure that the container is marked 55 GAL or 208 L, and 17C or UN1A2.

   Additional requirements for TRU Waste Drums: Verify that a filter vent, a rigid plastic liner, a greater than or equal to 0.3 inch vent hole in the liner lid is present, and that there are no liner defects. Also verify that there is a greater than or equal to 0.0035 inch plastic liner bag is present.

   Additional requirements for TRU Waste Boxes: Verify the box is a TRUPACT-II Standard Waste Box (SWB) and that the box contains two filter vents and two plugs.

   Additional requirements for Transportainers: Verify that there are no dents or bends on any surface of the main structure greater than or equal to 3/4 inch in depth and that there are no more than two splices per bottom or top side rail. Verify that the doors are in working condition, that they contain locking rods, locking cams, handles, handle retainers, hinges, a gasket, no holes, and that they close properly. Verify that the interior floors are not warped and fasteners are not corroded. Assure that there is no visible light inside when the doors are closed. Verify that the vents have been removed and the holes have been repaired or covered.

5. **Building No.** – Enter the building number where waste was generated.

6. **Room** – Enter the room number where waste was generated. If waste was generated outside a room (cell, area, yard) provide the appropriate numbers, letters, or other identification (e.g., Yard SW of B-XXX, Tank from B-XXX). For TRU and LLW when more than one room number is identified on parcel cards, write down the room that has the most waste in the container.

7. **MA** – Indicate whether or not waste is from a MA (Radioactive Materials Management Area). If in doubt, call your Health and Safety (H&S) Technician. If waste is hazardous or non-hazardous and if this box is marked yes, complete Items 35 -37.

8. **WAA No.** – Enter the Waste Accumulation Area (WAA) number where waste is to be picked up.

9. **Workplace Start Date** – Enter the date waste was first added to the container.

10. **Workplace End Date** – Enter the date container is secured. (The container must immediately be secured once a container is filled or, for hazardous/mixed waste, the 9 month workplace accumulation time limit is reached.) If the waste is (will be) under RMMA status and the room status was changed, the container must be closed and sealed on the effective day of the change. Match the Workplace End Date listed on container label. (Hazardous/mixed waste must be moved to a WAA within 3 days.)

11. **Account No.** – Enter the VALID account number for the dept./program that generated the waste.

12. **Directorate** – Fill-in the appropriate 2 or 3 letter abbreviation representing the directorate that generated the waste. If the program who generated the waste is not known, contact the Program Manager for correct directorate abbreviation. For the latest list of directorates abbreviations, refer to the Environmental Protection Department Waste Acceptance Criteria (WAC).

BBR	Biology and Biological Technology Research Program	NAI	Nonproliferation/Arms Control/International Security
CMP	Computations	NRG	Energy
CMS	Chemistry and Material Science	NTE	Nuclear Test Experimental Science
DIR	Director's Office	PHY	Physics and Environmental Sciences
DSN	Defense Systems/Nuclear Design	PLT	Plant Operations
ENG	Engineering	SPP	Special Projects
LAS	Lasers		

13. **Waste Minimization Efforts** – Indicate whether or not the waste minimization effort commenced during the current calendar year. If yes, fill in waste minimization activity code. Refer to the EPD WAC for the list of codes. Use the comment line for activity codes that state: “Specify in Comments”. If no new activity commenced, please indicate "no".

14. **WEF/PKE/SAW No.** – If your waste has an approved Profile Number, Process Knowledge Evaluation (PKE) Number, or Sampling and Analysis Worksheet (SAW) Number, mark the appropriate box and specify the number where indicated. If the waste stream has no number, mark N/A.

15. **Waste Package Seals Applied** – For Low-Level and TRU certified waste only, specify whether waste package seal(s) have been applied to the container.

16. **Waste Package Seal Nos.** – For Low-Level and TRU certified waste only, list the numbers of the waste package seals that have been applied to the container.

17. **Source Code** – Fill-in the appropriate 4-digit source code that best describe how your waste was generated. Refer to the EPD WAC for the list of codes. NOTE: Some numbers in the source code list have changed.

18. **LLW Waste Stream No. or TRU Waste Form No.** – For Low-Level Waste, list the waste stream number associated with the waste (obtain from the Low-Level Waste Stream Evaluation Form or the Packaging Instructions). For TRU waste, list the waste form number(s) describing the waste (e.g., No 1 - Glove Box Waste; No. 2a - Solidified Liquids, oil or solvents present; No. 2b - Solidified Liquids, aqueous only; No. 3 - Metal Scrap Waste; No. 4a - Waste Salt Blocks, plastic/organics present; No. 4b - Waste Salt Blocks, organics absent; No. 5 - HEPA Filters).

19. **Hazardous Properties** – Check the box(es) that describe potential hazards associated with waste. Hazardous properties must match those marked on the label. If waste is rad only or non-hazardous, the hazardous properties box should be blank.

20. **Waste Form** – Check the box that best describes the physical form of the waste. The waste form must match the waste label.

21. **Outer Container Type** – Check the box that describes the **outermost** container. If “**Other**” is used, specify the type of container (e.g., for plastic wrapped equipment, specify pallet if the waste is on a pallet).

22. **Outer Container Size** – Check the box that describes volume capacity of the **outermost** container. If “**Other**” is used, indicate the volume and appropriate units.

23. **Item No.** – For hazardous waste, sequentially number each item in the waste container. Multiple or identical items in an overpack container are assigned unique item numbers. Using a permanent marker, physically number the individual waste items in the container to match the item numbers on the requisition. If more than six items, please use continuation form. **Not required for TRUW or solid LLW**.

24. **Spent or Unused** – For hazardous waste, enter an **S** for waste that is spent/used. Enter a **U** for waste containing unused products (e.g. out-of-date chemicals). **Not required for TRUW or solid LLW**.

25. **Organic or Inorganic** – For hazardous waste, enter an **O** for organic waste. Enter an **I** for inorganic waste. **Not required for TRUW or solid LLW**.

    - organic (≥10% organics)
    - inorganic (<10% organics)

26. **Waste Form** – For hazardous waste, enter an **S** for solid waste, **L** for liquid waste, **G** for gaseous waste, **SL** for sludge. **Not required for TRUW or solid LLW**.

When completing Steps 27 - 33:

Attach any analytical or supporting data (e.g., MSDS) to the requisition, as appropriate. Implement the following, as necessary: (These may not be applicable to radioactive only waste.)

- All waste must be characterized (e.g., oils must have flash point, PCB, VHS and % H_2O performed). If concentration or percentage of the container constituents are not known, submit a waste sample for analysis.
- Terms such as mg/l, mg/kg, grams, or % shall be used.
- MSDSs are required for unused products.
- HWM cannot accept unknowns. For advice contact your Environmental Analyst.

27. **Waste Description** – ABBREVIATIONS ARE **NOT** ALLOWED (e.g., Al for aluminum, SS for Stainless Steel)

    For solid LLW, TRUW and TRUMW list the parcel card numbers. If there is no parcel card or fill record attached, give a complete description of the waste (e.g., kimwipes, glass, stainless steel sheet)

    For hazardous, mixed waste and liquid LLW, complete the following three parts:

    (1) Enter the generator's description of the waste (e.g. vacuum pump oil, lab debris, aqueous photochemical solution, spray paint aerosol cans, Trimsol coolant wash water, mixed solvents, HEPA filters, Safety Kleen 105, etc.)

    (2) Enter the waste's matrix and percentage, such as 50% stainless steel and 15% glass or 90% water or 90–100% wood or 50% paper, 25% plastic, and 10% sand or 100% asbestos. More than one material may be needed to describe a waste's matrix. The sum of a waste's matrix plus hazardous components should not exceed 100%.

    (3) List the name of the manufacturer, if available.

    For guidance on proper generic identification, call the Chemist Review Office (ext. 3-6059 or ext. 2-8834).

28. **Hazardous Constituents** – List components that make the waste hazardous and their concentrations in descending order. Major components that contribute to the hazardous properties should be consistent with those listed on the waste label. The waste's matrix description in box 25 may be omitted when it matches listed **Hazardous Constituents**. No chemical structures or formulas may be used. For TRUMW, list the hazardous constituents described on the parcel cards and the total quantity of each in item 28.

29. **Item Container Size -** Enter the size of the container by item number (e.g., 1 gallon, 1 quart, etc.) This field is for labpack and overpacks only. **Not required for TRUW or solid LLW**.

30. **Quantity per Item** –

Amount – Enter the weight of solids, or the volume of liquids per *each* waste item. Enter the amount of waste actually contained not including the container weight. This may be the same as the outer container size.

Units – Enter the matching unit to weight or volume. Acceptable units are:

Weight: grams, kilograms, pounds, tons (2000 lb)

Volumetric: liters, milliliters, gallons (US), cubic feet

31. **Analysis Sample No.** – Use the Chemistry and Environmental Services (CES) sample number, if applicable.

32. **Aqueous Only** – (if necessary call your HWM Field Technician/Technologist or Environmental Analyst for assistance)

pH – Enter the pH of your aqueous waste (pH paper is adequate for the range of 3-10; use a meter for readings that are <3 or >10). For non-hazardous waste, pH must be in the range from 4 to 10.

Normality – Enter the normality of your aqueous waste if the pH is ≤ 2.0 or ≥ 12.5. Normality may be determined by CES analysis or if calculated, please indicate if by method used.

33. **Flash point** – For liquids, if available, enter the flash point of the waste. The flash point shall be obtained from analytical, MSDS, and/or supporting data. For non-hazardous waste, flashpoint must be above 60°C. Flash point must be documented in centigrade.

34. **Radioactive Status** – For all waste, answer the question. If you answer "YES", complete steps 38 through 43, as applicable. If you answer "NO" and the waste was generated in a RMMA (i.e., step 6 is "YES"), complete steps 35 through 37.

Items 35-37 are completed for **RMMA Waste** – For hazardous waste generated in a RMMA, answer the questions. (If wastes are not from a RMMA or are already designated as radioactive/mixed, skip these questions.)

If you answered "NO" in Step 35 and/or "Yes" in Step 36, submit a sample for radiological analysis. Full radiological analysis includes gross alpha, gross beta, (gamma spectrum if gross alpha or beta exceeds the limit of sensitivity for the instrument), and a tritium analysis. Contact the CES Laboratory (ext. 4-4127). If waste is determined to be radioactive, complete steps 38 through 43, as applicable, and change the label/designation on the requisition and the label on the container to match the waste description.

38. **Radionuclides** – For TRU or Low-Level waste containing Uranium or Plutonium, check the appropriate boxes to indicate grades of Plutonium and Uranium present.

39. **Gross Weight of Waste Package** - Specify the gross weight of package.

40. **Radiological Data** – For containers containing multiple items, enter the matching item number (see Step 23), radionuclide, total quantity per item and units for each radionuclide. For Low-Level and TRU certified waste, put a “T” (for total) under “item” and list the total of other radionuclides from the parcel cards. If the entire waste package has been assayed, put an “A” (for assayed) under “item” and list the radionuclides assayed and their quantity. The listed grade(s) will be used by HWM to calculate the other radionuclides in the grade of Plutonium and Uranium. For example:

Item	Radionuclide(s)	Quantity	Units/Activity
A	Pu-239	2.731	nano Ci
A	Pu-238	< 0.01	micro Ci
T	Dep. U	30	kg

NOTE:
depleted uranium = Dep U
natural uranium = Nat U
D-38 is not acceptable

NOTE: Units of concentration (e.g., micro Ci/liter, micro Ci/gram) are not acceptable. Write out the prefix for the units of curies (e.g., micro Ci). Acceptable activity units are: nano Ci, micro Ci, milli Ci, Ci. Grams and kilograms are also acceptable.

41. **Radiation Survey** – NOTE: Surveys are to be conducted by H&S Technician or qualified HWM Technician. Enter meter survey result(s) for radiation in appropriate box(es). For dose rates, state the maximum measured dose rates measured at surface contact and 1 meter from the external surface of the container. Express the dose rates in millirem/hour. Use N/A for radiation types that are not applicable. If reading is at background, enter the background value.

42. **Swipe Survey** – NOTE: Surveys are to be conducted by H&S Technician or qualified HWM Technician. Check the box to signify that the swipe date complies with 10 CFR 835 criteria for unrestricted release of items. See your Health Physicist if you need assistance.

43. **Radiological Survey Signature** – Name, employee number, mail stop (L-code), signature, date and phone extension number of the H&S Technician who performed the radiological survey.

44. **Generator or Container Custodian Signature** – For Low-Level and TRU certified waste, the Container Custodian certifies that the waste parcels identified on the form are contained in the waste container and the waste has been package in accordance with requirements. NOTE: Each parcel card listed is signed by the Generator. For all other waste, the Generator certifies to the best on his/her knowledge that the information provided on the requisition is correct. Enter name, employee number, mail stop (L-code), signature, date and phone extension number to document this certification.

Items 43 - 47, are to be completed only if container contains a single parcel of solid radioactive waste, and there is no Parcel Card.

45. **Waste Generating Procedure** – Identify the appropriate procedure #, packaging instructions #, or sampling and analysis plan # (SAW #).

46. **Method used to identify radionuclides and/or determine activity:** *(Check all that apply)* – Identify the method used to determine the radionuclide(s) present and the method used to determine the activity of the radionuclide(s). (e.g., If Process Knowledge was used to determine the radionuclide, and mass was used to determine the activity, check both boxes)

47. **Total Parcel Weight** – List the net weight of the parcel. Identify if this is an estimated weight or if a calibrated scale was used. NOTE: If AVLIS Method C, or mass is used to determine the activity of the waste then a calibrated scale must be used.

48. **Final Waste Form** – Supply information on whether the waste contains any of the listed materials relating to various disposal facilities' waste acceptance criteria. If you answer yes to any of the materials, explain its presence in the space provided.

49. **Verifier Certification** – The waste verifier reviews the information the generator provided and signs the verifier certification, if the information is complete and accurate to the best of their knowledge. The verifier also provides the verification date, and his or her employee number.

When complete give the WDR to the HWM Field Technician for processing.

Instructions for completing the HWM Use Only boxes -

No Disposal Option is to be checked when there is no known disposal option for the waste.

Chemical Compatibility Code: Is to be completed by the Characterization Chemist (CC). The RCA may complete for Dry Solids.

Storage Restrictions: This is completed once the RCA and CC have both completed the Appendixes on the back of the WDR. The final person to review the WDR is to complete this section.

Lab Pack/Over Pack: If the waste in the container is a lab pack or over pack, check the appropriate box; if the waste is not a lab pack or over pack leave blank. Lab pack is multiple waste items packaged together for offsite shipment. Over pack is multiple waste items packaged together for onsite transfer.

RMMA Certification: Is to be completed by the Shipping Coordinator.

RSDR #: Is to be filled in by the individual who send the waste to sewer via an RSDR.

Tare Weight of container: is to be filled in by the HWM Field Tech for TRU and LL Waste.

PE - Ci (plutonium equivalent curies) is to be completed by the RCA. This is only applicable to TRU Waste.

Fissile g is to be completed by the RCA whenever the waste contains U-233, U-235 and/or Pu-239.

Inspected By: Is to be completed by an HWM representative. This person is to assure that all documentation and waste is acceptable in accordance with the EPD WAC.

Characterization Chemist Approval: The HWM Characterization Chemist reviews the waste against Procedure HWM 801 for acceptance into the applicable storage location, and completes the Hazardous Appendix on the back page, if waste is acceptable, sign and date. The N/A box is to be checked and initialed by an RCA, when the waste is rad only, and there is an approved PKE. The WEF box is to be checked when the waste is WEFed and the Chemist review is not required.

RCA Approval: The HWM RCA reviews the waste against Procedure HWM 800 for acceptance into the applicable storage facility. If the waste meets the NTS WAC, checks that the waste is NTS Certified and initials. If the waste meets the WIPP WAC, checks that the waste is WIPP Certified and initials. Complete the Radiological Appendix; if waste is acceptable sign and date. The N/A box is to be checked and initialed by a Characterization Chemist when the waste is hazardous or non-hazardous only. The WEF box is to be checked when the waste is WEFed and the RCA review is not required.

Points to remember when filling out the WDR

Here are some reminders to assist you in filling out the WDR:

- **Box 1, Label/Waste Type –** Mark the one box, *Radioactive or Mixed* to describe your waste. In addition, mark *TRU*.
- **Box 11, Account No., and Box 12, Directorate –** For assistance with Box 10 *Account No.* and Box 11, *Directorate* , call 3-0219 or use Assist. The information in Assist is updated once a month.
- **Box 13, Waste Minimization –** Box 13, *Waste Minimization* must be filled in. If no waste min activity was practiced you must mark the box **no**.
- **Box 17, Source Code –** For the *Source Code*, enter it in Box 17; there have been some changes in the numbers and descriptions. Your field tech can help.
- **Box 22, Outer Container Type –** In Box 22 record the size of the *Outer Container* in which the waste is packed. Only "55 gal" (for a drum or "67 cu ft" (for TRUPACT-II Standard Waste Box) are allowed for TRU waste.
- **Box 27, Waste Description –** In *Waste Description*, Box 25, list the parcel card numbers. You may list more than one per line.
- **Box 38, Radiological Data –** For TRU and Mixed Waste, list radionuclides in Box 38, *Radiological Data*, **not** in Box 28 under *Hazardous Constituents.*

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List of Reference Codes

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List of Reference Codes

LLNL WASTE MINIMIZATION ACTIVITY CODES

Recycling Activity

W010 On-site recycling
W020 Off-site recycling

Source Reduction Activity

W110 Segregate types of hazardous waste to make them more amenable to recycling
W120 Segregate (stopped combining) hazardous waste from non-hazardous (Note: for purposes of hazardous waste reporting, reduces volume of hazardous waste, but does not reduce total waste volume)
W130 Improve maintenance scheduling, recordkeeping, or procedures
W140 Changed production schedule to minimize equipment and feedstock changeovers
W190 Other changes in operating practices (Specify in Comments)

Inventory Control

W210 Instituted procedures to ensure that materials do not stay in inventory beyond shelf-life
W220 Test outdated material, continue to use if still effective
W230 Eliminate shelf-life requirements for stable materials
W240 Instituted better labeling procedures
W250 Instituted clearinghouse to exchange materials that would otherwise be discarded
W290 Other (Specify in Comments)
W291 Matched procured quantities with short term needs

Spill and Leak Prevention

W310 Improved storage or stacking procedures
W320 Improved procedures for loading, unloading, and transfer operations
W330 Installed overflow alarms or automatic shut-off valves
W340 Installed secondary containment
W350 Installed vapor recovery systems
W360 Implemented inspection or monitoring programs of potential spill or leak sources
W390 Other (Specify in Comments)
W391 Improved equipment seals

Raw Material Modifications

W410 Increased purity of raw materials
W420 Substituted raw materials
W490 Other (Specify in Comments)

Process Modifications

W510 Instituted closed-loop recycling
W520 Modified equipment, layout, or piping
W530 Changed process catalyst
W540 Instituted better materials, conditions, or controls on operating conditions (flow rate, temperature, pressure, residence time)
W550 Changed from small volume containers to bulk containers to minimize discarding of empty containers
W580 Other (Specify in Comments)
W581 Increased process yield
W582 Increased equipment reliability

Cleaning and Degreasing

W590 Modified stripping/cleaning equipment
W600 Changed to mechanical stripping/cleaning devices (from solvents or other materials)
W610 Changed to aqueous cleaners (from solvents or other materials)
W620 Reduced the number of solvents used, to make waste more amenable to recycling
W630 Modified containment procedures for cleaning units
W640 Improved draining procedures
W650 Redesigned parts racks to reduce dragout
W660 Modified or installed rinse system
W670 Improved rinse equipment design
W680 Improved rinse equipment operations
W710 Other (Specify in Comments)
W711 Recycled or revised cleaning/rinse solutions

Surface Preparation and Finishing

W720 Modified spray systems or equipment
W730 Substituted coating materials used
W740 Improved application techniques
W750 Changed from spray to other systems
W780 Other (Specify in Comments)

Product Modifications

W810 Changed product specifications
W820 Modified design or composition
W830 Modified packaging
W890 Other (Specify in Comments)

Other Source Reduction Activity

W990 Specify in Comments

LLNL WASTE SOURCE CODES

Cleaning/Degreasing Operations

A010 Stripping
A020 Acid cleaning
A030 Caustic (Alkali) cleaning
A040 Flush rinsing
A050 Dip rinsing
A060 Spray rinsing
A070 Vapor degreasing
A080 Physical scraping and removal
A090 Clean out process equipment
A092 Non-routine Clean out process equipment
A191 Cleaning with Solvents
A193 Steam Cleaning operation

Surface Preparation/Finishing

A210 Painting
A220 Electroplating
A230 Electroless plating
A240 Phosphating
A250 Heat treating
A260 Pickling
A270 Etching
A293 Abrasives blasting operations
A294 Grinding/Polishing operations

Other Processes

A310 Product rinsing
A320 Product filtering
A330 Product distillation
A340 Product solvent extraction
A350 By-product processing
A360 Spent catalyst removal
A362 Non-routine Spent catalyst removal
A370 Spent process liquids removal
A372 Non-routine Spent process liquids removal
A380 Tank sludge removal
A382 Non-routine Tank sludge removal
A390 Slag removal
A400 Metal forming
A410 Plastics forming
A491 Machining/welding operations
A492 Building construction/renovation
A493 Gardening operations (fertilizer/pesticide application)
A494 Cooling processes (machine/computer, etc.)
A495 Cooling Tower (regeneration of water deionizers)
A496 Photo developing/printing/copy machine/x-ray
A497 Explosives testing
A498 Microchip processing
A499 Building maintenance

One-time and Intermittent Processes

A512 Non-routine Leak collection
A532 Non-routine Cleanup of spill residues
A540 Oil changes-maintenance
A542 Non-routine Oil changes
A550 Filter/Battery replacement
A562 Discontinue use of process equipment
A572 Discarding off-spec material
A582 Discarding unused, out-of-date products or chemicals
A591 Freon Recharging
A592 Demolition/decontamination
A593 Equipment maintenance operations
A594 Hospital/medical procedures
A595 Discarding empty containers
A596 Emptying retention tanks
A600 Sludge removal
A602 Non-routine Sludge removal

Remediation Derived Waste

A612 Superfund Remedial Action
A622 Superfund Emergency Response
A632 RCRA Corrective Action at solid waste management unit
A642 RCRA closure of hazardous waste management unit
A652 Underground storage tank cleanup
A692 Other remediation

Pollution Control or Waste Treatment

A710 Filtering/screening
A720 Metals recovery
A730 Solvents recovery
A740 Incineration/Thermal treatment
A750 Wastewater treatment
A760 Sludge dewatering
A770 Stabilization
A780 Air pollution control devices
A790 Leachate collection
A792 Asbestos removal/abatement
A793 Waste analysis (i.e. samples)
A794 Berm water collection

Miscellaneous Activities

A910 Clothing and personal protective equipment
A920 Routine cleanup wastes (e.g., floor sweepings)
A932 Closure of management unit(s) or equipment other than by remediation
A940 Laboratory wastes (excluding biomedical) (i.e. spent solutions, lab trash, etc.)
A942 Non-routine Laboratory wastes (i.e. close-out)
A943 Biomedical laboratory waste (i.e. spent solutions, lab trash, etc.)
A990 Other
A992 Non-routine Other

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Source Code Information for Item 17 of the WDR Form

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Source Code Information for Item 17 of the WDR Form

Use of Source Codes for Waste Minimization Documentation

DOE reports are required to categorize all waste generated on-site as either routine or non-routine. This category is also used to show that the laboratory has met its UC Performance Measure goals.

The source code on the waste requisition is where whether a waste has been generated though a routine or non-routine process is identified.

- **Routine waste** is that produced from any type of on-going operation, i.e., production, analytical, R&D laboratory operations, "work-for-others", or any other **periodic or recurring** activity.
- **Non-routine waste** is waste produced from environmental restoration program activities, lab closeouts (i.e., discarding off-spec or out of date materials), spill clean-ups, legacy wastes, wastes from D&D / transition operations and all TSCA wastes.

NOTE: cleanup / stabilization activities (i.e. waste generated from environmental restoration, legacy waste, and D&D operations) that generate waste may have a duration of several years. This may appear to be "on-going", but these are still non-routine wastes because they are the direct result of **past** activities and operations. Wastes produced during these operations (i.e., sampling, handling, treatment, repackaging, etc.) are also considered non-routine.

Non-routine Waste - Source Codes

A092	Non-routine clean out process equipment
A362	Non-routine spent catalyst removal
A372	Non-routine spent process liquids removal
A492	Building construction / renovation / reroofing (i.e., bldg. mat. & soils)
A512	Non-routine leak collection
A532	Non-routine cleanup of spill residues
A542	Non-routine oil changes
A562	Discontinue use of process equipment
A572	Discarding off-spec material
A582	Discarding unused, out-of-date products or chemicals
A592	Demolition / decontamination / decommissioning (bldg. or equipment)
A602	Non-routine sludge removal
A612	Superfund remedial action
A622	Superfund emergency response
A632	RCRA corrective action at solid waste management unit
A642	RCRA closure of hazardous waste management unit
A652	Storage tank cleanup (under or above ground)
A692	Other remediation
A792	Asbestos removal / abatement
A932	Closure of management unit(s) or equipment other than by remediation (WAA's, RMMA's)
A942	Non-routine laboratory wastes (i.e., close-out for lab solutions)
A992	Non-routine other

Wastestream Description for Item 27 of the WDR Form

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Wastestream Descriptions for Item 27 of the WDR Form

Introduction

Because information from the WDR undergoes computer sorting, it is vital that this information use standard, consistent terminology.

This section explains how the generic waste descriptions given in item 27 of the WDR relate to LLNL wastestreams, to help generators determine how to designate their wastestreams properly on the WDR.

Generic descriptions

The generic descriptions in item 27 of the WDR are:

- Inorganic liquids (containing <10% organics)
- Organic liquids
- Inorganic solids (containing <10% organics)
- Organic solids
- Inorganic sludges (containing <10% organics)
- Organic sludges
- Inorganic gas (containing <10% organics)
- Organic gas.

The following two tables, Main Site Wastestream Descriptions and Site 300 Wastestream Descriptions, categorize LLNL wastestreams under these eight generic categories.

Contents of the tables

Reading from left to right, the table's left hand column lists the most common wastestreams generated at LLNL. The column in the center of the table identifies whether the waste is spent or unused. The column immediately to its right lists the generic waste description. The next column indicates how a generator would describe the waste, and the far right column suggests examples for the waste matrix.

Filling in the WDR

The WDR instructions for item 27 asks for the generic description, generator's description, and the matrix of the wastestreams. The tables are designed to help the generator quickly determine the proper way to present information needed for item 27 on the WDR.

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Main Site Wastestream Descriptions

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Common Wastestreams and Corresponding Waste Description for the Waste Disposal Requisition -

The following wastestream descriptions are based upon the waste descriptions written on Waste Disposal Requisitions in 1993 and 1994. The majority of waste produced on site can be described using one of the wastestream descriptions listed below. The information listed to the right of each wastestream description may be used to complete the waste description sections of the Waste Disposal Requisition. Waste-streams that are always either spent or unused/out of date waste are identified as such in the "Spent or Unused Waste" column. The appropriate "Generic Waste Description " (e.g. Inorganic Liquid, Organic Liquid, etc...) is given in the third column. Suggestions for the "Generator's Waste Description" is given in the fourth column. In the last column, examples or suggestions are given for the "Waste Matrix".

INORGANIC LIQUIDS - Waste that is primarily inorganic and highly fluid (e.g. aqueous) with low suspended inorganic solids and low organic content (<10%).	Spent or Unused Waste	Generic Waste Description	-	Generator's Waste Description	-	Waste Matrix
Aqueous waters with low dissolved solids, including rinse waters from the following operations: copper vapor laser operation, metal finishing, machine coolant replacement, water jet cutting, printed circuit board fabrication, and equipment cleaning.	spent	Inorganic Liquid	-	(e.g. rinse water from copper vapor laser ops)	-	(e.g. water 99%)
Inorganic aqueous solutions with high total dissolved solids. Includes photographic fixers and developers, surplus aqueous inorganic chemicals, weak acids and caustics, steam cleaning and soapy rinse water, and machine or shop waste coolants.	-	Inorganic Liquid	-	(e.g. aqueous photo-developer waste)	-	(e.g. water 90% sodium bisulfite 5%)
Waste water with low concentrations of ignitable halogenated solvents resulting from metal forming processes: ethylenes and acetones.	spent	Inorganic Liquid	-	(e.g. waste water from metal fabrication)	-	(e.g. water 99%)
Waste water with low concentrations of organic compounds, metals and/or other toxic materials from machining, electronics fabrication, printing, silkscreening, paint spray booth rinse water, coolants, antifreexe mixtures, and steam cleaning.	spent	Inorganic Liquid	-	(e.g. paint spray booth rinse water)	-	(e.g. water 99%)
Waste water with low concentrations of organic compounds, metals and/or other toxic materials generated off-site from machining and laboratory research operations. Waste may contain coolants, a peroxide-bleach solution and antifreeze mixtures.	spent	Inorganic Liquid	-	(e.g. wash waster with antifreeze)	-	(e.g. water 95% ethylene glycol 5%)
Acidic aqueous rinse waters from research activities or research related production operations, including: laser window cleaning, metal finishing operations, printed circuit board manufacturing, laboratory glassware clean-up operations.	spent	Inorganic Liquid	-	(e.g. hydrochloric acid rinse water from laser window cleaning)	-	(e.g. water 99%)
Acidic solutions and rinse waters with metals from printed circuit board fabrication, copper vapor laser cleaning, electroplating, etching, metal finishing operations, battery acid, plating baths, bright dip tank solutions, and etching rinsate	spent	Inorganic Liquid	-	(e.g. rinse water with battery acid)	-	(e.g. water 99%)
Caustic aqueous rinse waters from on-site research activities or research related production operations including (but not limited to): silkscreening, metal finishing, printed circuit board fabrication, photographic processing and blue print operations.	spent	Inorganic Liquid	-	(e.g. photo processing solution with sodium hydroxide)	-	(e.g. water 99%)
Caustic solution with metals but no cyanide, resulting from metal recovery processes. Waste stream includes (but not limited to): arsenic, mercury, and silver.	spent	Inorganic Liquid	-	(e.g. silver recovery solution with sodium hydroxide)	-	(e.g. water 99%)
Caustic solutions and rinse waters with cyanide and metals generated from on-site research activities including: fabrication of printed circuit boards, printing press operations, electroplating, etching, and other metal finishing operations.	spent	Inorganic Liquid	-	(e.g. electroplating solution with	-	(e.g. water 99%)
Caustic solutions and rinse waters with metals generated from on-site research activities, including printed circuit board fabrication, photographic processing, electroplating, etching, and other metal finishing operations.	spent	Inorganic Liquid	-	(e.g. electroplating solution with	-	(e.g. water 99%)
Spent caustic inorganic aqueous waste from on-site laboratory cleanup spill residues.	spent	Inorganic Liquid	-	(e.g. aqueous sodium hydroxide waste from spill cleanup)	-	(e.g. water 99%)
Low level radioactive aqueous waste waters with low dissolved solids generated from on-site research activities including metal finishing, machine coolant replacement and water jet cutting.	spent	Inorganic Liquid	-	(e.g. waste water from metal fabrication)	-	(e.g. water 99%)
Low level radioactive coolant wash waters with low concentrations of organic compounds, metals and/or other toxic materials generated on site from machining operations. Wash waters may contain beryllium.	spent	Inorganic Liquid	-	waste coolant wash water from machining	-	(e.g. water 99%)
Low level radioactive inorganic solutions with high total dissolved solids from inorganic biomedical solutions, cyanide analysis waste, weak acid and caustics, rinse waters, machine or shop waste coolants and soapy rinse water.	spent	Inorganic Liquid	-	(e.g. coolant waste water)	-	(e.g. waster 90% potassium phosphate 5%
Low Level Radioactive waste water with solvents from sludge removal including a mixture of lead, mercury, silver, benzene, carbon tetrachloride, chloroform, Dichloroethane, Dichloroethylene, TCEs, and other spent halogenated degreasing solvents.	spent	Inorganic Liquid	-	waste water from sludge removal	-	(e.g. water 95% benzene 5%)
Low level radioactive acidic solutions and rinse waters with metals generated from research activities and electroplating and metal finishing operations: plating baths, chromic acid mixtures and nitric acid solutions from bright dip tanks.	spent	Inorganic Liquid	-	(e.g. hydrochloric acid rinsate from bright dip tanks)	-	(e.g. water 98%)
Radioactive acidic rinse waters from research activities or research related production operations, including: laser window cleaning, metal finishing operations, printed circuit board manufacturing, laboratory glassware clean-up operations.	spent	Inorganic Liquid	-	(e.g. hydrochloric acid rinsate from laser window cleaning)	-	(e.g. water 99%)
Radioactive corrosive spent acid without metals from on-site laboratory research cleanup.	spent	Inorganic Liquid	-	(e.g. spent nitric acid)	-	(e.g. water 99%)
Low level radioactive caustic aqueous rinse waters from on-site research activities or research related production operations including silk screening, metal finishing, printed circuit board fabrication, photographic processing and blue print operations.	spent	Inorganic Liquid	-	(e.g. photo processing solution with sodium hydroxide)	-	(e.g. water 99%)
Low Level Radioactive caustic solutions and rinse waters with metals from research activities, including (but not limited to): fabrication of printed circuit boards, photo-processing, electroplating, etching, and other metal fininishing operations.	spent	Inorganic Liquid	-	(e.g. electroplating solution with	-	(e.g. water 99%)

Low level radioactive spent caustic inorganic aqueous waste from on-site laboratory clean-up of spill residues.	spent	Inorganic Liquid	-	(e.g. aqueous sodium hydroxide waste from spill	-	(e.g. water 99%)
Reactive or polymerizable inorganic aqueous liquids generated from on-site research activities.	-	Inorganic Liquid	-	(e.g. pink water)	-	(e.g. water 95%)
Spill-cleanup and remediation of toxic aqueous wastes with low dissolved solids.	spent	Inorganic Liquid	-	(e.g. photo solution spill	-	(e.g. water 99%)
Water from clean up of chemical spills and leaky drums. Includes hazardous waste and heavy equipment storage yard rain water, spill clean up mop water, and retention tank water. These waters may contain acids, freon, oil, soap, and/or diesel fuel.	spent	Inorganic Liquid	-	(e.g. mop water)	-	(e.g. water 99%)
Spill cleanup of listed non-aqueous waste.	spent	Inorganic Liquid	-	(e.g. spill cleanup of silicone oil)	-	(e.g. silicone oil 90% dirt 10%)
Spill cleanup of acidic aqueous wastes from laboratories wastes, spent stripping and cleaning bath solutions from electroplating operations.	spent	Inorganic Liquid	-	aqueous (specify) acid with metals from...	-	(e.g. water 99%)
Spill cleanup of spent acid with metals from electroplating processes, wastes with chromium and other metals.	spent	Inorganic Liquid	-	(e.g. cleanup of electoplating acid)	-	(e.g. water 99%)
Mercury liquid waste from laboratory and shop clean-up, clean out of sink traps, and collection of excess electron tubes and mercury switches.	spent	Inorganic Liquid	-	(e.g. liquid mercury from sink traps)	-	(e.g. mercury 99% dirt 1%)
Decommissioned electrical equipment (with mercury components) used in on-site research activities. Includes: ignitrons, thermostats, and other items.	spent	Inorganic Liquid	-	(e.g. ignitrons with mercury)	-	(e.g. water 99%)
Inorganic liquids with chromium and silver, and inorganic non-aqueous liquids generated from on site research activities which may be ignitable and/or toxic.	spent	Inorganic Liquid	-	(e.g. silicon oil from vacuum pumps)	-	(e.g. silicon oil 100%)

ORGANIC LIQUIDS - Waste that is primarily organic (≥10) and is highly fluid, with low inorganic solids content and low-to-moderate water content.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Concentrated solvent - water solution from product solvent extraction.	spent	Organic Liquid	-	solvent extraction waste	-	(e.g water 50% methanol 50%)
Aqueous organic solution from the discontinued use of process equipment. Waste stream includes (but not limited to): methyl ethyl ketone and oxygenated solvents.	spent	Organic Liquid	-	(e.g. equipment cleaning solvents)	-	(e.g water 50% methanol 50%)
Low level radioactive concentrated solvent-water solution, ignitable from product solvent extraction.	spent	Organic Liquid	-	solvent extraction waste	-	(e.g water 50% methanol 50%)
Halogenated solvents from on-site lab operations such as cleaning, degreasing, and electronic manufacturing. Wastes aremainly composed of chlorinated and flourinated solvents such as Freon, TCE, PCE, DEC, and TCA.	spent	Organic Liquid	-	(e.g. degreasing solvents)	-	(e.g. trichloroethane 75% trichloroethylene 25%)
Spill cleanup of aqueous halogenated solvents.	spent	Organic Liquid	-	solvent spill cleanup	-	(e.g. trichloroethane 75% trichloroethylene 25%)
Low level radioactive waste with PCBs and/or halogenated solvents from on-site laboratory research activities. Waste includes glass vials, pipettes, and organic fluids.	spent	Organic Liquid	-	((e.g. spent solvents)	-	(e.g. trichloroethane 75% trichloroethylene 25%)
Radioactive halogenated solvents generated from on-site cleaning of tanks and equipment and operating of research laboratories and machining shops. Waste consists of TCE and TCA, and may contain transuranic activity.	spent	Organic Liquid	-	(e.g. degreasing solvents)	-	(e.g. trichloroethane 75% trichloroethylene 25%)
Non-halogenated (often ignitable) solvents from equipment cleaning and maintenance operations, electroplating and metal finishing, and hydraulic fluid replacement. Wastes include acetone, toluene,xylene, ethylene glycol, tetrahydrofuran, and alcohols.	spent	Organic Liquid	-	(e.g. equipment cleaning solvents)	-	(e.g. xylene 60% isopropanol 40%)
Low level radioactive non-halogenated solvents generated from on-site laboratory research and machine shop operations. Waste includes isopropyl alcohol, benzene, tributyl phosphate, and methyl isobutyl ketone.	-	Organic Liquid	-	(e.g. equipment cleaning solvents)	-	(e.g. xylene 60% isopropanol 40%)
Aqueous non-halogenated solvents from remediatin activities and discontinued use of process equipment.	spent	Organic Liquid	-	(e.g. hydraulic fluid)	-	(e.g. ethylene glycol 50% diglyme 50%)
Halogenated/non-halogenated solvent mixture from cleaning and degreasing operations. Waste stream includes (but not limited to): tetrachloroethylene, methylene chloride, chlorobenzene, acetone, isobutanol.	spent	Organic Liquid	-	(e.g. used degreasing solvents)	-	(e.g. isobutanol 60% chlorobenzene 40%)
Low Level radioactive aqueous solution of halogenated/non-halogenated solvents from equipment cleaning and maintenance operations. Includes spent halogenated solvents e.g. TCE and Chloroform. Waste includes PCBs.	spent	Organic Liquid	-	(e.g. used degreasing solvents)	-	(e.g. isobutanol 60% chlorobenzene 40%)
Oil-water emulsion or mixture from flush rinsing wastes and cleanup of oil spills.	spent	Organic Liquid	-	(e.g. oil spill cleanup)	-	(e.g. water 85% oil 15%)
Rinse and surface runoff waters that are potentially contaminated with oil. Waste includes steam cleaning water from washing of vehicles and machine parts. Waste may contain motor oil, hydraulic oil, and soaps.	spent	Organic Liquid	-	(e.g. steam cleaning water and oil)	-	(e.g. water 85% oil 15%)
Low level radioactive waste oil from cleanup of oil spills. Waste stream includes (but not limited to): cadmium, lead, silver and halogenated/non-halogenated solvents.	spent	Organic Liquid	-	oil from spill cleanup	-	(e.g. oil 90%)
Low level radioactive waste oils generated from laboratory research and machine shop operations. Waste consists of hydraulic and vacuum pump oils and may contain uranium,beryllium, mercury and/or solvents.	-	Organic Liquid	-	(e.g. vacuum pump oil changes)	-	(e.g. oil 100%)
Waste oils from oil changes, drainage of transformers and non-PCB capacitors, and disposal of excess or expired products. Waste streams include transformer oil, motor oil, vacuum pump oil, and waste oils from non-PCB capacitors.	spent	Organic Liquid	-	(e.g. vacuum pump oil changes)	-	(e.g. oil 100%)

Concentrated aqueous solution of other (non-solvent) organics from discarding of off-specification materials.	unused	Organic Liquid	-	(e.g. TSP Liquid)	-	(e.g. water 75% trisodium phosphate 10% sodium acetate 5%)
Concentrated aqueous solution of other (non-solvent) organics: spent process liquids, ignitable wastes, spent halogenated materials from research activities and surface preparation operations.	spent	Organic Liquid	-	(e.g. surface prep solution)	-	(e.g. water 75% trisodium phosphate 10% sodium acetate 5%)
Low level radioactive concentrated aqueous solution of other organics, spent process liquid, ignitable wastes, spent halogenated solvents.	spent	Organic Liquid	-	(e.g. surface prep solution)	-	(e.g. water 75% trisodium phosphate 10% sodium acetate 5%)
Superfund remediation activity containing concentrated aqueous solution of other organics.	spent	Organic Liquid	-	(e.g. TSP Liquid)	-	(e.g. water 75% trisodium phosphate 10% sodium acetate 5%)
Organic paint, lacquer or varnish from activities including: equipment clean-up, disposal of excess and waste paint, laser printer, copier and graphic production waste.. Waste includes lacquer thinner and paints. Waste may be ignitable.	-	Organic Liquid	-	(e.g. excess paint)	-	(e.g. xylene 25% mineral spirits 45% pigments 20%)
Aqueous waste of adhesives or epoxies from routine cleanup of spills.		Organic Liquid	-	(e.g. Floor-Tak spill cleanup)	-	(e.g. water 50% methyl ethyl ketone 15% chloro-heptanone 15%)
Adhesives or epoxies generated by general carpentry, floor tile installation, and other craft activities. Includes empty containers with adhesive or epoxy residues and excess product collected during clean-up.	-	Organic Liquid	-	(e.g. used Floor-Tak cans)	-	(e.g. methyl ethyl ketone 30% chloroheptanone 30% binders 30%)
Adhesives or expoxies, polymeric resin wastes from aged or surplus ignitable organics contaminated with low level radioactivity.	unused	Organic Liquid	-	(e.g. used Floor-Tak cans)	-	(e.g. methyl ethyl ketone 30% chloroheptanone 30% binders 30%)
Organic paint thinner or petroleum distillates from clean-up of painting equipment and machine parts found in laboratories and shops. Wastes include paint thinner, kerosene, mineral spirits, laquer thinner, Stoddard solvent, gasoline and diesel fuel.	spent	Organic Liquid	-	(e.g. used paint thinner)	-	(e.g. xylene 40% mineral spirits 60%)
Under ground storage tank cleanup of ignitable petroleum distillates.	spent	Organic Liquid	-	underground tank clean out	-	(e.g. petroleum distillates 100%)
Reactive or polymerizable organic liquids generated from on-site research activities. Wastes include: (but not limited to) polymeric hardeners, catalysts and uncured monomers.	unused	Organic Liquid	-	(e.g. liquid Acry-Resin)	-	(e.g. methyl methacrylate 100%)
Spill cleanup of reactive or polymerizable organic liquids.	spent	Organic Liquid	-	(e.g. Acry-Resin spill cleanup)	-	(e.g. methyl methacrylate 90% debris 10&)
Low level radioactive waste (containing H-3, C-14, P-32, S-35 and/or uranium) from laboratory and machine shop operations. Waste include oil, alcohols, kerosene, acetic acid, benzene, and scintillation gels and cocktails from tritium analysis.	-	Organic Liquid	-	(e.g. tritium tagged benzene)	-	(e.g. benzene-T6 100%)
Non-halogenated organic liquids from research and maintenance: photographic processing, machining, paint shop operations, excesses, and clean-up, including photofixers, (stable non-reactive) curing agents, and cutting fluids.	-	Organic Liquid	-	(e.g. used Trimsol)	-	(e.g. mono-ethanolamine 80%)
Organic liquids received from document reproduction and print shop activities. Waste streams include activators, photocopier toners, and dispersants. Most items in this category are excess or out-of-date copy machine, printer and print shop chemicals.	unused	Organic Liquid	-	(e.g. old out of date toner)	-	(e.g. isoparaffinic hydrocarbon solvents 90%)
Spill cleanup or decommissioned document reproduction equipment containing organic liquids.	spent	Organic Liquid	-	(e.g. toner spill cleanup)	-	(e.g. isoparaffinic hydrocarbon solvents 90%)

INORGANIC SOLIDS - Waste that is primarily inorganic and solid, with low organic content (<10%) and low-to-moderate water content; not pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Low level radioactive soil excavated from trends cleanup activities. This soil is potentially contaminated with uranium, solvents and metals.	spent	Inorganic Solid	-	soil from trends cleanup	-	(e.g. soil 95%)
Soil and concrete from on-site clean up activities, surface spills and subsurface soil investigations. These waste may contain crank case oil, hydraulic fluid, gasoline, diesel, and plastic sheeting.	spent	Inorganic Solid	-	(e.g. soil from oil spill)	-	(e.g. soil 95% debris 4% oil 1%))
Soil, concrete, or sand contaminated with organic compounds generated from drilling operations, research, and cleanup: floor repair, soil sampling, oil shale distillation, and trash cleanup. Waste streams include spent oil shale/oil contaminated soil.	spent	Inorganic Solid	-	(e.g. soil from drilling ops)	-	(e.g. soil 95% debris 4% oil 1%))
Soil and/or sand contaminated with toxic inorganic compounds generated on-site by bead blasting and subsurface investigations.	spent	Inorganic Solid	-	(e.g. bead blasting sand)	-	(e.g. sand 98%)
Soil contaminated with inorganic compounds from cleanup activities. Waste includes soil and sand contaminated with chromium.	spent	Inorganic Solid	-	(e.g. soil contaminated with chromium)	-	(e.g. soil 100%)
Soil cuttings generated from subsurface exploratory investigations. This soil may be contaminated with low level radioactivity, lead, and/or mercury.	spent	Inorganic Solid	-	(e.g. soil cuttingswith lead)	-	(e.g. soil 100%)
Ash, slag and other residue from incineration of wastes. Waste streams includes (but is not limited to): cadmium, chromium, lead, silver, and methylene chloride.	spent	Inorganic Solid	-	(e.g. ash from incinerator)	-	(e.g. ash 90%)
Dry ashes, slag or thermal residue generated on site from laboratory research and gun testing activities. Includes debris from target tanks, gun soot, solidified ash, and coal ash.	spent	Inorganic Solid	-	(e.g. blast debris)	-	(e.g. ash 90% metal slag 5%))
Sodium hydroxide solids from laboratory operations which are not chemically fixed. Include dried sludges, and excess products.	-	Inorganic Solid	-	(e.g. sodium hydroxide scale)	-	(e.g. sodium hydroxide 95%)

Clean-up of sodium hydroxide spill.	spent	Inorganic Solid	-	(e.g. sodium hydroxide spill cleanup)	-	(e.g. sodium hydroxide 95%)
Scrap metal from research and maintenance: metal finishing, cleanup, equipment, construction, electroplating, and demolition (pipes, tanks, pumps, tools, fuses, stainless steel vessel, duct work, hardware, lead bricks and oil drained transformers).	-	Inorganic Solid	-	(e.g. pipes from demolition)		(e.g. steel allow 100%)
Scrap metal generated from laboratory remodeling and cleanup, and projectile testing experiments. Waste streams include metal scrap/bricks/shavings, excess material, old equipment, glass, electrodes, tanks, plumbing, and fluorescent lights.	-	Inorganic Solid	-	(e.g. pipes from demolition)		(e.g. copper allow 100%)
Low level (potentially) radioactive inorganic scrap generated from remodeling, laboratory clean-up, and machine shop operations, including metal shavings, source material, and old equipment; i.e. scrap metal/pipes/lead bricks and uranium beds.	spent	Inorganic Solid	-	(e.g. pipes from demolition)		(e.g. steel allow 100%)
Low level radioactive lead pieces and bricks contaminated with depleted uranium and/or beryllium during off-site explosion and/or projectile research activities.	spent	Inorganic Solid	-	lead pieces and bricks	-	lead 100%
Radioactive (or potentially radioactive) scrap metal generated from laboratory research and maintenance, including laboratory cleanup. Includes lead bricks and metal shavings. These materials may contain transuranic activity.	-	Inorganic Solid	-	(e.g. lead pieces and bricks)	-	(e.g. lead 100%)
Empty metal containers from research activities, including (but not limited to): packaging, print processing, and shop wastes. Includes empty cans, drums, bottles, boxes, and other containers. These containers are often crushed by HWM.	-	Inorganic Solid	-	(e.g. empty ink cans)	-	(e.g. aluminum 95%)
Empty containers potentially contaminated with low level radioactivity.	-	Inorganic Solid	-	(e.g. empty ink cans)	-	(e.g. aluminum 95%)
Discarded batteries from battery shop and other locations. Waste streams include lithium, lead-acid, nickel-cadmium, mercury, and alkaline batteries. Most batteries are spent or damaged and may have been drained.	spent	Inorganic Solid	-	(e.g. crushed ni-cad batteries)	-	(e.g. nickel 44% nickel hydroxide 28% sodium hydroxide 6%)
Spent filters and absorbants from on-site spill cleanup activities and maintenance operations. Includes rags, chem-wipes, drysorb, kitty litter and vermiculite.	spent	Inorganic Solid	-	(e.g. photo waste spill cleanup)	-	(e.g. drysorb 70% rags 10% kimwipes 5%)
Spent filters and absorbents from research activities and facility maintenance. Waste includes paper, drysit, chemwipes, cleaning pads, rags, silica gel, oil filters, and molecular sieves.	spent	Inorganic Solid	-	(e.g. spent GC columns)	-	(e.g. stainless steel 75% silica gel 25%)
Spent HEPA filters and absorbents generated by research activities and facility maintenance. Wastes may contain low level radioactivity and solvents, lead, beryllium, and/or cadmium.	spent	Inorganic Solid	-	HEPA filters	-	(e.g. steel 50% cellulose packing 25%)
Asbestos and asbestos contaminated material generated from abatement activities. Waste stream was received from laboratory cleanups and building renovation including pipe logging, floor tiles, transite siding and pipe, blackboards and fiberglass.	spent	Inorganic Solid	-	(e.g. asbestos floor tiles)	-	(e.g. asphalt 40% asbestos 30% polyvinyl chloride 25%)
Reactive salts/chemicals that are from on-site waste operations including unused/excess chemicals from printing & metal finishing and reactive laboratory chemicals (eg., phosphorous, titanium tetrachloride, sodium, and lithium hydride).	-	Inorganic Solid	-	(e.g. sodium metal)	-	(e.g. sodium 80%)
Inorganic reactive metals and salts from decommisioning of process equipment.	spent	Inorganic Solid	-	(e.g. sodium metal)	-	(e.g. sodium 80%)
Depleted uranium hydride powder generated by on-site research activities. This waste contains low level radioactivity and is potentially ignitable and reactive.	spent	Inorganic Solid	-	depleted uranium hydride powder	-	uranium hydride
Inorganic metal salts from on-site research activities, including machine shop operations, laboratory cleanup, collection of out-of-date or excess products, laser operations and tooling replacement. Includes ferric salts and oxides.	-	Inorganic Solid	-	(e.g. out of date alumina)	-	(e.g. aluminum oxide 100)
Inorganic waste contaminated with toxics from clean-up decommissioning of process equipment and potentially contaminated with low level radioactivity.	spent	Inorganic Solid	-	(e.g. pipes with scale)	-	(e.g. stainless steel 80% nickel chloride 15%)
Low level radioactive filter cake generated from on site rotary-drum vacuum filtration of aqueous waste waters, which may contain non-halogenated and halogenated solvents and metals. Filter cake consists of diatomaceous earth and chemical precipitates.	spent	Inorganic Solid	-	waste water treatment filter cake	-	(e.g.diatomaceous earth 95% water 3% oil 1%)
Low Level radioactive inorganic trash generated by on-site research and laboratory clean-up activities. This waste includes a mixture of the following: pipettes, funnels, beakers,gloves. paper, filters, plastics, sponges, floor dry, and other lab trash.	spent	Inorganic Solid	-	(e.g. used lab materials)	-	(e.g. glass pipets 50% steel spatulas 15% ceramic crucibles 25%)
Waste inorganic solids from on-site equipment decommissioning and spill clean-up activities. Waste includes gloves, wipes, plastic sheeting, rags, dry sorb, soot, acids, mercury (broken thermometers), antifreeze and debris from gun tank experiments.	spent	Inorganic Solid	-	(e.g. broken bomb calorimeters/no visible mercury)	-	(e.g. steel 99% glass 1%)
Waste inorganic trash from research and cleanup activities, including (but not limited to): printing press, laser, battery shop, and building maintenance operations. Includes a mixture of metal, glass, filters, paper, work clothes, rubber materials.	spent	Inorganic Solid	-	(e.g. old ink cans)	-	(e.g. steel alloy cans 95% dried paint 5%)

ORGANIC SOLIDS - Waste that is primarily organic (≥10) and solid, with low-to-moderate inorganic content and water content; not pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Waste solid resins or polymerized organics from on-site document reproduction and print shop activities. Waste streams include curing agents, toner and dry film photopolymers.	unused	Organic Solid	-	(e.g. photocopy toner powder)	-	(e.g. carbon black 50% iron oxide 25% acrylic resin 20%)
Waste solid resins or polymerized organics from on-site research activities contaminated with low level radioactivity and may be corrosive and/or reactive.	-	Organic Solid	-	(e.g. polystyrene beads)	-	(e.g. polystyrene 100%)
Discarded out-of-date products or chemicals containing spent carbon generated on site from dry ink developers and ribbons. Waste stream includes (but not limited to): graphite powder and carbon black.	unused	Organic Solid	-	(e.g. carbon black)	-	(e.g. carbon black 100%)
Reactive organic solids generated from laboratory research activities and collection of excess products. Includes mainly RTV catalysts.	-	Organic Solid	-	HS II RTV HI SRT MLKMK CATALYST	-	(e.g. methoxysilane 12%, dibutyl tin dilaurate 2%)
Empty plastic containers from clean-up or sample preparation activities. Waste stream consists of an empty plastic drums that may contain a residue of biodegradable steamcleaning soap.	spent	Organic Solid	-	(e.g. alconox liquid cleaner bottles)	-	(e.g. plastic 95% detergent residue 5%)
Halogenated organic solids, with metals and halogenated/non-halogenated solvents, resulting from laboratory waste removal, filter and/or battery replacement and sludge removal.	spent	Organic Solid	-	various	-	various

Halogenated organic solids with metals and solvents from decomissioned laboratory process equipment.	spent	Organic Solid	-	various	-	various
Electrical, vacuum and machining equipment which may contain PCB laden oils from on-site research and maintenance operations. This waste includes decommissioned transformers, capacitors, power supplies, voltage regulators and milling machines.	spent	Organic Solid	-	(e.g. decommissioned transformer)	-	(e.g. steel 80% PCB oil 20%)
Non-halogenated solids from laboratory waste and disposal of clothing and personal protective equipment contaminated with low level radioactivity and non-halogenated solvents.	spent	Organic Solid	-	(e.g. used personal protective	-	(e.g. tyvex suits 25% rubber gloves 25% paper wipes 25%)
Other non-halogenated organic solids from biomedical research activities, and production derived, one time and intermittent processes. Waste streams include capacitors and used agar plates.	spent	Organic Solid	-	(e.g. used agar plates)	-	(e.g. agar 60% acrylic plates 30%)

INORGANIC SLUDGES - Waste that is primarily inorganic, with moderate-to-high water content and low organic content (<10%); and pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Low level radioactive waste water treatment sludge with toxic (<10%) organics, from sludge removal processes. Waste includes (but not limited to): spent halogenated and non-halogenated solvents.	spent	Inorganic Sludge	-	(e.g. solvent contaminated CALFRAN sludge)	-	(e.g. water 40% silica 35% nitric acid 10% methylene chloride 5%)
Waste water treatment sludge with toxic (<10%) organic compounds generated on-site from plant maintenance of cooling towers. Waste primarily consists of cooling tower resins.	spent	Inorganic Sludge	-	(e.g. cooling tower resins)	-	(e.g. water 30% polymer resins 50%)
Waste water treatment sludge with reactive sulfides from on-site research activities.	spent	Inorganic Sludge	-	(e.g. plating sludge with	-	(water 50% silica 40%)
Sludge received from off-site steam cleaning of drilling rigs used for sub-surface investigations at Site 300. Waste consists of mud, dirt, and possible organic and/or inorganic contaminants.	spent	Inorganic Sludge	-	drilling rig cleaning sludge	-	(e.g. mud/dirt 60% water 40%)
Low level radioactive inorganic sludge (containing phosphorous-32, and/or sulfur-35) from cleaning out bulking tanks and from water jet cutting. Wastes include aqua-sorb, kerosene, abrasive garnet, metals, chloro solvents, and biowaste.	spent	Inorganic Sludge	-	tank clean out water jet sludge	-	(e.g. abrasive garnet 35%% water 35% aqua sorb 25%)
Other inorganic sludges from sludge removal processes, cleaning and degreasing operations, surface coating/preparation or other surface processes. Waste includes metals, halogenated/non-halogenated solvents, metals (e.g. mercury, silver).	spent	Inorganic Sludge	-	(e.g. degreasing sludge)	-	(e.g. water 45% silicone oil 35% grease 5% dirt/sand 10%)

ORGANIC SLUDGES - Waste that is primarily organic (≥10), with low-to-moderate inorganic solids content and water content; and pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Oily sludge from on-site maintenance operations, (includingsteam cleaning, roofing, car washing and cleanup of processing equipment). Wastes includes sludges with oil, asphalt sludges, and other sump wastes.	spent	Organic Sludge	-	(e.g. asphalt sludge)	-	(asphalt 60% water 25% emulsifiers 5%)
Spill clean-up of oily sludge.	spent	Organic Sludge	-	(sludge cleanup	-	(e.g. diatomaceous earth 50% oil 25% dirt/sand/gravel 10%)
Organic paint/ink sludge from cleanup or research (e.g. silk screening, product cleanup, cold vaporization, xerox copying). Includes paint solids with drysorb, sludge from spent photo-fixers, xerox waste sludge, and film development evaporator bottoms.	spent	Organic Sludge	-	(e.g. ink sludge)	-	(e.g. inks 90%)
Ignitable organic sludges of resins, tars or tarry sludges and surplus, off-specification organics.	spent	Organic Sludge	-	(e.g. pitch sludge from coal tar distillation)	-	(e.g. pitch 95% carbon disulfide 5%)
Other organic sludges, from sludge removal and sludge dewatering. Waste stream includes (but not limited to): lead and spent halogenated solvents.	spent	Organic Sludge	-	(e.g. dewatered plasticizer extraction sludge)	-	(e.g. polyvinyl chloride 25% carbon tetrachloride 70% water 5%)

INORGANIC GASES - Waste that is primarily inorganic with a low organic content (<10%) and is a gas at atmospheric pressure.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Inorganic gases from on-site research activities which may be reactive. Waste stream includes (but is not limited to): diborane, hydrogen sulfide, fluorine, nitrogen dioxide, sulfur dioxide, and decaborane.	-	Inorganic Gas	-	(e.g. diborane cylinder)	-	(e.g. diborane 100%)

ORGANIC GASES - Waste that is primarily organic (≥10) with a low-to-moderate inorganic content and is a gas at atmospheric pressure.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Organic gases from on-site research activities, including Laser experiments, welding, and disposal of excess lab materials. Waste consists primarily of propane.	-	Organic Gas	-	(e.g. propane)	-	(e.g. propane 100%)

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Site 300 Wastestream Descriptions

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Common Wastestreams and Corresponding Waste Description for the Waste Disposal Requisition -

The following wastestream descriptions are based upon the waste descriptions written on Waste Disposal Requisitions in 1993 and 1994. The majority of waste produced on site can be described using one of the wastestream descriptions listed below. The information listed to the right of each wastestream description may be used to complete the waste description sections of the Waste Disposal Requisition. Waste-streams that are always either spent or unused/out of date waste are identified as such in the "Spent or Unused Waste" column. The appropriate "Generic Waste Description " (e.g. Inorganic Liquid, Organic Liquid, etc...) is given in the third column. Suggestions for the "Generator's Waste Description" is given in the fourth column. In the last column, examples or suggestions are given for the "Waste Matrix".

INORGANIC LIQUIDS - Waste that is primarily inorganic and highly fluid (e.g. aqueous) with low suspended inorganic solids and low organic content (<10%).	**Spent or Unused Waste**	**Generic Waste Description**	**Generator's Waste Description**	**Waste Matrix**
Aqueous inorganic solutions with high (≥1%) total dissolved solids. Includes photographic fixers and developers, surplus inorganic chemicals, weak acids and caustics, steam cleaning and soapy rinse water, and machine or shop waste coolants.	-	Inorganic Liquid	waste water from (e.g. steam cleaning)	(e.g. water 90%)
Aqueous waters with low (<1%) dissolved solids, including rinse waters from the following operations: copper vapor laser operation, metal finishing, machine coolant replacement, water jet cutting, printed circuit board fabrication, and equipment cleaning.	spent	Inorganic Liquid	waste water from (e.g. metal finishing)	(e.g. water 90%)
Waste water with low concentrations of halogenated and non-halogenated solvents from underground storage tank cleanup.	spent	Inorganic Liquid	tank cleanout rinse water	(e.g. water 90%)
Waste water with low concentrations of halogenated and non-halogenated solvents resulting from metal forming processes.	spent	Inorganic Liquid	waste water from metal fabrication	(e.g. water 90%)
Waste water with low concentrations of organic compounds, metals and/or other toxic materials from machining, drill rig and equipment cleaning, coolants, cleaning solutions, paint spray booth rinse water, and steam cleaning, and research operations	spent	Inorganic Liquid	waste waters from... (e.g. paint)	(e.g. water 90%)
Acidic aqueous rinse waters from research activities or research related production operations including (but not limited to): metal finishing operations.	spent	Inorganic Liquid	aqueous (e.g. nitric) acid rinse water from... (i.e. metal fabrication)	(e.g. water 90%)
Acidic solutions and rinse waters with metals generated from intermittent fabrication activities including: surface metal cleaning in pipe and welding shops. Waste include chromic acid mixtures and nitric acid solutions from bright dip tanks.	spent	Inorganic Liquid	aqueous (e.g. nitric) acid rinse water from... (i.e. bright dip tanks)	(e.g. water 90%)
Caustic aqueous inorganic corrosive solutions from cleaning and degreasing operations.	spent	Inorganic Liquid	aqueous caustic rinse water from degreasing	(e.g. water 90%)
Caustic aqueous solutions and rinse waters with metals generated from research activities, including (but not limited to): fabrication of printed circuit boards, photographic processing, electroplating, etching, and other metal finishing operations.	spent	Inorganic Liquid	aqueous caustic rinse water from (e.g. etching)	(e.g. water 90%)
Waste liquid mercury from laboratory and shop clean-up, clean out of sink traps, and collection of excess electron tubes and mercury switches.	-	Inorganic Liquid	liquid mercury from (e.g. sink traps)	(e.g. mercury 90%)

ORGANIC LIQUIDS - Waste that is primarily organic (≥10) and is highly fluid, with low inorganic solids content and low-to-moderate water content.	**Spent or Unused Waste**	**Generic Waste Description**	**Generator's Waste Description**	**Waste Matrix**
Concentrated solvent-water solution, ignitable, from product solvent extraction.	spent	Organic Liquid	water/solvent(s) solution from product solvent extraction	(e.g. ethyl ether 30% water 70%)
Halogenated solvents from decommissioning of degreasing process equipment.	spent	Organic Liquid	(e.g. solvents from degreasing)	(e.g. chloroform 50% trichloroethylene 50%)
Non-halogenated (often ignitable) solvents including (but not limited to): equipment cleaning and maintenance operations. Wastes include acetone, toluene, xylene, ethylene glycol, methyl ethyl ketone, and alcohol.	spent	Organic Liquid	solvents from (e.g. equipment cleaning)	(e.g. acetone 65% methanol 30%)
Ignitable halogenated/non-halogenated solvent mixture from on-site cleaning and degreasing operations. Waste stream includes (but not limited to): tetrachloroethylene, methylene chloride, chlorobenzene, acetone, isobutanol.	spent	Organic Liquid	solvents from (e.g. equipment cleaning)	(e.g. chloroform 65% methanol 30%)
On-site rinse and surface runoff waters that are potentially contaminated with oil. Waste includes steam cleaning water from washing of vehicles and machine parts. Waste may contain motor oil, hydraulic oil, and soaps.	spent	Organic Liquid	oil contaminated water from (e.g. steam cleaning)	(e.g. water 99% oil 1%)
Ignitable oil drained from decommissioned on-site electrical transformers. Waste includes (but not limited to): cadmium, lead, silver, and halogenated solvents.	spent	Organic Liquid	oil from (e.g. transformers)	(e.g. oil 100%)
Waste oil from oil changes, drainage of non-PCB transformers and capacitors, and disposal of excess or expired products. Waste stream includes transformer oil, motor oil, hydraulic oil, vacuum pump oil, and non-PCB transformers and capacitors water oil.	-	Organic Liquid	oil from (e.g. transformers)	(e.g. oil 100%)
Concentrated aqueous solution of other organics from discarding of off-specification material and other surface preparation operations.	-	Organic Liquid	(e.g. Surface prep solution)	(e.g. water 99%)
Organic paint, lacquer or varnish from on-site activities, including (but not limited to): equipment clean-up, disposal of excess and waste paint. Waste includes lacquer thinner and paints. Waste may be ignitable.	-	Organic Liquid	(e.g. leftover paints)	(e.g. petroleum distillates 67% xylene 25%)
Organic paint thinner or petroleum distillates from clean-up of painting equipment and machine parts found in various laboratory and trade shops. Wastes include paint thinner, kerosene, mineral spirits, laquer thinner, gasoline and Stoddard solvent.	-	Organic Liquid	(e.g. leftover paintthinner)	(e.g. xylene 67% mineral spirits 25%)
Non-halogenated organic liquids from research and maintenance: photographic processing, machining, paint shop operations, excesses, and clean-up, including photocopier toners, photofixers, curing agents, cutting fluids, paints, and rust preventatives.	-	Organic Liquid	(e.g. liquid copy toner)	(e.g. petroleum distillates 80%)

Water with oil and/or diesel fuel from on site spill cleanups, collection of leaks from research equipment, and clean out of diesel storage tanks.	spent	Organic Liquid	-	water and oil from (e.g. clean out of diesel storage tanks)	-	(e.g. water 99% oil 1%)

INORGANIC SOLIDS - Waste that is primarily inorganic and solid, with low organic content (<10%) and low-to-moderate water content; not pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Soil, concrete, or sand contaminated with organic compounds generated from drilling operations, research, and cleanup: floor repair, soil sampling, oil shale distillation, and trash cleanup. Waste streams include spent oil shale/oil contaminated soil.	spent	Inorganic Solid	-	(e.g. soil removed from B679 ground breaking)	-	(e.g soil 100%).
Spill cleanup of soil, concrete and sand contaminated with organic compounds.	spent	Inorganic Solid	-	(e.g. sand and charred wood from B679 fire)	-	(e.g. sand 90% charred wood 5%)
Ash, slag or other residue from incineration of wastes. Waste stream includes (but is not limited to): cadmium, chromium, lead, silver, and methylene chloride.	spent	Inorganic Solid	-	(e.g. ash from B679 incinerator)	-	(e.g. ash 90%)
Inorganic scrap generated from on-site laboratory remodeling and cleanup, and projectile testing experiments. Waste streams include metal scrap/bricks/shavings, excess material, old equipment, glass, electrodes, tanks, plumbing, and fluorescent lights.	spent	Inorganic Solid	-	(e.g. scrap metal from B679 decon)	-	(e.g. steel 80% copper 10%)
Low level radioactive lead pieces and bricks which are contaminated with depleted uranium and/or beryllium during on site explosion or projectile research activities. This waste is containerized and packed with either vermiculite or drysorb.	spent	Inorganic Solid	-	(e.g. lead bricks from weapons grade uranium shielding)	-	(e.g. lead 100%)
Scrap metal from on-site research and maintenance including equipment cleanup, construction, and demolition. Waste includes pipes, storage tanks, hoses, and tools.	spent	Inorganic Solid	-	(e.g. scrap metal from B679 decon)	-	(e.g. steel 80% copper 10%)
Empty metal containers from on-site research activities, including (but not limited to): packaging and shop wastes. Waste includes empty cans, buckets, drums, bottles, boxes, and and other containers.	spent	Inorganic Solid	-	(e.g. crushed lard cans for sample collection)	-	(e.g. steel 99%)
Discarded batteries received from on-site maintenance operations. Waste streams include lead-acid, dry cell, and alkaline batteries. Most batteries are spent or damaged.	-	Inorganic Solid	-	(e.g. drained lead acid batteries)	-	(e.g. lead 90% plastic 5%)
Spent filters and adsorbents generated by on-site research activities and facility maintenance: machine shop operations, and instrument maintenance and cleanup. Waste includes paper, dry-sit, chem-wipes, cleaning pads, rags, and and oil filters.	spent	Inorganic Solid	-	(e.g. oil filters and cleanup waste)	-	(e.g. oil filters 60% wipes 20% rags 10%)
Asbestos and material contaminated with asbestos, generated from on-site abatement activities. Waste stream includes (but is not limited to): pipe logging, floor titles, rock, and tarpaper, blackboards and fiberglass.	-	Inorganic Solid	-	(e.g. ceiling asbestos insulation)	-	(e.g. asbestos 80% steel 10%))
Reactive salts/chemicals that are from on-site waste operations including unused/excess chemicals from printing & metalfinishing and reactive laboratory chemicals (eg., phosphorous, titanium tetrachloride, sodium, and lithium hydride).	-	Inorganic Solid	-	(e.g. sodium in toluene)	-	(e.g. sodium 70% toluene 30%)
Inorganic metals and salts from on-site research activities, including (but not limited to): machine shop operations, lab cleanup, collection of out-of-date or excess products, laser operations and tooling replacement. Includes ferric salts and alloys.	-	Inorganic Solid	-	(e.g. iron pyrites from gold extraction)	-	(e.g. iron pyrites 99% potassium ferricyanide 1%)
Other waste inorganic solids from discontinued use of process equipment.	spent	Inorganic Solid	-	(e.g. residue from water tower)	-	(e.g. sodium borate 80% potassium monophosphate 15%)
Waste inorganic trash from on-site research and cleanup activities, including (but not limited to): printing press, laser, battery shop, and building maintenance operations. Includes a mixture of paper, work clothes, glass, filters, rubber materials.	spent	Inorganic Solid	-	(e.g. lab trash)	-	(e.g. glass 50% carbon fibers 25% steel 10%)

ORGANIC SOLIDS - Waste that is primarily organic (≥10) and solid, with low-to-moderate inorganic content and water content; not pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Reactive organic solids. Generated on site from lab cleanout and collection of excess products. Includes mainly RTV catalysts.	unused	Organic Solid	-	(e.g. RTV-2349 silicone rubber catalyst)	-	(e.g. tetrabutyl tin 90%)
Empty plastic containers from on-site cleanup or sample preparation activities. Waste stream consists of an empty plastic drums that may contain a residue of biodegradable steam cleaning soap.	-	Organic Solid	-	(e.g. empty poly drums)	-	(e.g. plastic 99%)
Decommissioned on-site electrical capacitors and transformers. Waste includes excess, inoperative, and leaking capacitor and insulating and castor oil. Equipment may have been subsequently drained.	spent	Organic Solid	-	(e.g. drained capacitors)	-	(e.g. steel 50% plastic 25% oil 1%)
Other non-halogenated organic solids from on-site biomedical research activities, and production derived, one time and intermittent processes. Waste streams include capacitors and used agar plates.	spent	Organic Solid	-	(e.g. dried agar plates)	-	(e.g. glass 80% agar 20%)

INORGANIC SLUDGES - Waste that is primarily inorganic, with moderate-to-high water content and low organic content (<10%); and pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Sludge and sediment generated from clean out of steam cleaning pit and sump. This material is associated with decontaminating drill rigs and may contain trace concentrations of solvents , oils, barium, cadmium, chromium, and/or lead (<10% organics).	spent	Inorganic Sludge	-	(e.g. steam pit sludge)	-	(e.g. garnet 90% soil 5% dirt/grease 5%)
Other inorganic sludges (<10% organics) from sludge removal processes, cleaning and degreasing operations, surface coating/preparation or other surface processes. Waste includes metals, halogenated/non-halogenated solvents, metals (e.g. mercury, silver).	spent	Inorganic Sludge	-	(e.g. blast pit clean out sludge)	-	(e.g. sand/soil 80% lead shot 10% steel 5%)

ORGANIC SLUDGES - Waste that is primarily organic (≥10), with low-to-moderate inorganic solids content and water content; and pumpable.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**

Sludges containing at leaste 10% organic constituents.	spent	Organic Sludge	-	(e.g. grease pit sludge)	-	(e.g. grease 50% water 40% soil/debris 10%)

INORGANIC GASES - Waste that is primarily inorganic with a low organic content (<10%) and is a gas at atmospheric pressure.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Inorganic gases from on-site research activities which may be reactive. Waste stream includes (but is not limited to): diborane, hydrogen sulfide, fluorine, nitrogen dioxide, sulfur dioxide, and decaborane.	-	Inorganic Gas	-	(e.g. diborane cylinder)	-	(e.g. diborane 100%)

ORGANIC GASES - Waste that is primarily organic (≥10) with a low-to-moderate inorganic content and is a gas at atmospheric pressure.	**Spent or Unused Waste**	**Generic Waste Description**	**-**	**Generator's Waste Description**	**-**	**Waste Matrix**
Organic gases from on-site research activities, including Laser experiments, welding, and disposal of excess lab materials. Waste consists primarily of propane.	-	Organic Gas	-	(e.g. propane)	-	(e.g. propane 100%)

Appendix C

Appendix C

Container Selection

- **Choosing a Container**
- **LLNL-Approved Containers**
- **Container Codes and Specifications**
- **Form Code and Waste Stream Description**

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Choosing a Container

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Container selection

Choosing the proper container for your wastes is essential so that they can be safely managed at your workplace and when they are transported, stored, treated, and disposed of by HWM. Using improper containers can endanger you and others who come into contact with your wastes. This appendix provides guidance on how to select the proper waste container.

LLNL-approved containers

Use the table entitled **LLNL-Approved Containers** on the following pages to help you select a container, taking into account these guidelines:

- Use only LLNL-approved waste containers
- Use separate containers for nonhazardous, hazardous, mixed, and medical wastes
- Use separate containers for liquid, solid, and gaseous (pressurized) wastes

Choosing a Container

- Select a container that is compatible with the properties of all the waste (including any reaction byproducts) that will be placed in the container, e.g.,
  - Do not put corrosives in unlined metal containers
  - Do not put chlorinated solvents in carboys or plastic lined drums
  - Do not use lard cans as secondary containment for liquid waste sent to HWM.
  - Plastic may not be used as primary containment layer for radioactive waste.

Multiple waste containers

If you generate more than one waste within a particular category (e.g., two different liquid hazardous wastes) at a time, you may need to place them in separate containers.

Some waste are incompatible with each other; reactions among incompatible waste can create dangerous fumes, cause explosions, or pose other hazards to you and your co-workers.

Small containers

If you have numerous small containers (i.e., 1-liter bottles) that are compatible with each other, they should be overpacked in a larger DOT-approved overpack container.

Each small container must be labeled with its contents. Place absorbent in the bottom of the overpack container, put the small containers on top of the absorbent, put the absorbent around and on top of the containers, and seal the overpack container.

Use enough absorbent to absorb the contents of the largest container in the overpack. The absorbent must be compatible with the waste in the container.

LLNL-Approved Containers

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LLNL-Approved Containers

Container	Stores	Capacity	Composition	Compatible waste	Incompatible waste
DOT 17E UN 1A1 Drum Closed top Bung type	8110-67866-blk 5 30 and 55 supplied by HWM	5, 30, 55 gallons	Steel	Haz & rad Used oils, used solvent mixtures solvents, chlorinated solvents, photochems pH 3-11, coolants	No concentrated acids
UN1A2 Drum Open top Lever Lock lids*	8110-41630	5 gallons	Steel	Haz & rad Lab trash, overpacked chemicals	
UN 1A2 Drum Open top Lever Lock lids*	Supplied by HWM	30, 55 gallons	Steel	Haz & rad Lab, trash, (dry) debris sludge (steam pit, cooling water, garnet) overpacked chemicals, soils	No pure metals i.e., D38
UN 6HA1 Drum w poly liner Closed top bung	Supplied by HWM	55 gallons	Polylined steel	Haz or rad Acid solution, mixtures, alkaline solution mixtures, solvents, photochem <2 or >12.5, <70% nitric	Chlorinated solvents
UN 1A1 Drum (Vented for D38)	Special order only	30, 55 gallons	Stainless steel	>70% nitric acid and D38 CHIPS	Expensive
UN 1H1 Drum Open top	8110-72387	5 gallons	Poly	Haz or rad Overpack chem. lab trash corrosive liquid	
UN 1H2 Carboy	8110-71074 Special order from stores	5 gallons	Poly	Aqueous waste with or without metals, photochems, coolants	No oils No solvents No chlorinated solvents
Fiber containers Bio boxes	8115-72381	$1 \times 1 \times 1.5$ feet	Fiber	Autoclaved medical waste Sharps & blood Rad debris	
TRU DOT 17C / UN 1A2 Open top bung and vented	Supplied by HWM	55 gallons	Galvanized steel	TRU-debris Solidified TRU liquid TRU Lab trash	

LLNL-Approved Containers (Continued)

Container	Stores	Capacity	Composition	Compatible waste	Incompatible waste
Standard waste Box	Supplied by HWM	54 × 52 × 87 inches	Steel	Container equipment Large solid TRU debris Overpacked TRU drums	
Low level waste Strong tight container	Supplied by HWM Charged to generator	Approx. 4 × 4 × 7 feet Approx. 2 × 4 × 7 feet	Steel	Rad only Construction debris contaminated equip. Glove boxes	

* Lever Lock lids are available in sizes to fit 5, 30 and 55 gallon containers. They can be used on all dry solid waste streams. They are especially useful for accumulation containers in work place accumulation areas. When the container is ready to be shipped to HWM the lever lock lids should be replaced with ring and bolt lids and the lever lock can be reused.

Container Codes and Specifications

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Container Codes and Specifications

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
001 002 003 004 101 102 104 105 106 111 112 113 114 203 206 209 219 301 302 310 319	M1	Can	1/2 pt–1 gal	Screw cap or crimp lid ("paint cans") to be overpacked, lab-packed, or consolidated (no DOT spec, used in combination packaging), may have handle
002 003 106 114 203 211 315 319 605 606	M2	Can	1–6 gal max	Steel can, UN 1A1/UN 1A2; plastic can, UN 1H2 (49 CFR 178 Subpart L)
002 206 407	M3	Can	5 gal	Steel can, UN 1A2; plastic can, UN 1H2 (49 CFR 178 Subpart L)
002 003 106 114 203 205 206 308 319 407	M4	Can	5–7 gal	Steel can, UN 1A2; plastic can, UN 1H2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 113 114 117 119 203 219 302 307 310 319 404	M5	Can	7 gal	Steel can, UN 1A2; plastic can, UN 1H2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 113 114 203 302 307 310 313 315 319 404	M6	Drum	5–110 gal	Steel drum, UN 1A2/1A1, UN 1H2 (49 CFR 178 Subpart L)
106 114 203 206 209 211 219 306 319 407	M7	Drum	5–110 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 117 119 202 203 205 206 207 209 211 307 319	M8	Drum	10–110 gal	Steel drum, UN 1A1, UN 1A2 (49 CFR 178 Subpart L)
106 114 203 319	M9	Drum	15–110 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
106 114 203 319	M10	Drum	10–110 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 203 319	M11	Drum	10–55 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
002 106 114 203 211 302 310 319 603	M12	Drum	55–110 gal	Steel drum, DOT liner 2R (49 CFR 178.360), DOT 6L (49 CFR 178.352), or 6M (49 CFR 178.354)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 203 205 206 207 211 319	M13	Drum	5–110 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
101 102 106 111 112 113 114 115 116 119 203 205 206 209 219 319 404	M14	Drum	5–55 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 114 115 116 203 205 206 209 211 319	M15	Drum	5–55 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
106 114 119 203 204 205 206 209 211 219 407 409	M16	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 205 206 209 301 302 312 316 404	M17	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 119 203 205 206 209 219	M18	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 119 203 205 206 211 219 319	M19	Drum	5–55 gal	Steel drum overpack use with DOT liner, closure applicable to liner UN 6HA1 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 202 203 204 205 206 207 209 210 211 219 301 302 309 310 404	M20	Drum	55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
103 104 105 106 107 108 109 110 114 203 206 209 211	M21	Drum	55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 119 203 205 206 207 209 211 219 309 319 404 407	M22	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
001 002 003 004 101 102 111 112 115 116 117 119 201 203 205 206 209 219 301 302 310 404		Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
001 002 003 101 102 111 112 113 114 115 116 119 203 205 206 209 211 319	M24	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
002 003 103 104 105 106 107 108 109 110 114 203 206 319 407	M25	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
002 003 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 203 205 206 207 209 211 301 302 308 309 319 403 407	M26	Drum	2–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
001 002 003 004 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 203 205 206 307 309 310 319 407	M27	Drum	5–55 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 203 206 209 211 319 407	M28	Drum	2–55 gal	Steel drum, UN 1A2 (49 CFR 178 Subpart L)
001 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 119 203 206 319 407	M29	Drum	5–55 gal	Steel drum, UN 1A2 (49 CFR 178 Subpart L)
001 002 003 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 203 205 206 209 219 301 302 319 407	M30	Drum	5 gal	Steel drum, UN 1A2/1A1 (49 CFR 178 Subpart L)
002 103 104 105 106 107 108 109 110 114 203 206 209 319 407	M31	Drum	5 gal	Steel drum, UN 1A1/1A2 (49 CFR 178 Subpart L)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
001 002 003 004 106 114 203 205 206 308 319 406 407	M32	Box	5–250 ft^3	28-7 gage steel, flat sides with overlapping lid, meets or exceeds DOT strong tight container specifications
001 002 003 101 102 112 113 114 119 201 203 315 316 319 407	M33	Box	5–250 ft^3	28-7 gage steel, flat sides with ovelapping lid, meets or exceeds DOT strong tight container specifications (used for overpacking only)
002 003 106 206 210 309 403 407	M34	Transportainer	500–2,000 ft^3	Corrugated steel wall, with forklift pockets, cam-lock double doors (no DOT spec)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M35	Portable Tank	600–660 gal	Steel portable tank, UN 11A (49 CFR 178 Subpart N)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M36	Portable Tank	750–1,100 gal	Thickness 7 gage nominal, 304 or 316 stainless steel horizontal tank with saddle, equipped with forklift pockets (no DOT spec)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M37	Portable Tank	1,100 gal	Thickness 7 gage nominal, mild steel tank, painted exterior with saddle, equipped with forklift pockets (no DOT spec)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M38	Portable Tank	400 gal	Rectangular upright (stackable), thickness 7 gage nominal, 304 or 316 stainless steel, with stantions (stackable) and forklift access (no DOT spec)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M39	Tank Trailer	1,000 gal	Stainless steel tank trailer, DOT MC312 (no longer cited in regulations) or MC412 (49 CFR 178.348)
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M40	Tank Trailer	5,000 gal	Stainless steel tank trailer, DOT MC312 (no longer cited in regulations) or MC412 (49 CFR 178.348)

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 119 201 202 203 204 205 206 207 208 209 210 211 212 219 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 519 601 602 603 604 605 606 607 608 609	M41	Tank Trailer	5,000 gal	Stainless steel tank trailer, DOT MC312 (no longer cited in regulations) or MC412 (49 CFR 178.348)
307	M43	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 3AA (49 CFR 178.937)
307 319 409 505 512 513 519	M44	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 3B (49 CFR 178.38)
307 319 409 505 512 513 519	M45	Cylinder	1/2-40 liters (<125 lb of water volume)	Nickel cylinder, DOT 3BN (49 CFR 178.39)
307 319 409 505 512 513 519	M46	Cylinder	1/2-40 liters (OD<2 in. nominal)	Steel cylinder, DOT 3E (49 CFR 178.42)
001 003 004	M47	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Aluminum cylinder DOT 3AL, (49 CFR 178.46)
307 319 409 505 512 513 519	M48	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 4B, (49 CFR 178.50)
307 319 409 505 512 513 519	M49	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 4BA, (49 CFR 178.51)
307 504 505 510 513 519 604	M50	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 4AA 480, (49 CFR 178.56)

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
307 504 505 510 513 519 604	M51	Cylinder	1/2-40 liters (Two groups <20 lb of water volume)	Steel cylinder, DOT 8, (49 CFR 178.59)
307 504 505 510 513 519 604	M52	Cylinder	1/2-40 liters (Two groups <20 lb of water volume)	Steel, cylinder, DOT 8AL, (49 CFR 178.60)
307 504 505 510 513 519 604	M53	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Steel cylinder, DOT 4BW, (49 CFR 178.61)
504 505 510 519	M54	Cylinder	1/2-40 liters (<55 lb water for <500 psig)	Seamless steel cylinder, DOT 39, (49 CFR 178.65)
504 505 510 519	M55	Cylinder	1/2-40 liters (<1,000 lb of water volume)	Aluminum cylinder, DOT 4E, (49 CFR 178.68)
201 202 203 208 210 211 401 402	M56	Drum	5 gal	Steel, removable head, UN/1A2/Y1.6/80
201 202 203 208 210 211 401 402	M57	Drum	5 gal	Steel, removable head, UN/1A2/Z2.4/80
To be assigned	M58	Drum	5 gal	Steel, removable head, UN/1A2/Y3.0/S
To be assigned	M59	Box	112 ft^3	Metal, DOT 7A Type A (49 CFR 178.350)
001 002 003 101 102 103 104 105 106 107 108 109 110 111 112 113 201 203 204 205 206	G1	Vial	1 mL–1 pt	Silicates, borosilicates, or pyrex, screw cap or ground glass stoppers, to be overpack, lab-packed, or consolidated (no DOT spec)
001 002 003 101 102 103 104 105 106 107 108 109 110 111 112 113 201 203 204 205 206	G2	Bottle or Carboy	1 pt–5 gal	Borosilicates, rubber stoppers, to be consolidated (no DOT spec)
001 002 003 205 206 301 302 310 404	C1	Bag	To fit container	Cellulose bag, UN 5M (49 CFR 178 Subpart L)
001 002 003 205 206 301 302 310 404	C2	Drum	5–75 gal	Cellulose drum, UN 1M/UN 1G

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
001 002 003 301 302	C3	Box	5–25 ft^3	Cellulose container or overpack, to be overpacked in other containers, UN 4G/UN 11G
001 002 003 301 302 308 310 404 406	C4	Box	5–250 ft^3	Cellulose container, UN 4G/UN 11G
001 002 003 319 407	C5	Box	5–250 ft^3	Cellulose container, UN 4G/UN 11G
To be assigned	C6	Box	2.5 ft^3	Plywood, UN/4D/X23/S
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113 114	P1	Jar	15 mL–1 gal	Nalgene or polyethylene, small or wide mouth, to be lab-packed (no DOT spec)
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113	P2	Bottle	5 qt max	Polyethylene bottle (no DOTspec)
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113	P3	Inner container and lining	5–13 gal	Polyethylene liner (no DOT spec)
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113 114 119	P4	Inner container and lining	5–55 gal	Polyethylene liner (no DOT spec)
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113 114 119	P5	Inner container and lining	5–55 gal	Polyethylene liner (no DOT spec)
001 004 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 119	P6	Inner container and lining	13.5–55 gal	Polyethylene liner (no DOT spec)

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
001 002 003 310 404	P7	Bag	1 gal	2 ply polyethylene film, 2 mil/ply (no DOT spec)
001 002 003 101 102 103 104 105 106 107 108 109 110 111 112 113 114 119 301 302 310 404	P8	Bag	30–85 gal	Polyethylene bag, UN 5H
002 003 301 310 404	P9	Bag	30–85 gal	5-8 mil thick, sealed bottom (no DOT spec)
001 002 003 106 114 203 319 407	P10	Drum	5–13.5 gal	Blow-molded polyethylene (no DOT spec)
001 002 003 101 102 103 104 105 106 107 108 109 110 112 113 114 119	P11	Drum	7 gal max	High density polyethylene drum, UN 1H2/UN 1H1
001 002 003 101 102 103 104 105 106 107 108 109 110 112 113 114 119	P12	Drum	2.5–55 gal	High density polyethylene drum, UN 1H1/1H2
209 211	P13	Drum	55 gal	Blow-molded high density polyethylene, steel lifting ring (no DOT spec)
001 002 003 106 114 203 206 209 211 319	P14	Drum	85 gal	Blow-molded high density polyethylene, screw on or ring lid (for overpack), (no DOT spec)
001 002 003 106 114 203 206 209 211 301 302 310 404	P15	Box	5–55 gal	Thickness ≥50 mil with overlap lid taped, meets or exceeds DOT strong tight container specifications
101 102 103 104 105 106 107 108 109 110 111 112 113 114 119	P16	Portable Tank	330 gal	DOT-E-9052, 40-in. by 48-in. by 63-in. stackable, cage with forklift pockets, linear polyethylene, 3/16-in. thick nominal
102 103 104 105 106 107 108 109 110 501 502 505	P17	Drum	5 gal	High density polyethylene, removable head, UN/1H2/Y1.5/25

*** See Form Code and Waste Stream Description**

Container Codes and Specifications (Continued)

Compatible Waste Streams by Form Codes*	Container Code†	Container Type	Capacity	Specification‡
102 103 104 105 106 107 108 109 110 501 502 505	P18	Drum	5 gal	High density polyethylene, removable head, UN/1H2/Y30/S

† Numbers are for recordkeeping only.

‡ DOT specifications that have been removed from 49 CFR Part 178 by the December 21, 1990 final rule will not be used after October 1, 1996.

Note: Containers are purchased in accordance with Federal Acquisition Regulations and procurement requirements. As a result, manufacturers and suppliers may vary, but the containers purchased meet the specifications in this table.

C = Cardboard, fiberboard, and plywood

G = Glass

M = Metal

P = Polyethylene, nalgene

Form Code and Waste Stream Description

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Form Code and Waste Stream Description

Form code	Form code description	Typical waste streams
001	Lab packs of old chemicals only	• Lab packed surplus, out-of-date, or damaged packages of laboratory chemicals and discarded aerosol cans received from research and maintenance activities.
002	Lab packs of debris only	• Lab packed debris, asbestos materials, empty aerosol cans, batteries, capacitors, and other scrap equipment from research and maintenance activities.
003	Mixed lab packs	• Lab packed mixed debris and chemicals from research and maintenance activities. • Lab packed electrical equipment, cutting fluids and / or absorbents received from chemical spill remediation, leak collection, and laboratory maintenance and cleanup activities. • Lab packed batteries, transformers and debris from research and maintenance activities. Waste may include fluids from oil drip pans.
004	Lab packs containing acute hazardous wastes	• Lab packed materials containing acute hazardous waste.
101	Aqueous waste with low solvents	• Low-level radioactive waste water with solvents from sludge removal. Wastes may include lead, mercury, silver, benzene, carbon tetrachloride, chloroform, dichloroethane, dichloroethylene, TCEs, and other spent halogenated degreasing solvents. • Waste water with low concentrations of ignitable and / or halogenated solvents resulting from metal forming processes. Wastes may include ethylene and acetone.
102[1]	Aqueous waste with low other toxic organics	• Low-level radioactive coolant wash waters with low concentrations of organic compounds, metals and / or other toxic materials generated from operations such as machining. Wash waters may contain beryllium. • Waste water with low concentrations of organic compounds, metals and / or other toxic materials from operations such as machining, electronics fabrication, printing, and silk-screening. Wastes may include paint spray booth rinse water, coolants, antifreeze mixtures, and steam cleaning water. • Waste water with low concentrations of organic compounds, metals and / or other toxic materials generated from cleanup of chemical spills and leaky drums. Wastes may include coolants, peroxide-bleach solutions, antifreeze mixtures, paint spray booth rinse water, and steam cleaning water. • Waste water with low concentrations of organic compounds, metals and / or other toxic materials generated from laboratory research and maintenance operations. Wastes may contain coolants, peroxide-bleach solutions and antifreeze mixtures.

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Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
103	Spent acid with metals	• Low-level radioactive acidic solutions and rinse waters with metals generated from research activities including electroplating and metal finishing operations. Wastes may include plating baths, chromic acid mixtures and nitric acid solutions from bright dip tanks, with at least one or more of the following metals: chromium, copper, aluminum, nickel, zinc, cadmium, lead, or beryllium. • Acidic solutions and rinse waters with metals generated from research activities including: printed circuit board fabrication, copper vapor laser cleaning, electroplating, etching and metal finishing operations. Wastes may include spent battery acid, plating baths, ferric chloride etching rinse water, chromic acid mixtures and nitric acid solutions from bright dip tanks, with at least one or more of the following metals: chromium, copper, aluminum, nickel, zinc, cadmium, or lead. • Acidic solutions and waste waters from spill cleanup of spent acid with metals from electroplating processes.
104	Spent acid without metals	• Spent acids with less than regulated levels of metals from research and maintenance activities; may contain radioactive constituents.
105	Acidic aqueous waste	• Radioactive acidic rinse waters from research activities or research-related production operations, including: laser window cleaning, metal finishing operations, printed circuit board manufacturing, and laboratory glassware cleanup operations. Wastes may include reactive anions (azide, bromate, chlorate, cyanide, fluoride, and sulfide anions). • Acidic aqueous rinse waters from research activities or research-related production operations, including: laser window cleaning, metal finishing operations, printed circuit board manufacturing, and laboratory glassware cleanup operations. Wastes may include nitric, acetic, sulfuric, hydrofluoric, hydrochloric, and phosphoric acids. • Radioactive corrosive spent acid with less than regulated levels of metals from laboratory research cleanup. • Acidic aqueous solutions from spill cleanup of acidic aqueous wastes from laboratory wastes, spent stripping and cleaning bath solutions from electroplating operations. • Acid aqueous waste including acids which are unstable at room temperatures (i.e. white fuming nitric acid).

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
106	Caustic solution with metals but no cyanides	• Caustic solutions and rinse waters with metals (but no cyanides) generated from research activities, including: printed circuit board fabrication, photographic processing, electroplating, etching, and other metal finishing operations. Wastes may include spent bleach, copper pyrophosphate, Oakite, sodium hydroxide, and ammonia solutions with at least one or more of the following metals: silver, chromium, copper, aluminum, nickel, or gold. • Caustic solution with metals (but no cyanides), resulting from metal recovery processes. Wastes may include one of the following metals: arsenic, mercury, and silver. • Low-level radioactive caustic solutions and rinse waters with metals (but no cyanides) from research activities, including: printed circuit board fabrication, photo-processing, electroplating, etching, and other metal finishing operations.
107	Caustic solution with metals and cyanides	• Caustic solutions and rinse waters with metals and cyanides generated from research activities including: printed circuit board fabrication, printing press operations, electroplating, etching, and other metal finishing operations. Wastes may include spent Oakite, DuPont-brand Riston-2000, and sodium hydroxide with cyanide, gold, silver, aluminum, or potassium hexacyanoferrate.
108	Caustic solution with cyanides but no metals	• Caustic solutions with cyanides but no metals from research and maintenance activities. Wastes may contain radioactive constituents.
109	Spent caustic	• Spent caustic waste from research and maintenance activities; may contain radioactive constituents.
110	Caustic aqueous waste	• Low-level radioactive caustic aqueous rinse waters from research activities or research-related production operations including: silk screening, metal finishing, printed circuit board fabrication, photographic processing and blue print operations. Wastes may include Oakite, peroxide-bleach solutions, and soap rinse waters. • Caustic aqueous rinse waters from research activities or research-related production operations including: silk-screening, metal finishing, printed circuit board fabrication, photographic processing, and blue print operations. • Spent caustic inorganic aqueous waste from laboratory cleanup spill residues. • Low-level radioactive spent caustic inorganic aqueous waste from laboratory cleanup of spill residues. • Corrosive inorganic aqueous solutions of spent caustic materials from cleaning and degreasing operations.
111	Aqueous waste with reactive sulfides	• Aqueous waste with reactive sulfides from research and maintenance activities.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
112	Aqueous waste with other reactives	• Reactive or polymerizable inorganic aqueous liquids generated from research and maintenance activities.
113[1]	Other aqueous waste with high dissolved solids	• Waste water with high dissolved solids from clean up of chemical spills and leaky drums. Wastes may include rain water from the hazardous waste and heavy equipment storage yards, spill cleanup mop water, and retention tank water. These waters may contain acids, Freon, oil, soap, and/or diesel fuel. • Inorganic aqueous solutions with high dissolved solids. Wastes may include photographic fixers and developers, surplus aqueous inorganic chemicals, weak acids and caustics, steam cleaning and soapy rinse water, and machine or shop waste coolants. • Low-level radioactive inorganic solutions which may include high dissolved solids from inorganic biomedical solutions, cyanide analysis waste, weak acid and caustics, rinse waters, machine or shop waste coolants and soapy rinse water.
114	Other aqueous waste with low dissolved solids	• Low-level radioactive aqueous waste waters with low dissolved solids generated from research activities including metal finishing, machine coolant replacement, and water jet cutting. • Aqueous waste waters with low dissolved solids, including rinse waters from the following operations: copper vapor laser operation, metal finishing, machine coolant replacement, water jet cutting, printed circuit board fabrication, and equipment cleaning. • Spill cleanup of low-level radioactive aqueous waste waters with low dissolved solids generated from research activities including metal finishing, machine coolant replacement, and water jet cutting. • Aqueous waste waters from spill cleanup and remediation of toxic aqueous wastes with low dissolved solids. • Aqueous waste waters with low dissolved solids generated from research activities. Wastes may include rinse waters from the following operations: copper vapor laser operation, metal finishing, machine coolant replacement, water jet cutting, printed circuit board fabrication, and equipment cleaning. Waste may also includes floodwaters from broken pipes, deionized water, and soapy water.
115	Scrubber water	• Inorganic scrubber water from air pollution control device.
116	Leachate	• Leachate from wastewater treatment and maintenance activities. Wastes may contain radioactive constituents.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
117	Waste liquid mercury	• Decommissioned electrical equipment used in research activities. Wastes may include ignitrons and thermostats. • Mercury liquid waste from laboratory and shop cleanup, clean out of sink traps, and collection of excess electron tubes and mercury switches.
119	Other inorganic liquids	• Inorganic liquids containing chromium and/or silver, and inorganic non-aqueous liquids generated from research activities. Waste may be ignitable and/or toxic. • Inorganic liquids from spill cleanup of listed non-aqueous wastes. • Low-level radioactive D-38 turnings, chips, sludge in water.
201[1]	Concentrated solvent-water solution	• Low-level radioactive concentrated solvent-water solution, ignitable from product solvent extraction. • Concentrated solvent-water solution from product solvent extraction (may be ignitable). • Aqueous organic solvent-water solution from the discontinued use of process equipment. Wastes may include methyl ethyl ketone and oxygenated solvents.
202	Halogenated solvent	• Low-level radioactive waste with PCBs and/or halogenated solvents from laboratory research activities. Wastes may include organic fluids and water. • Halogenated solvents from lab operations such as cleaning, degreasing, and electronic manufacturing. Wastes may include chlorinated and fluorinated solvents such as Freon, TCE, PCE, DEC, and TCA. • Spill cleanup of aqueous halogenated solvents. • Radioactive halogenated solvents generated from cleaning tanks and equipment and operating research laboratories and machining shops. Wastes may include TCE and TCA, and may contain transuranic activity. • Spent halogenated solvents from the decommissioning of degreasing process equipment. Wastes may be ignitable.
203[1]	Non-halogenated solvent	• Low-level radioactive non-halogenated solvents generated from laboratory research and machine shop operations. Wastes may include isopropyl alcohol, benzene, tributyl phosphate, and methyl isobutyl ketone. • Non-halogenated solvents from research activities including equipment cleaning and maintenance operations, electroplating and metal finishing, and hydraulic fluid replacement. Wastes may include acetone, ethers, toluene, xylene, other ethylene glycol, tetrahydrofuran, MEK, and alcohols. Many of these wastes may be characteristically ignitable. • Aqueous non-halogenated solvents from remediation activities and discontinued use of process equipment.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
204	Halogenated / non-halogenated solvent mixture	• Low-level radioactive aqueous solution of halogenated / non-halogenated solvents from research activities including equipment cleaning and maintenance operations. Wastes may include spent halogenated solvents (e.g. TCE and chloroform) and PCBs. • Halogenated / non-halogenated solvent mixture from cleaning and degreasing operations. Wastes may include tetrachloroethylene, methylene chloride, chlorobenzene, acetone, and isobutanol. • Aqueous solution of halogenated / non-halogenated solvent mixture waste from laboratory cleaning and degreasing activities. Wastes may include spent halogenated wastes and oxygenated and hydrocarbon solvents. Wastes may be ignitable. • Halogenated / non-halogenated solvent mixture from cleaning and degreasing operations. Wastes may include tetrachloroethylene, methylene chloride, chlorobenzene, acetone, and isobutanol. Wastes may be ignitable.
205[1]	Oil-water emulsion or mixture	• Oil-water emulsion or mixture from flush rinsing wastes and cleanup of oil spills. • Rinse and surface runoff waters that are potentially contaminated with oil. Wastes may include steam cleaning water from washing of vehicles and machine parts, motor oil, hydraulic oil, and soaps. • Aqueous oil-water emulsion. Wastes may also include barium, chromium, lead, benzene, dichloroethylene, tetrachloroethylene, and trichloroethylene. Wastes may be ignitable. • Low-level radioactive D-38 turnings, chips, sludge in an aqueous-based solution (e.g., Trim-Sol).
206[1]	Waste oil	• Low-level radioactive waste oils generated from laboratory research and machine shop operations. Wastes may include hydraulic and vacuum pump oils, uranium, beryllium, mercury and / or solvents. • Waste oils from oil changes, drainage of transformers and non-PCB capacitors, and disposal of excess or expired products. Wastes may include transformer oil, motor oil, vacuum pump oil, and waste oils from non-PCB capacitors. • Low-level radioactive waste oil from cleanup of oil spills. Wastes may include cadmium, lead, silver, halogenated and non-halogenated solvents. • Oil drained from decommissioned electrical transformers. Wastes may include cadmium, lead, silver, and halogenated and non-halogenated solvents. Wastes may be ignitable.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
207	Concentrated aqueous solution of other organics	• Low-level radioactive concentrated aqueous solution of other organics, including spent process liquid, ignitable wastes, and spent halogenated solvents. • Concentrated aqueous solution of other (non-solvent) organics including spent process liquids, ignitable wastes, and spent halogenated materials from research activities and surface preparation operations. • Concentrated aqueous solution of other (non-solvent) organics from the disposal of off-specification materials. • Concentrated aqueous solution of other organics generated from Superfund remediation activities. • Concentrated aqueous solution of other (non-solvent) organics from surface preparation operations. Waste may be ignitable.
208	Concentrated phenolics	• Concentrated phenolics from research and maintenance activities. Wastes may contain radioactive constituents.
209	Organic paint, ink, lacquer, or varnish	• Organic paint, ink, lacquer, or varnish waste generated from activities including equipment cleanup; the disposal of excess and waste paint; and laser printer, copier, and graphic production. • Organic paint, ink, lacquer, or varnish wastes which may include lacquer thinner. Waste may be ignitable.
210	Adhesives or epoxies	• Adhesives or epoxies generated by general carpentry, floor tile installation, and other craft activities. Wastes may include empty containers with adhesive or epoxy residues and excess product collected during cleanup. • Aqueous waste of adhesives or epoxies from routine cleanup of spills. • Adhesives or epoxies, polymeric resin wastes from aged or surplus ignitable organics contaminated with low-level radioactivity.
211[1]	Paint thinner or petroleum distillates	• Organic paint thinner or petroleum distillates from activities including the cleanup of painting equipment and machine parts found in laboratories and shops. Wastes may include paint thinner, kerosene, mineral spirits, lacquer thinner, Stoddard solvent, gasoline and diesel fuel. • Wastes generated from the cleanup of underground storage tanks containing ignitable petroleum distillates.
212	Reactive or polymerizable organic liquid	• Reactive or polymerizable organic liquids generated from research activities. Wastes may include peroxides, polymeric hardeners, catalysts and uncured monomers. • Wastes generated from spill cleanup of reactive or polymerizable organic liquids.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
219	Other organic liquids	• Low-level radioactive waste (containing H-3, C-14, P-32, S-35 and/or uranium) from laboratory and machine shop operations. Wastes may include oil, alcohols, kerosene, acetic acid, benzene, and scintillation gels and cocktails from tritium analysis. • Organic liquids received from document reproduction and print shop activities. Wastes may include activators, photocopier toners, and dispersants. Most items in this category are excess or out-of-date copy machine, printer and print shop chemicals. • Wastes generated from spill cleanup or decommissioned document reproduction equipment containing organic liquids, which may be ignitable and/or reactive. • Non-halogenated organic liquids from research and maintenance operations, including photographic processing, machining, paint shop operations, shop excess, and laboratory cleanup. Wastes may include photocopier toners, photographic fixers, (stable non-reactive) curing agents, cutting fluids, surplus paints, and rust preventatives.
301[1]	Soil contaminated with organics	• Soil from clean up activities, surface spills and subsurface soil investigations. These wastes may include concrete debris, crank case oil, hydraulic fluid, gasoline, diesel, and plastic sheeting. • Soil or sand contaminated with organic compounds generated from drilling operations, research, and cleanup operations including floor repair, soil sampling, oil shale distillation, and trash cleanup. Wastes may include concrete, and soil contaminated with spent oil shale/oil. • Low-level radioactive soil generated from cleanup activities. This soil may be contaminated with uranium, solvents and metals.
302	Soil contaminated with inorganics only	• Soil cuttings or sand contaminated with inorganics generated from subsurface exploratory investigations. This soil may include concrete debris; soil may be contaminated with low-level radioactivity, lead, and/or mercury. • Soil and/or sand contaminated with toxic inorganic compounds generated by bead blasting and subsurface investigations. • Soil contaminated with inorganic compounds from cleanup activities. Wastes may include soil and sand contaminated with chromium. • Low-level radioactive gravel produced from firing table tests and research activities. • Soil contaminated with inorganic compounds.
303	Ash, slag, or other residue from incineration of wastes	• Ash, slag, and other residue from incineration of wastes. Wastes may include cadmium, chromium, lead, silver, and methylene chloride.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
304	Other "dry" ash, slag, or thermal residues	• Dry ashes, slag or thermal residue generated from laboratory research and gun testing activities. Wastes may include debris from target tanks, gun soot, solidified ash, and coal ash.
305	"Dry" lime or metal hydroxide solids chemically "fixed"	• Metal hydroxide solids (including sodium hydroxide solids) from laboratory operations which are chemically fixed. Wastes may be dried sludges and excess products.
306	"Dry" lime or metal hydroxide solids not chemically "fixed"	• Metal hydroxide solids (such as sodium hydroxide solids) from laboratory operations which are not chemically fixed. Wastes may include dried sludges and excess products. • Wastes generated from the cleanup of metal hydroxide solid spills.
307[1]	Metal scale, filings, or scrap	• Low-level (potentially) radioactive inorganic scrap metal generated from remodeling, laboratory cleanup, and machine shop operations, including metal shavings, source material, and old equipment (scrap metal / pipes / lead bricks and uranium beds). • Scrap metal from research and maintenance including metal finishing, cleanup, equipment, construction, electroplating, and demolition (pipes, tanks, pumps, tools, fuses, stainless steel vessel, duct work, hardware, lead bricks, and oil drained transformers). • Scrap metal (inorganic scrap) generated from laboratory remodeling and cleanup, and projectile testing experiments. Wastes may include metal scrap / bricks / shavings, excess material, discarded old equipment, glass, electrodes, tanks, plumbing, and fluorescent lights, heat exchangers, and ducting. • Low-level radioactive lead pieces and bricks contaminated with depleted uranium and / or beryllium during off-site explosion and / or projectile research activities. • Radioactive (or potentially radioactive) scrap metal generated from laboratory research and maintenance, including laboratory cleanup. Wastes may include lead bricks and metal shavings. These materials may contain transuranic activity.
308[1]	Empty or crushed metal drums or containers	• Empty or crushed metal drums or containers from research activities, including packaging, print processing, and shop wastes. Wastes may include empty cans, drums, bottles, boxes, and other containers. • Empty containers potentially contaminated with low-level radioactivity. • Removal of discontinued process equipment, i.e., retention tanks.
309	Batteries or battery parts, casings, cores	• Discarded batteries from the battery shop and other locations. Wastes may include lithium, lead-acid, nickel-cadmium, mercury, and alkaline batteries. Most batteries are spent or damaged and may have been drained.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
310[1]	Spent solid filters or adsorbents	• Spent HEPA filters and absorbents generated by research activities and facility maintenance. Wastes may contain low-level radioactivity, solvents, lead, beryllium, and/or cadmium. • Spent filters and absorbents from research activities and facility maintenance, including machine shop and instrument maintenance and cleanup. Waste may include paper, drysit, chemwipes, cleaning pads, rags, silica gel, oil filters, and molecular sieves. • Spent filters and absorbents from spill cleanup activities and maintenance operations. Wastes may include rags, chemwipes, drysorb, kitty litter, and vermiculite.
311	Asbestos solids and debris	• Asbestos and asbestos-contaminated material generated from abatement activities. Wastes from laboratory cleanups and building renovation including pipe logging, floor tiles, rock and tar paper, transite siding and pipe, blackboards and fiberglass. • Asbestos brake shoes from vehicle maintenance. • Potentially radioactive asbestos and material contaminated with asbestos from lab cleanup. Wastes may contain transuranic activity.
312	Metal-cyanide salts/chemicals	• Metal-cyanide salts and/or chemical waste from research and maintenance activities. Wastes may contain radioactive constituents.
313	Reactive cyanide salts/chemicals	• Reactive-cyanide salts and/or chemical waste from research and maintenance activities. Wastes may contain radioactive constituents.
314	Reactive sulfide salts/chemicals	• Reactive sulfide salts and/or chemical waste from research and maintenance activities. Wastes may contain radioactive constituents.
315	Other reactive salts/chemicals	• Reactive salts/chemicals that are from waste operations including unused/excess chemicals from printing and metal finishing and reactive laboratory chemicals (e.g., phosphorous, titanium tetrachloride, sodium, and lithium hydride). • Inorganic reactive metals and salts from the decommissioning of process equipment.
316	Other metals salts/chemicals	• Inorganic metal and salts from research activities, including machine shop operations, laboratory cleanup, collection of out-of-date or excess products, laser operations, and tooling replacement. Wastes may include ferric salts and alloys, oxide powders, and other salts and alloys. • Depleted uranium hydride powder generated by research activities. This waste contains low-level radioactivity and is potentially ignitable and reactive.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
319[1]	Other waste inorganic solids	• Low-level radioactive inorganic trash generated by research and laboratory cleanup activities. Wastes may include pipettes, funnels, beakers, gloves, paper, filters, plastics, sponges, floor dry, and other lab trash. Wastes may be contaminated with beryllium, lead, and/or low-level radioactive materials. • Waste inorganic trash from research and cleanup activities, including printing press, laser, battery shop, and building maintenance operations. Wastes may include metal, glass, filters, paper, work clothes, rubber materials, and other laboratory wastes. • Waste inorganic solids from equipment decommissioning and spill cleanup activities. Wastes may include gloves, wipes, plastic sheeting, rags, dry sorb, soot, acids, mercury (broken thermometers), antifreeze, and debris from gun tank experiments. • Waste inorganic trash from research and cleanup activities, including laboratory research, road patching and building maintenance operations. Wastes may include paper, work clothes, glass filters, rubber materials, plastic shavings, and other laboratory wastes. • Filter cake, which may contain low-level radioactivity, generated from rotary-drum vacuum filtration of aqueous waste waters, which may contain non-halogenated and halogenated solvents and metals (arsenic, cadmium, barium, lead, chromium, mercury, and silver). Filter cake consists of moist diatomaceous earth and chemical precipitates. • Inorganic waste contaminated with toxics from cleanup and decommissioning of process equipment. Wastes may be contaminated with low-level radioactivity.
401	Halogenated pesticide solid	• Discarded out-of-date halogenated pesticide solids.
402	Non-halogenated pesticide solid	• Discarded out-of-date non-halogenated pesticide solids.
403	Solid resins or polymerized organics	• Waste solid resins or polymerized organics from research activities which may be contaminated with low-level radioactivity. Wastes may be corrosive and/or reactive. • Waste solid resins or polymerized organics from document reproduction and print shop activities. Wastes may include curing agents, toner, and dry film photopolymers.
404	Spent carbon	• Discarded out-of-date products or chemicals containing spent carbon generated from dry ink developers and ribbons. Wastes may include graphite powder and carbon black. • Spent granular carbon from ground water remediation. • Low-level radioactive activated charcoal or carbon from research activities.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
405	Reactive organic solid	• Reactive organic solids generated from laboratory research and maintenance activities including the collection of excess products. Wastes may include RTV catalysts.
406	Empty fiber or plastic containers	• Empty fiber or plastic containers from cleanup or sample preparation activities. Wastes may include empty plastic drums or empty plastic chemical bottles. Most containers are empty, but may contain chemical residues or residue from biodegradable steam cleaning soap.
407	Other halogenated organic solids	• Halogenated organic solids which may contain metals, non-halogenated solvents, halogenated solvents, and / or low-level radioactivity generated from the following activities: laboratory waste removal, decommissioning of laboratory process equipment, filter replacement, battery replacement, and sludge removal. Wastes may include barium, cadmium, lead, selenium, chloroform, non-halogenated solvents, and spent halogenated solvents. Wastes may be ignitable and corrosive.
409[1]	Other non-halogenated organic solids	• Non-halogenated solids from laboratory waste and disposal of clothing and personal protective equipment. Wastes may be contaminated with low-level radioactivity and non-halogenated solvents. Wastes may be ignitable. • Electrical, vacuum and machining equipment from research and maintenance operations which may contain low-level radioactivity and PCB-laden oils. Wastes may include decommissioned transformers, capacitors, power supplies, voltage regulators, and milling machines. • Other non-halogenated organic solids from biomedical research activities and production-derived, one-time and intermittent processes. Wastes may include capacitors and used agar plates.
501	Lime sludge without metals	• Lime sludge without metals generated from plant maintenance activities. • Low level radioactive lime sludge without metals generated from plant maintenance activities.
502	Lime sludge with metals / metal hydroxide sludge	• Lime sludge with metals generated from plant maintenance activities. • Low level radioactive lime sludge with metals generated from plant maintenance activities.
503	Waste water treatment sludge with toxic organics	• Waste water treatment sludge with toxic (<10%) organic compounds generated from plant maintenance of cooling towers. Wastes primarily consist of cooling tower resins. • Low-level radioactive waste water treatment sludge with toxic (<10%) organics, from sludge removal processes. Wastes include spent halogenated and non-halogenated solvents.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
504	Other waste water treatment sludge	• Waste sludge, that may contain low-level radioactivity, from the cleanup of basins and sumps. Wastes may contain oils, solvents, lead, mercury, chromium, and/or traces of cyanide.
505	Untreated plating sludge without cyanides	• Untreated plating sludge without cyanides from research and maintenance activities. Wastes may contain radioactive constituents.
506	Unreacted plating sludge with cyanides	• Unreacted plating sludge with cyanides from laboratory waste water treatments. Wastes may include cyanide and lead.
507	Other sludge with cyanides	• Other sludge with cyanides from research and maintenance activities. Wastes may contain radioactive constituents.
508	Other sludge with sulfides	• Waste water treatment sludge with reactive sulfides from research activities.
509	Sludge with other reactives	• Sludge with other reactives from research and maintenance activities. Wastes may contain radioactive constituents.
510	Degreasing sludge with metal scale or filings	• Degreasing sludge with metal scale or filings from sludge removal process. Wastes may include spent halogenated solvents and low-level radioactivity.
511	Air pollution control device sludge	• Air pollution control device sludge from waste treatment and maintenance activities. Wastes may contain radioactive constituents.
512	Sediment or lagoon dragout contaminated with organics	• Sediment or lagoon dragout contaminated with organics from maintenance activities. Wastes may contain radioactive constituents.
513	Sediment or lagoon dragout contaminated with inorganics only	• Sediment or lagoon dragout contaminated with inorganics from maintenance activities. Wastes may contain radioactive constituents.
514	Drilling mud	• Drilling mud from sub-surface investigations. Wastes may include mud, dirt, possible organic and/or inorganic contaminants, and low-level radioactivity.
515	Asbestos slurry or sludge	• Asbestos slurry or sludge from research or maintenance activities.
516	Chlorine or other brine sludge	• Chlorine or other brine sludge from waste treatment or maintenance activities.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
519[1]	Other inorganic sludges	• Low-level radioactive inorganic sludge (containing phosphorous-32, and/or sulfur-35) from cleaning out bulking tanks and from water jet cuttings. Wastes may include aqua-sorb, kerosene, abrasive garnet, metals, chloro-solvents, and biowaste. • Other inorganic sludges from sludge removal processes, cleaning and degreasing operations, surface coating/preparation or other surface processes. Wastes may include halogenated solvents, non-halogenated solvents, and metals (barium, cadmium, chromium, lead, mercury, silver). • Waste inorganic sludges from spill cleanup activities. Wastes may include pigs, wipes, and drysorb.
601	Still bottoms of halogenated solvents or other organic liquids	• Still bottoms of halogenated solvents or other organic liquid from research or maintenance activities.
602	Still bottoms of non-halogenated solvents or other organic liquids	• Still bottoms of non-halogenated solvents or other organic liquid from research or maintenance activities.
603	Oily sludge	• Oily sludge from maintenance operations including steam cleaning, roofing, car washing and cleanup of processing equipment. Wastes may include oil, asphalt, and other sump wastes. • Wastes from spill cleanup of oily sludge.
604	Organic paint or ink sludge	• Organic paint/ink sludge from cleanup or research activities including silk screening, product cleanup, cold vaporization, and Xerox copying. Wastes may include paint solids with drysorb, sludge from spent photo-fixers, Xerox waste sludge, and film development evaporator bottoms.
605	Reactive or polymerizable organics	• Reactive or polymerizable organics from research or maintenance activities.
606	Resins, tars, or tarry sludge	• Resins, tars or tarry sludges. Wastes may be ignitable. • Tarry residues or sludges from surplus, off-specification organics. Wastes may be ignitable.
607	Biological treatment sludge	• Treated biological sludge from research or maintenance activities.
608	Sewage or other untreated biological sludge	• Sewage or other untreated biological sludge from research or maintenance activities.

Continued on next page.

Form Code and Waste Stream Description (Continued)

Form code	Form code description	Typical waste streams
609	Other organic sludges	• Other organic sludges, from sludge removal and sludge dewatering. Wastes may include lead, spent halogenated solvents and low-level radioactivity.
701	Inorganic gases	• Inorganic gases from research activities. Wastes may include diborane, hydrogen sulfide, fluorine, nitrogen dioxide, sulfur dioxide, and decaborane. Wastes may be reactive.
801	Organic gases	• Organic gases from research activities, including Laser experiments, welding, and disposal of excess lab materials. Wastes may include alkanes and alkenes.

[1] Examples of waste forms that may also be generated at Site 300 and shipped to the Main Site for treatment or consolidation for commercial treatment or disposal.

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Appendix D

Appendix D

Instructions for Completing Labels

- **General Labeling Instructions**

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General Labeling Instructions

Labeling waste containers

Labeling waste containers is required by both the federal and state governments.

- Obtain all labels from Stores
- Use an indelible, black ink extra-fine point *Sharpie* pen, available from Stores. Labels filled out with other types of pens will not be accepted by HWM.
- Fill out the label as soon as the waste is placed in the designated container. Update the label whenever adding new wastes to the container.
- Fill out the label completely and accurately; improperly labeled waste containers cannot be removed from your workplace.
- Place the label on the exterior of the container where it is readily visible. If you use additional containment for the container (e.g., an overpack for several small containers) that obstructs the primary container's label, then the outside container must be labeled identically.

Waste description

The description of the waste should contain the following information:

- Waste matrix (i.e., aqueous based, organic based, solid debris – paper, metal, soil, etc.)
- Product name if spent or excess solution
- Process generating waste (if it aids in describing origin of waste).

NOTE – A generic statement identifying a hazardous contaminant, e.g., solvent, metals, acids, alkaline, etc., can be included in the waste description.

Hazardous constituents

Using available space list the chemical names of the **major** constituents that cause the waste to exhibit the identified hazardous properties.

For mixed waste, the radionuclides contained in the waste must also be listed.

Waste form

Check the waste form that describes the physical state of the waste.

NOTE – Do not use the physical state of packing material when determining the waste form (e.g., phosphorus in water should have the waste form *solid* checked.

Mistakes

If you make a mistake on the label, peel it off and use a new label. Using "white-out," initialing changes, and placing a new label on top of an old label are not acceptable.

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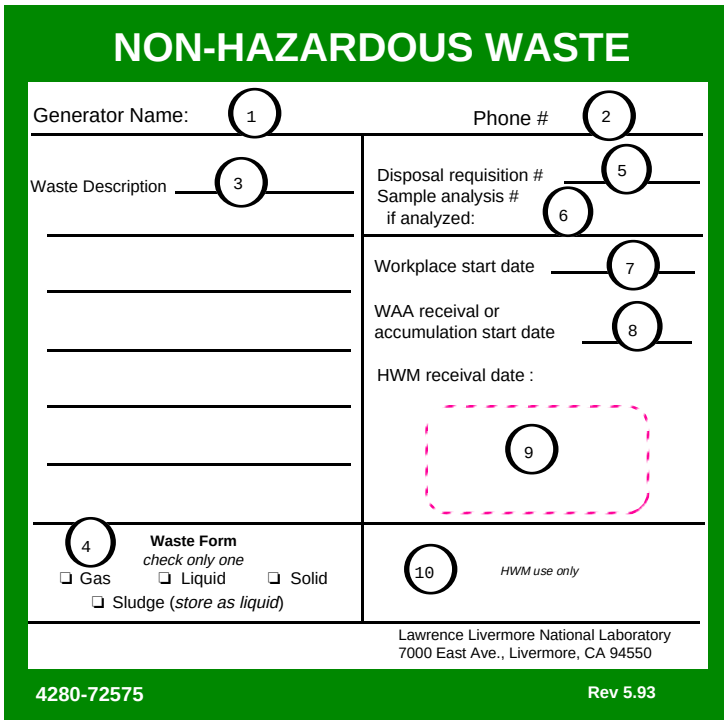
Non-Hazardous Waste Label Instructions



(1) **Generator:** Name of individual who has generated the waste. Must be the same name as is on the accompanying waste requisition.

(2) **Phone #:** Lab phone number of the generator.

(3) **Waste Description:** Describe the chemical composition of the waste with quantity / volume and type, (e.g., sewerable material, 5000 gallons).

(4) **Waste Form:** Check appropriate box (one only). Note* Different waste forms must be segregated in separate containers.

(5) **Disposal Requisition:** Copy the number (in bold type) from the upper left-hand corner of the waste disposal requisition form.

(6) **Sample analysis #:** If the waste has been analyzed, copy the seven-digit sample number from the CES Chain of Custody form.

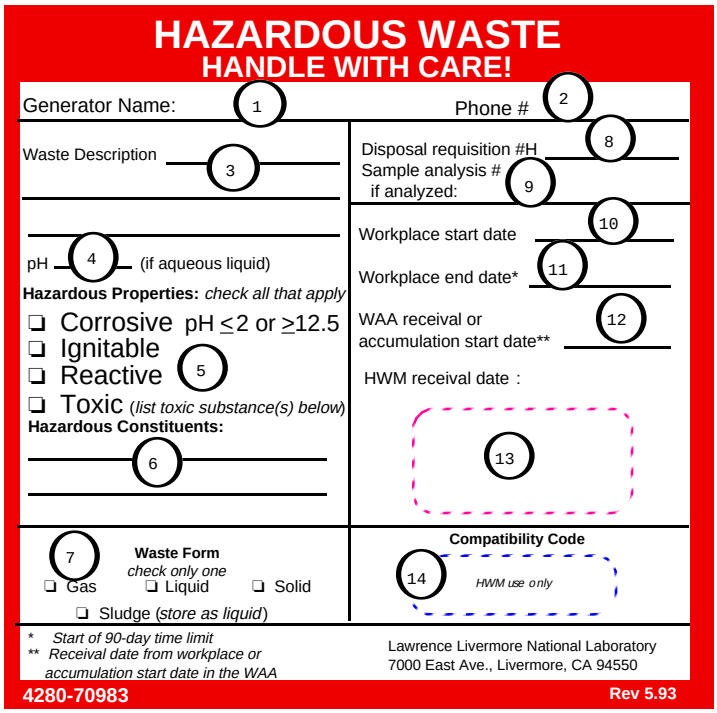
(7) **Workplace start date:** The date waste was first put into the waste container. For waste accumulated at the WAA, use the "WAA receival or accumulation date" (see item #12).

(8) **WAA receival or accumulation start date:** The date waste from the workplace first arrived at the WAA.

(9) **HWM receival date:** Filled out by HWM when the waste enters the HWM facility. HWM has one year from the receival date to transport the waste off-site.

(10) **HWM use only**: This space is for future HWM use.

Hazardous Waste Label Instructions



(1) **Generator:** Name of individual who has generated the waste. Must be the same name as is on the accompanying waste requisition.

(2) **Phone #:** Lab phone number of the generator.

(3) **Waste Description:** Describe the chemical composition of the waste with quantity / volume and type, (e.g., used photo fixer, 5 gallons). *Note:* if a brand name is listed the type of waste stream is also required (e.g., aqueous, oil, organic solvents).

(4) **pH:** List the pH if aqueous liquid.

(5) **Hazardous Properties:** Check appropriate box(es). If you do not know the hazardous properties of the waste, contact your HWM Field Tech or Environmental Analyst.

(6) **Hazardous Constituents:** Specify as many principal hazardous constituents as hazardous properties checked unless one constituent causes multiple properties to be checked, If you do not know the hazardous constituents of the waste, contact your HWM Field Tech or Environmental Analyst.

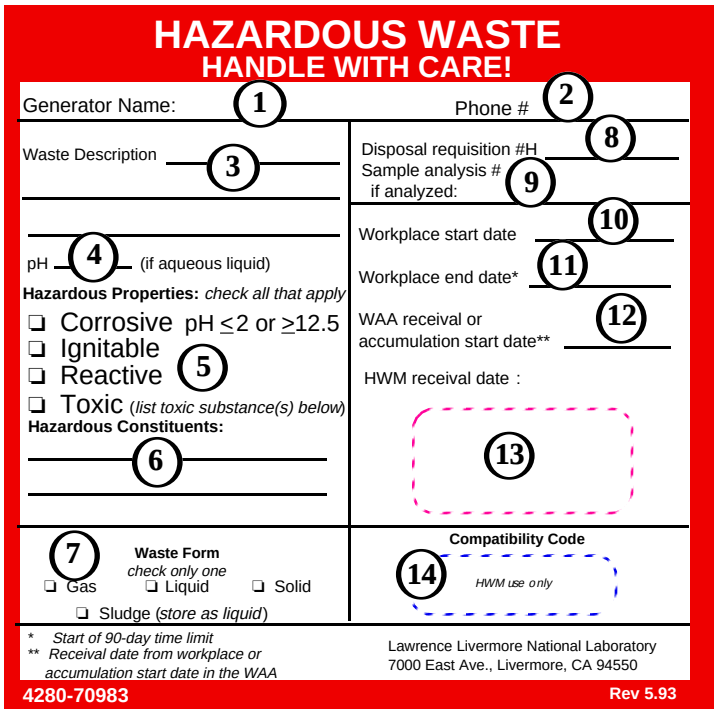
(7) **Waste Form:** Check appropriate box (one only). Note* Different waste forms must be segregated in separate containers.

(8) **Disposal Requisition:** Copy the number (in bold type) from the upper left-hand corner of the waste disposal requisition form.

(9) **Sample analysis #:** If the waste has been analyzed, copy the seven-digit sample number from the CES Chain of Custody form.

(10) **Workplace start date:** The date hazardous waste was first put into the waste container. For waste accumulated at the WAA, use the "WAA receival or accumulation date" (see item #12).

Hazardous Waste Label Instructions (continued)



(11) **Workplace end date:** The date the container was filled and/or sealed (Nine months maximum storage time for containers in the workplace). Containers must be moved to the WAA within three calendar days of this date and subsequently moved to HWM within 90 days of this date.

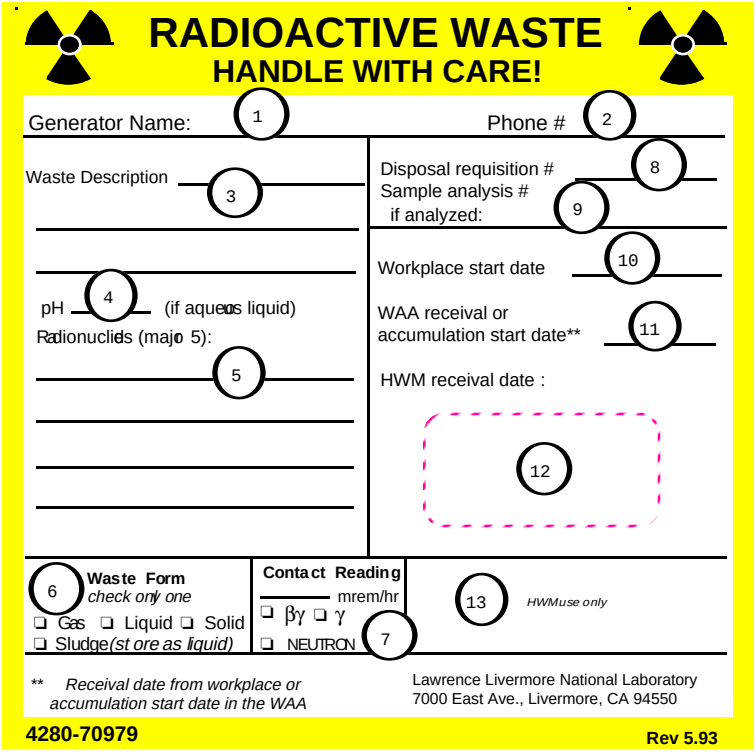
For waste accumulated at the WAA, the end date is not explicitly indicated on the label, although waste accumulated in containers at the WAA must be moved to HWM within 90 days of the WAA accumulation start date (see item #12).

(12) **WAA receival or accumulation start date:** The date waste from the workplace first arrived at the WAA. Receival date can be no later than three days after the workplace end date. (Note: the 90-day accumulation time in the WAA is calculated from the <u>workplace end date</u>, not the WAA receival date.).

(13) **HWM receival date:** Filled out by HWM when the waste enters the HWM facility. HWM has one year from the receival date to transport the waste off-site.

(14) **Compatibility Code:** Filled out by HWM prior to the waste entering the HWM facilities. This code will assist in segregation of the waste within the HWM facilities.

Radioactive Waste Label Instructions



(1) **Generator:** Name of individual who has generated the waste. Must be the same name as is on the accompanying waste requisition.

(2) **Phone #:** Lab phone number of the generator.

(3) **Waste Description:** Describe the chemical composition of the waste with quantity / volume and type, (e.g., coolant waste water, 5 gallons). *Note*: if a brand name is listed the type of waste stream is also required (e.g., aqueous, oil).

(4) **pH:** List the pH if aqueous liquid.

(5) **Radionuclides** List a maximum of 5 nuclides in descending order based on activity. If you need assistance in identifying the major radionuclides contact your HWM Field Tech or Environmental Analyst.

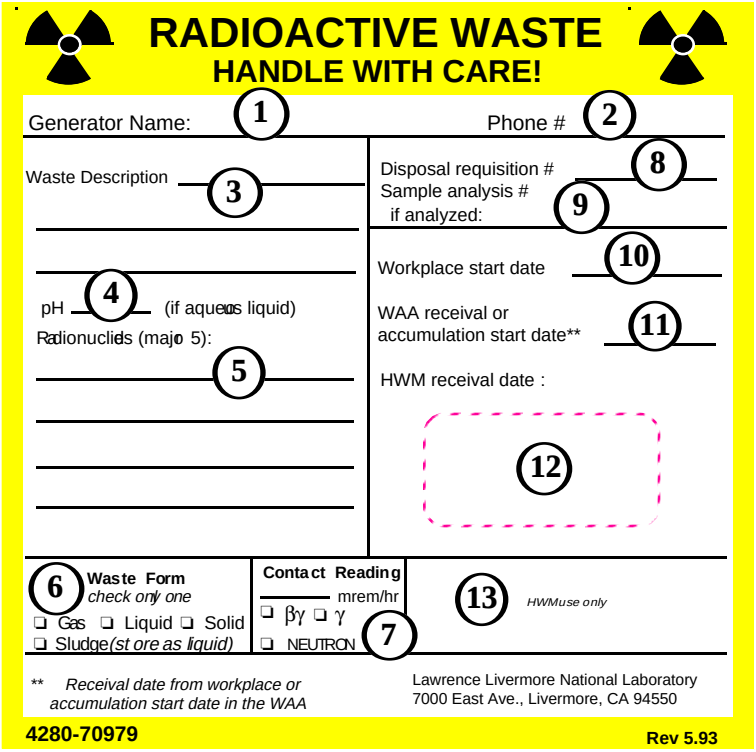
(6) **Waste Form:** Check appropriate box (one only). Note* Different waste forms must be segregated in separate containers.

(7) **Contact Reading** State the maximum measured beta-gamma, gamma, or neutron dose at surface contact (units in mR / hr). Indicate radiation type. The Hazards Control Health and Safety Tech conducts these readings.

(8) **Disposal Requisition:** Copy the number (in bold type) from the upper left-hand corner of the waste disposal requisition form.

(9) **Sample analysis #:** If the waste has been analyzed, copy the seven-digit sample number from the CES Chain of Custody form.

Radioactive Waste Label Instructions (continued)



(10) **Workplace start date:** The date radioactive waste was first put into the waste container.

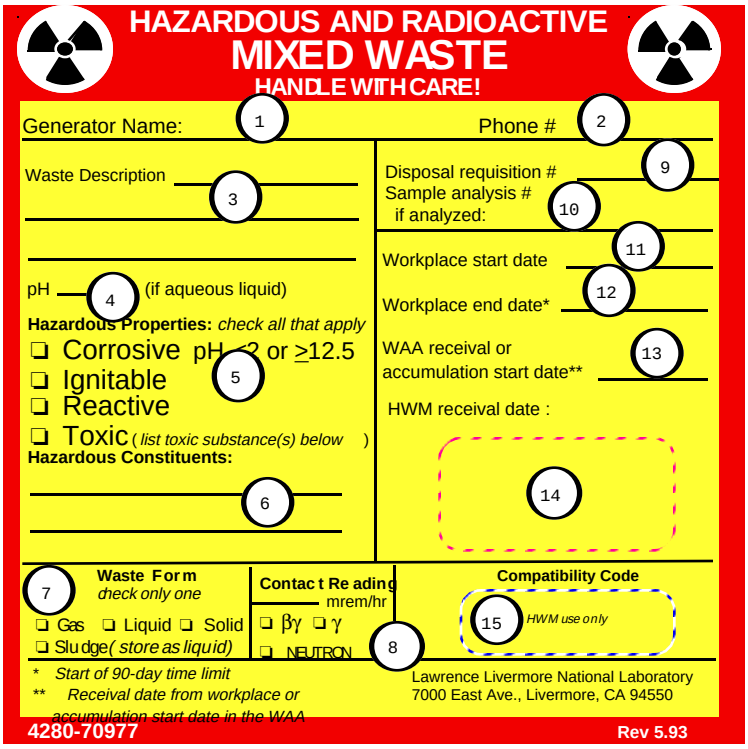
For waste accumulated at the WAA, use the "WAA receival or accumulation date" (see item #11).

(11) **WAA receival or accumulation start date:** The date waste from the workplace first arrived at the WAA. Receival date can be no later than three days after the workplace end date. (Note: the 90-day accumulation time in the WAA is calculated from the workplace end date, not the WAA receival date.)

(12) **HWM receival date:** Filled out by HWM when the waste enters the HWM facility. HWM has one year from the receival date to transport the waste off-site.

(13) **HWM use only**: This space is for future HWM use.

Mixed Waste Label Instructions



(1) **Generator:** Name of individual who has generated the waste. Must be the same name as is on the accompanying waste requisition.

(2) **Phone #:** Lab phone number of the generator.

(3) **Waste Description:** Describe the chemical composition of the waste with quantity / volume and type (e.g., "oil contaminated with heavy metal, 5 gallons). *Note:* if a brand name is listed the type of waste stream is also required (e.g., aqueous, oil, organic solvents).

(4) **pH:** List the pH if aqueous liquid.

(5) **Hazardous Properties:** Check appropriate box(es). If you do not know the hazardous properties of the waste, contact your HWM Field Tech or Environmental Analyst.

(6) **Hazardous Constituents:** Specify as many principal hazardous constituents properties checked unless one constituent causes multiple properties to be checked. If you do not know the hazardous constituents of the waste, contact your HWM Field Tech or Environmental Analyst.

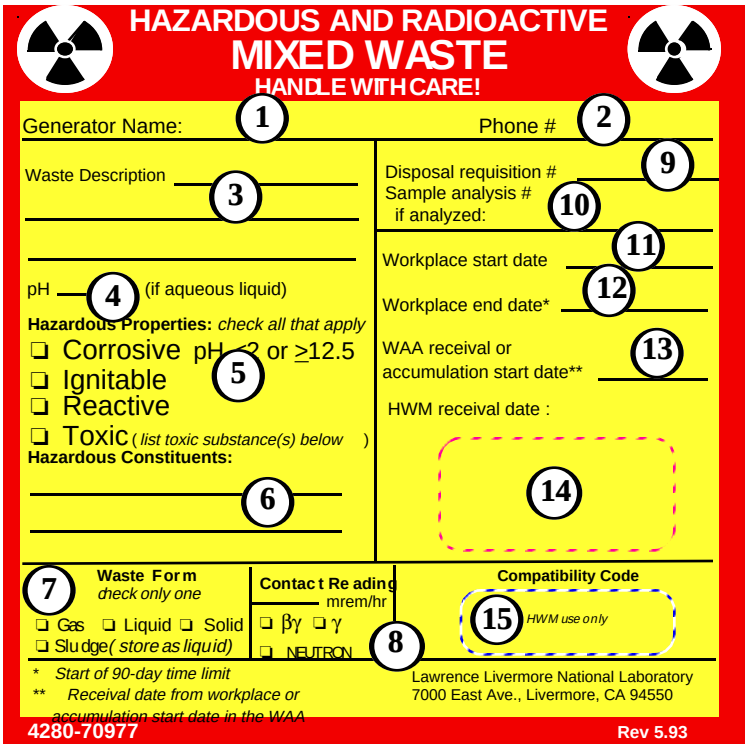
(7) **Waste Form:** Check appropriate box (one only). Note* Different waste forms must be segregated in separate containers.

(8) **Contact Reading** State the maximum measured beta-gamma, gamma, or neutron dose at surface contact (units in mR / hr). Indicate radiation type. The Hazards Control Health and Safety Tech conducts these readings.

(9) **Disposal Requisition:** Copy the number (in bold type) from the upper left-hand corner of the waste disposal requisition form.

(10) **Sample analysis #:** If the waste has been analyzed, copy the seven-digit sample number from the CES Chain of Custody form.

Mixed Waste Label Instructions (continued)



11 Workplace start date: The date mixed waste was first put into the waste container.
For waste accumulated at the WAA, use the "WAA receival or accumulation date" (see item #13)

12 Workplace end date: The date the container was filled and/or sealed (Nine months maximum storage time for containers in the workplace). Containers must be moved to the WAA within three calendar days of this date and subsequently moved to HWM within 90 days of this date.

For waste accumulated at the WAA, the end date is not explicitly indicated on the label, although waste accumulated in containers at the WAA must be moved to HWM within 90 days of the WAA accumulation start date (see item #13)

13 WAA receival or accumulation start date: The date waste first arrived at the WAA from the workplace . Receival date can be no later than three days after the workplace end date. (Note: the 90-day accumulation time in the WAA is calculated from the <u>workplace end date</u>, not the WAA receival date.)

14 HWM receival date: Filled out by HWM when the waste enters the HWM facility. HWM has one year from the receival date to transport the waste off-site.

15 Compatibility Code: Filled out by HWM prior to the waste entering the HWM facilities. This code will assist in segregation of the waste within the HWM facilities.

Appendix E

Appendix E

Guidelines to Chemical Compatibility

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Guidelines to Chemical Compatibility

This appendix is a chemical-compatibility guide adapted from that developed by the U.S. Coast Guard.[1] The guide is based in part on information provided to the Coast Guard by the National Academy of Sciences, U.S. Coast Guard Advisory Committee on Hazardous Materials. It serves as a "rule-of-thumb" guide for relatively common materials. The most comprehensive guide for chemical compatibility is *A Method of Determining the Compatibility of Hazardous Wastes*.[2]

U.S. Coast Guard Chemical Compatibility Guide

Accidentally mixing one chemical compound with another may, in some cases, result in a hazardous chemical reaction. The consequences of such a reaction include the generation of toxic gases, the heating, overflowing, and rupturing of containers, fire, and explosion. The chemical-compatibility chart in Table 1 shows combinations of chemicals that are dangerously reactive when mixed. Note, however, that the table provides a broad grouping of chemicals with an extensive variety of possible binary combinations. Although one group can be considered dangerously reactive with another group where an "X" appears in the table, there may be some combinations between the groups that would not react dangerously. This chart is offered as an aid in handling chemicals safely, but should not be considered infallible. The proper safeguards should always be taken to prevent accidental mixing of two chemicals marked by an "X" in the table.

Procedures for Determining Chemical Compatibility

1. The reactivity group of a particular product can be determined by referring to the alphabetical list in Table 2.
2. Once the number of the reactivity group has been determined, return to Table 1. Find that number and its associated reactivity group in the column at the left of the table. Proceed across the page. An "X" indicates a reactivity group that forms an unsafe combination with the chemical compound in question. For example, according to Table 2, crotonaldehyde belongs to group 19 (aldehydes). Table 1 shows that chemicals in this group should be separated from sulfuric and nitric acids, caustics, ammonia, and all types of amines (aliphatic, alkanol, and aromatic). The notes at the bottom of the table refer to specific reactivity hazards within a group. An "X" is only used if all members of the group share this reactivity hazard. According to Note A at the bottom of Table 1, crotonaldehyde is also incompatible with nonoxidizing mineral acids. Once the reactive groups have been determined, refer to Table 3, which lists examples of chemical compounds in the various reactivity groups. It should be noted that there are wide variations in the reaction rates of individual combinations of chemicals within those groups shown to be reactive in Table 1.

References

1. "Guide to Chemical Compatibility," *Hazardous Chemicals Data Book*, G. Weiss, Ed. (Noyes Data Corporation, 1980), pp. 19–32.

2. H.K. Hatayama, *et al.*, *A Method of Determining the Compatibility of Hazardous Wastes*, National Technical Information Service, PD80-211005 (1980).

Table 1 - Chemical Compatibility Chart

(An "X" signifies incompatibility)

REACTIVITY GROUPS	1. NONOXIDIZING MINERAL ACIDS	2. SULFURIC ACID	3. NITRIC ACID	4. ORGANIC ACIDS	5. CAUSTICS	6. AMMONIA	7. ALIPHATIC AMINES	8. ALKANOLAMINES	9. AROMATIC AMINES	10. AMIDES	11. ORGANIC ANHYDRIDES	12. ISOCYANATES	13. VINYL ACETATE	14. ACRYLATES	15. SUBSTITUTED ALLYLS	16. ALKYLENE OXIDES	17. EPICHLOROHYDRIN	18. KETONES	19. ALDEHYDES	20. ALCOHOLS, GLYCOLS	21. PHENOLS, CRESOLS	22. CAPROLACTAM SOLUTION	
1 NONOXIDIZING MINERAL ACIDS		X			X	X	X	X	X	X	X	X	X			X	X		A	E			1
2 SULFURIC ACID	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	2
3 NITRIC ACID		X			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		3
4 ORGANIC ACIDS		X			X	X	X	X	C			X				X	X			F			4
5 CAUSTICS	X	X	X	X							X	X				X	X		X	X	X	X	5
6 AMMONIA	X	X	X	X						X	X	X	X			X	X		X				6
7 ALIPHATIC AMINES	X	X	X	X							X	X	X	X	X	X	X	X	X	X	X	X	7
8 ALKANOLAMINES	X	X	X	X							X	X	X	X	X	X	X	B	X				8
9 AROMATIC AMINES	X	X	X	C							X	X							X				9
10 AMIDES	X	X	X			X						X									X		10
11 ORGANIC ANIYDRIDES	X	X	X		X	X	X	X	X														11
12 ISOCYANATES	X	X	X	X	X	X	X	X	X	X					D					X		X	12
13 VINYL ACETATE	X	X	X			X	X	X															13
14 ACRYLATES		X	X				X	X															14
15 SUBSTITUTED ALLYLS		X	X				X	X				D											15
16 ALKYLENE OXIDES	X	X	X	X	X	X	X	X															16
17 EPICHLOROHYDRIN	X	X	X	X	X	X	X	X															17
18 KETONES		X	X				X	B															18
19 ALDEHYDES	A	X	X		X	X	X	X	X														19
20 ALCOHOLS, GLYCOLS	E	X	X	F	X		X					X											20
21 PHENOLS CRESOLS		X	X		X		X			X													21
22 CAPROLACTAM SOLUTION		X			X		X					X											22

Table 1 - Chemical Compatibility Chart (continued)

(An "X" signifies incompatibility)

REACTIVITY GROUPS	1. NONOXIDIZING MINERAL ACIDS	2. SULFURIC ACID	3. NITRIC ACID	4. ORGANIC ACIDS		6. AMMONIA	7. ALIPHATIC AMINES	8. ALKANOLAMINES	9. AROMATIC AMINES	10. AMIDES	11. ORGANIC ANHYDRIDES	12. ISOCYANATES	13. VINYL ACETATE	14. ACRYLATES	15. SUBSTITUTED ALLYLS	16. ALKYLENE OXIDES	17. EPICHLOROHYDRIN	18. KETONES	19. ALDEHYDES	20. ALCOHOLS, GLYCOLS	21. PHENOLS, CRESOLS	22. CAPROLACTAM SOLUTION	
30 OLEFINS		X	X																				30
31 PARAFFINS																							31
32 AROMATIC HYDROCARBONS			X																				32
33 MISCELLANEOUS HYDRO-CARBONS MIXTURES			X																				33
34 ESTERS		X	X																				34
35 VINYL HALIDES			X																			X	35
36 HALOGENATED HYDROCARBONS		G			H		I																36
37 NITRILES		X																					37
38 CARBON DISULFIDE							X	X															38
39 SULFOLANE																							39
40 GLYCOL ETHERS		X										X											40
41 ETHERS		X	X																				41
42 NITRO COMPOUNDS					X	X	X	X	X														42
43 MISCELLANEOUS WATER SOLUTIONS		X										X											43

Notes to compatibility chart: Letters A-I indicate additional reactivity hazards within a group. An "X" is not used if all members of the group do not share this reactivity hazard.

A. Acrolein (19), Crotonaldehyde (19), and 2-Ethyl-3-Propyl Acrolein (19) are not compatible with group 1, Nonoxidizing Mineral Acids.
B. Isophoronse(18) and Mesityl Oxide (18) are not compatible with group 8, Alkanolamines.
C. Acrylic Acid (4) is not compatible with group 9, Aromatic Amines.
D. Allyl Alcohol (15) is not compatible with group 12, Isocyanates.
E. Furfuryl Alcohol (20) is not compatible with group 1, Nonoxidizing Mineral Acids.
F. Furfuryl Alcohol (20) is not compatible with group 4, Organic Acids.
G. Dichloroethyl Ether (36) is not compatible with group 2, Sulfuric Acids.
H. Trichloroethylene (36) is not compatible with group 6, Caustics.
I. Ethylenediamine (7) is not compatible with Ethylene Dichloride (36).

Table 2
Alphabetical Listing of Chemical Compounds and Reactivity Groups

Name	Reactivity Group No.	Name	Reactivity Group No.
Acetaldehyde	19	Camphor oil (light}	18
Acetic acid	4	Caprolactam solution	22
Acetic anhydride	11	Carbolic oil	21
Acetone	18	Carbon disulfide	38
Acetonitrile	37	Carbon tetrachloride	36
Acrolein (inhibited}	19	Caustic potash solution	5
Acrylic acid (inhibited)	4	Caustic soda solution	5
Acrylonitrile (inhibited)	15	Chlorine	*
Adiponitrile	37	Chlorobenzene	36
Allyl alcohol	15	Chloroform	36
Allyl chloride	15	Chlorosulfonic acid	*
Aminoethylethanolamine	8	Corn syrup	43
Ammonia, anhydrous	6	Creosote, coal tar	21
Ammonium hydroxide (28% or less)	6	Cresols	21
Ammonium nitrate, urea, water		Cresylate spent caustic solution	5
solutions (containing ammonia)	6	Crotonaldehyde	19
Ammonium nitrate, urea, water		Cumene	32
solutions (not containing ammonia)	6	Cycloaliphatic resins	31
Amyl acetate	34	Cyclohexane	31
Amyl alcohol	20	Cyclohexanol	20
Amyl tallate	34	Cyclohexanone	18
Aniline	9	Cyclohexylamine	7
Asphalt	33	Cymene	32
Asphalt blending stocks		Decaldehyde	19
Roofers flux	33	Decane	31
Straight run residue	33	Decene	30
Benzene	32	Decyl alcohol	20
Benzene, toluene xylene (crude)	32	Decyl acrylate (inhibited)	14
Butadiene (inhibited)	30	Decylbenzene	32
Butane	31	Dextrose solution	43
Butyl acetate	34	Diacetone alcohol	20
Butyl acrylate (inhibited)	14	Dibutylamine	7
Butyl alcohol	20	Dibutyl phthalate	34
Butylamine	7	Dichlorobenzene	36
Butyl benzyl phthalate	34	Dichlorodifluoromethane	36
Butylene	30	1,1-Dichloroethane	36
1,3-Butylene glycol	20	Dichloroethyl ether	41
Butylene oxide	16	Dichloromethane	36
Butyl ether	41	1,1-Dichloropropane	36
Butyl methacrylate (inhibited)	14	1,2-Dichloropropane	36
Butyraldehyde	19	1,3-Dichloropropene	15
Butyric acid	4	Dicyclopentadiene	30

Table 2 (continued)
Alphabetical Listing of Chemical Compounds and Reactivity Groups

Name	Reactivity Group No.	Name	Reactivity Group No.
Diethanolamine	8	Hexane	31
Diethylamine	7	Hexanol	20
Diethylbenzene	32	Hexene	30
Diethylene glycol	40	Hexylene glycol	20
Diethylene glycol monobutyl ether	40	Hydrochloric acid	1
Diethylene glycol monobutyl ether		Hydrofluoric acid	1
acetate	34	Isophorone	18
Diethylene glycol monoethyl ether	40	Isoprene (inhibited)	30
Diethylene glycol monomethyl ether	40	Jet fuels: JP-I (kerosene), JP-3,	
Diethylenetriamine	7	JP-4, JP-5 (kerosene, heavy)	33
Diethylethanolamine	8	Kerosene	33
Diheptyl phthalate	34	Latex, liquid synthetic	43
Diisobutylene	30	Mesityl oxide	18
Diisobutyl carbinol	20	Methane	31
Diisobutyl ketone	18	Methyl acetate	34
Diisodecyl phthalate	34	Methyl acetylene, propadiene	
Diisopropanolamine	8	mixture (stabilized)	30
Ethyl methacrylate (inhibited)	14	Methyl acrylate (inhibited)	14
2-Ethyl-3-propyl acrolein	19	Methyl alcohol	20
Formaldehyde solution (37–50%)	19	Methyl amyl acetate	34
Formic acid	4	Methyl amyl alcohol	20
Furfural	19	Methyl bromide	36
Furfuryl alcohol	20	3-Methyl butyraldehyde	19
Gas oil		Methyl chloride	36
cracked	33	Methyl ethyl ketone	18
Gasoline blending stocks		Methyl formal (dimethyl formal)	41
Alkylates	33	Methyl isobutyl ketone	18
Reformates	33	Methyl isobutyl carbinol	20
Gasolines		Methyl methacrylate (inhibited)	14
Casinghead (natural)	33	(Alpha-)Methyl styrene (inhibited)	30
Automotive (containing over		Mineral spirits	33
4.23 g lead per gal)	33	Monochlorodifluoromethane	36
Aviation (containing not over		Morpholine	7
4.86 g lead per gal)	33	Motor fuel antiknock compounds	
Polymer	33	containing lead alkyls	*
Straight run	33	Naphtha: coal tar, solvent, Stoddard	
Glutaraldehyde solution	19	solvent, Varnish Markers',	
Glycerine	20	and Painters' (75%)	33
Glycol diacetate	34	Naphthalene (molten)	32
Glyoxal solution	19	Nitric acid (70% or less)	3
Heptane	31	Nitric acid (95%)	*
Hexamethylenediamine	7	Nitrobenzene	43

Table 2 (continued)
Alphabetical Listing of Chemical Compounds and Reactivity Groups

Name	Reactivity Group No.	Name	Reactivity Group No.
1- or 2-Nitropropane	43	Miscellaneous oils, including	
Nitrotoluene	43	Absorption	33
Nonane	31	Aromatic	33
Nonene	30	Coal tar	33
Nonyl alcohol	20	Heartcut distillate	33
Nonyl phenol	21	Linseed	33
Nonyl phenol (ethoxylated)	40	Lubricating	33
Octane	31	Mineral	33
Octene	30	Mineral seal	33
Octyl alcohol	20	Motor	33
Octyl aldehyde	19	Neatsfoot	33
Octyl epoxytallate	34	Penetrating	33
Oils		Range	33
Clarified	33	Resin	33
Coal	33	Resinous petroleum	33
Crude	33	Rosin	33
Diesel	33	Sperm	33
Edible oils		Spindle	33
Castor	34	Spray	33
Coconut	34	Tall	33
Cotton seed	34	Tanner's	33
Fish	34	Turbine	33
Lard	34	Oleum	*
Olive	34	Pentachloroethane	36
Palm	34	Pentadecanol	22
Peanut	34	Pentane	31
Safflower	34	Pentene	30
Soya bean	34	Pentyl aldehyde	19
Tucum	34	Perchloroethylene	36
Vegetable	34	Petrolatum	33
Fuel oils		Petroleum naphtha	33
Nos. I (kerosene), I-D, 2, 2-D,		Phenol	21
4, 5, 6	33	Phosphoric acid	1
Residual	33	Phosphorous	*
Road	33	Phthalic anhydride (molten)	11
Transformer	33	Polybutene	30

Table 2 (continued)
Alphabetical Listing of Chemical Compounds and Reactivity Groups

Name	Reactivity Group No.	Name	Reactivity Group No.
Polyethylene glycols	40	Tetradecanol	20
Polymethylene polyphenylisocyanate	12	Tetradecene	30
Polypropylene	30	Tetradecylbenzene	32
Polypropylene glycol methyl ether	40	Tetraethylenepentamine	7
Polypropylene glycols	40	Tetrahydrofuran	41
Propane	31	Tetrahydronaphthalene	32
Propanolamine	8	Tetrasodium salt of EDTA acid	43
Propionaldehyde	19	solution	32
Propionic acid	4	Toluene	12
Propionic anhydride	11	Toluene diisocyanate	36
Propyl acetate	34	1,2,4-Trichlorobenzene	36
Propyl alcohol	20	Trichloroethylene	20
Propylamine	7	Tridecanol	30
Propylene	30	Tridecene	32
Propylene butylene polymer	30	Tridecylbenzene	8
Propylene glycol	20	Triethanolamine	7
Propylene oxide	16	Triethylamine	32
Propylene tetramer	30	Triethyl benzene	40
Propyl ether	41	Triethylene glycol	7
Pyridine	9	Triethylenetetramine	40
Sodium hydrosulfide solution		Tripropylene glycol	30
(45% or less)	5	Turpentine	20
Sorbitol	20	Undecanol	30
Styrene (inhibited)	30	Undecene	32
Sulfolane	39	Undecylbenzene	19
Sulfur (molten)*		Valeraldehyde	13
Sulfuric acid	2	Vinyl acetate (inhibited)	35
Sulfuric acid, spent	2	Vinyl chloride (inhibited)	35
Tallow	34	Vinylidene chloride (inhibited)	30
Tallow fatty alcohol	20	Vinyl toluene (inhibited)	32
1,1,2,2-Tetrachloroethane	36	Xylene	

* Because of very high reactivity or unusual conditions of carriage, this product is not included in the compatibility chart.

Table 3
Reactivity Groups and Examples of Chemical Compounds Contained in Those Groups

Reactivity Group	Name
1.	Nonoxidizing mineral acids
	Hydrochloric acid
	Hydrofluoric acid
	Phosphoric acid
2.	Sulfuric acids
	Spent sulfuric acid
	Sulfuric acid (98% or less}
3.	Nitric acid
	Nitric acid (0% or less)
4.	Organic acids
	Acetic acid
	Butyric acid
	Formic acid
	Propionic acid
	Acrylic acid (inhibited)
5.	Caustics
	Caustic potash solution (KOH)
	Caustic soda solution (NaOH)
	Cresylate spent caustic solution
	Sodium hydrosulfide solution (45% or less)
6.	Ammonia
	Ammonia, anhydrous
	Ammonium hydroxide (28% or less)
	Ammonium nitrate, urea, water solutions (containing ammonia)
7.	Aliphatic amines
	Butylamine
	Cyclohexylamine
	Dibutylamine
	Diethylamine
	Diethyienetriamine
	Diisopropylamine
	Dimethylamine
7. (cont.)	Di-n-propylamine
	Ethylamine
	Ethylenediamine
	Hexamethylenediamine
	Methylamine
	Morpholine
	Propylamine
	Tetraethylenepentamine
	Triethylamine
	Triethylenetetramine
8.	Alkanolamines
	Aminoethylethanolamine
	Diethanolamine
	Diethylethanolamine
	Diisopropanolamine
	Dimethylethanolamine
	Ethanolamine
	Propanolamine
	Triethanolamine
9.	Aromatic amines
	Aniline
	Pyridine
	2-Methyl-S-ethylpyridine
10.	Amides
	Dimethylformamide
11.	Organic anhydrides
	Acetic anhydride
	Phthalic anhydride
	Propionic anhydride
12.	Isocyanates
	Diphenylmethane diisocyanate
	Polyphenyl polymethyleneisocyanate
	Toluene diisocyanate

Table 3 (continued)
Reactivity Groups and Examples of Chemical Compounds Contained in Those Groups

Reactivity Group	Name
13.	Vinyl acetate
	Vinyl acetate (inhibited}
14.	Acrylates
	Butyl acrylates
	Butyl methacrylate (inhibited}
	Decyl acrylate (inhibited}
	Ethyl acrylate (inhibited}
	2-Ethylhexyl acrylate (inhibited}
	Ethyl methacrylate (inhibited)
	Methyl acrylate (inhibited)
	Methyl methacrylate (inhibited)
15.	Substituted allyls
	Acrylonitrile (inhibited)
	Allyl alcohol
	Allyl chloride
	1,3-Dichloropropene
16.	Alkylene oxides
	Propylene oxide
	Butylene oxide
17.	Epichlorohydrin
18.	Ketones
	Acetone
	Camphor oil
	Cyclohexanone
	Diisobutyl ketone
	Isophorone
	Mesityl oxide
	Methyl ethyl ketone
	Methyl isobutyl ketone
19.	Aldehydes
	Acetaldehyde
	Acrolein (inhibited)
	Butyraldehyde
	Decaldehyde
	Ethylhexaldehyde
19. (cont.)	Formaldehyde
	Glutaraldehyde solution
	Glyoxal solution
	Methylbutyraldehyde
	Octyl aldehyde
	Pentyl aldehyde
	Propionaldehyde
	Valeraldehyde
20.	Alcohols, glycols
	Amyl alcohol
	Butyl alcohol
	1,3-Butylene glycol
	Cyclohexanol
	Decyl alcohol
	Diacetone alcohol
	Diisobutyl carbinal
	Dodecanol
	Ethanol
	Ethoxylated alcohols C11–C15
	Ethyl alcohol
	Ethylbutanol
	Ethylene chlorohydrin
	Ethylene cyanohydrin
	Ethylene glycol
	2-Ethyl hexanol
	Furfuryl alcohol
	Glycerin
	Hexanol
	Hexylene glycol
	Methanol
	Methyl alcohol
	Methyamyl alcohol
	Methylisobutyl carbinol
	Octyl alcohol
	Nonyl alcohol
	Pentadecanol
	Propyl alcohol
	Propylene glycol
	Sorbitol
	Tallow fatty alcohol

Table 3 (continued)
Reactivity Groups and Examples of Chemical Compounds Contained in Those Groups

Reactivity Group	Name
20. (cont.)	Tetradecanol
	Tridecanol
	Undecanol
21.	Phenols and cresols
	Carbolic oil
	Creosote, coal tar
	Cresols
	Nonyl phenol
	Phenol
22.	Caprolactam solution
23 to 29.	Unassigned
30.	Olefins
	Butadiene (inhibited}
	Butane
	Butylene
	Decene
	Dicyclopentadiene
	Diisobutylene
	Dodecene
	Ethylene
	Hexene
	Isoprene (inhibited)
	Methyl acetylene, propadiene mixture (stabilized)
	(Alpha-) Methyl styrene (inhibited)
	Nonene
	Octene
	Pentene
	Polybutene
	Polypropylene
	Propylene
	Propylene butylene polymer
	Propylene tetramer
	Styrene (inhibited)
	Tetradecene
	Tridecene
30. (cont.)	Turpentine
	Undecene
	Vinyl toluene (inhibited)
31.	Paraffins
	Butane
	Cycloaliphatic resins
	Cyclohexane
	Decane
	Dodecane
	Ethane
	Heptane
	Hexane
	Methane
	Nonane
	Octane
	Pentane
	Propane
32.	Aromatic hydrocarbons
	Benzene
	Benzene, toluene, xylene (crude)
	Cumene
	Cymene
	Decylbenzene
	Diethylbenzene
	Dodecylbenzene
	Ethylbenzene
	Naphthalene
	Tetradecylbenzene
	Tetrahydronaphthalene
	Toluene
	Tridecylbenzene
	Triethylbenzene
	Undecylbenzene
	Xylene
33.	Misc. hydrocarbon mixtures
	Asphalt
	Asphalt blending stocks

Table 3 (continued)
Reactivity Groups and Examples of Chemical Compounds Contained in Those Groups

Reactivity Group	Name
33. (cont.)	Diphenyl-diphenyl oxide
	Distillates
	Gas oil, cracked
	Gasoline blending stocks
	Gasolines
	Jet fuels
	Kerosene
	Mineral spirits
	Naphtha
	Oils, crude
	Oils, diesel
	Oils, coal
	Oils, fuel (No. 1 through No. 6)
	Oils, residual
	Oils, road
	Oils, transformers
	Petrolatum
	Petroleum naphtha
34.	Esters
	Amyl acetate
	Amyl tallate
	Buts acetate
	Butyl benzyl phthalate
	Castor oil
	Coconut oil
	Cottonseed oil
	Dibutyl phthalate
	Diethylene glycol monobutyl ether acetate
	Diheptyl phthalate
	Diisodecyl phthalate
	Dinonyl phthalate
	Dioctyl phthalate
	Diundecyl phthalate
	Ethyl acetate
	Ethylene glycol monobutyl ether acetate
	Ethylene glycol monoethyl ether acetate
34. (cont.)	Ethylhexyl tallate
	Fish oil
	Glycol diacetate
	Lard
	Methyl acetate
	Methyl amyl acetate
	Octyl epoxy tallate
	Olive oil
	Palm oil
	Peanut oil
	Propyl acetate
	Safflower oil
	Soybean oil
	Tallow
	Tucum oil
	Vegetable oil
35.	Vinyl halides
	Vinyl chloride (inhibited)
	Vinylidene chloride (inhibited)
36.	Halogenated hydrocarbons
	Carbon tetrachloride
	Chlorobenzene
	Chloroform
	Dichlorobenzene
	1,1-Dichloroethane
	Dichloroethyl ether
	Dichloromethane
	1,1-Dichloropropane
	1,2-Dichloropropane
	Ethyl chloride
	Ethylene dibromide
	Ethylene dichloride
	Methyl bromide
	Methyl chloride
	Pentachloroethane
	Perchloroethylene
	1,1,2,2-Tetrachloroethane

Table 3 (continued)
Reactivity Groups and Examples of Chemical Compounds Contained in Those Groups

Reactivity Group	Name
36. (cont.)	1.2,4-Trichlorobenzene
	Trichloroethylene
37.	Nitriles
	Acetonitrile
	Adiponitrile
38.	Carbon disulfide
39.	Sulfolane
40.	Glycol ethers
	Diethylene glycol
	Diethylene glycol monobutyl ether
	Diethylene glycol monoethyl ether
	Diethylene glycol monomethyl ether
	Dipropylene glycol
	Ethoxy triglycol
	Ethylene glycol monobutyl ether
	Ethylene glycol monoethyl ether
	Ethylene glycol monomethyl ether
	Nonylphenol, ethoxylated
	Polyethylene glycols
40.	Polypropylene glycols
	Polypropylene glycol methyl ether
	Soybean oil, epoxidized
	Tetraethylene glycol
	Triethylene glycol
	Tripropylene glycol
41.	Ethers
	Butyl ether
	1,4-Dioxane
	Ethyl ether
	Methyl formal (dimethyl formal}
	Propyl ether
	Tetrahydrofuran
42.	Nitrocompounds
	(mono-)nitrobenzene
	1- or 2-Nitrobenzene
	Nitrotoluene
43.	Miscellaneous water solutions
	Ammonium nitrate, urea, water solutions (not containing ammonia)
	Corn syrup
	Dextrose solution
	Latex solution
	Tetrasodium salt of EDTA solution

Appendix F

Appendix F

Documentations for Waste

- **Sampling and Analysis Worksheet**
- **Waste Evaluation Form**
- **Process Knowledge Evaluation Form**
- **Non-Routine Waste Process Evaluation Form**
- **Waste Parcel Card and Parcel Card Continuation Form**

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Sampling and Analysis Worksheet

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Sampling and Analysis Worksheet

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Sampling and Analysis Worksheet

Purpose

The Sampling and Analysis Worksheet (SAW) is used for waste certification purposes when there is insufficient generator knowledge or analytical information available to certify the waste. The SAW documents the specific sampling procedure and analysis that needs to be conducted to demonstrate compliance with *Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements*, NVO-325 (latest version). Attached is a sample of a Sampling and Analysis Worksheet.

SAMPLING AND ANALYSIS WORKSHEET

Worksheet Number ___

Section I. Process Knowledge Information: (To be completed by generator)

General Information: Attach additional sheets if necessary.

1. Waste generation location (Bldg. / Room or Area) _____
   Current location of waste if different from above _____
2. Description of waste (Example: soil, gravel, filters, solidified waste oil):
   _____
   _____
3. Describe process / activity that generated the waste (Examples: test drilling, core sampling):
   _____

❒ This waste is from the treatment facility, the process conducted for the final waste form is
❒ Solidification, ❒ Encapsulation, ❒ Other (explain) _____
❒ List of original disposal requisitions attached.

4. Procedures used when generating the waste: _____
5. List and attach any additional supporting information (e.g. existing analytical data, investigative reports):
   _____
   _____
6. Program / organization that generated the waste:
   _____
7. Quantity of waste: Weight _____ No. of Drums _____ No. of Boxes _____
8. Container type (if already packaged): ❒ 55 gallon drum, ❒ 30 gallon drum, ❒ 4x4x7 box, ❒ 2x4x7 box
   ❒ Other _____

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SAMPLING AND ANALYSIS WORKSHEET

Waste Evaluation:

9. Does the waste contain any of the following:

   Verified by: *VI=Visual Inspection; PK=Process Knowledge*

   a. Grease / oil ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   b. Hazardous residues ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

      If yes, what are the residues _____

   c. Entrapped liquids ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

      If yes, is it less than 0.5% by volume of the waste? ❒ Yes ❒ No

      What is the liquid? _____

   d. Particulates [> 1% by weight of < 10-micrometer diameter (flour) or > 15% by weight of < 200-micrometer diameter (sand)] ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   e. Compressed gases ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   f. Etiologic agents ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   g. Chelating agents ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

      If yes, is the concentration less than 1% by weight? ❒ Yes ❒ No

   h. PCBs (capacitors, etc.) ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   i. Explosives ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   j. Pyrophorics ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

   k. Asbestos ❒ Yes ❒ No ❒ Unknown ❒ VI ❒ PK

      If yes, is it ❒ friable ❒ non-friable. If friable, please segregate.

SAMPLING AND ANALYSIS WORKSHEET

Section I. continued

Radiological Characterization

10. Radionuclides present in the waste and the estimated activity for each nuclide: ❒ Unknown

Radionuclide	Activity (Ci)	Radionuclide	Activity (Ci)
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

❒ See attached sheet ❒ The above and ❒ attached nuclides are the suspect nuclides, activity unknown.

11. Determination of radionuclides: ❒ Unknown

❒ Process Knowledge: Explain: (Example: Inventory Controls) _____

_____

12. Determination of Activity: ❒ Unknown

❒ Gamma Spectroscopy
❒ Mass Balance
❒ High Sensitivity Neutron Instrument
❒ ISAM Method
❒ Liquid Scintillation
❒ Alpha Spectrometry
❒ Mass-to-Curie Conversion
❒ Tritium Off-Gas Measurement
❒ Other (explain) _____

_____

List procedure(s) followed: _____

❒ DPM or CPM to Curie Survey: Instrument _____ Probe _____

Attach memo describing methodology used.

Completed by (please print) _____ Extension _____

Signature _____ Date _____

SAMPLING AND ANALYSIS WORKSHEET

Worksheet Number ___

Section II. Sampling (To be completed by QA/QC Technical Lead)

1. Person / organization responsible for sampling: _____

   Responsible person has been trained. ❒ Yes ❒ No

2. Analytical Methods

   Check all methods that the waste must be analyzed by:

❒ Volatiles 8260 (TCLP ZHE 1311)	❒ Gross alpha beta	❒ Other: _____
❒ Semivolatiles 8270	❒ Alpha Spectrometry	❒ _____
❒ STLC Metals (including Hg)	❒ Gamma Spectroscopy	❒ _____
❒ PCBs 8080	❒ Tritium	❒ _____

Name and address of Laboratory to be used: _____

_____

Completed by: Print Signature Date

Section III. Sampling Frequency and Selection (To be completed by QA/QC Technical Lead)

_____

Completed by: Print Signature Date

Section IV. Sampling Strategy (To be completed by QA/QC Technical Lead)

_____

Completed by: Print Signature Date

Section V. Sampling Methodology (To be completed by QA/QC Technical Lead)

_____

Completed by: Print Signature Date

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Waste Evaluation Form

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LAWRENCE LIVERMORE NATIONAL LABORATORY

Waste Evaluation Form

WEF No. _____ Rev. ____

PLEASE PRINT — USE BLACK, INDELIBLE INK

1. General Information

RMMA ☐ YES ☐ NO

Process Generating Waste

_____

_____

_____

_____

_____

_____

_____

_____

_____

Waste Stream Characteristics

Waste Form: (Mark only one) ☐ Solid ☐ Liquid ☐ Gas

☐ Sludge-Liquid Vol. % (Must state on req.) _____

Waste Type: (Mark only one) ☐ Haz ☐ Non-Haz

☐ Low Level ☐ Low Level Mixed

pH Range ☐ ≤ 2 ☐ > 2 < 12.5 ☐ ≥ 12.5 ☐ N/A

Flashpoint _____°C

Physical Waste Description:

_____

_____

_____

_____

_____

_____

_____

_____

_____

1. *(Cont.)* Waste Constituents/Chemical Components

Information Source # (Mark one per constituent)

1. Process/generator knowledge
2. Field analysis/verification
3. Environmental analyst determination letter
4. Lab analysis /No. _____ _____ _____ _____
5. Pollution prevention opportunity assessment
6. Procedures; specify _____
7. MSDS

Constituent	Quantity Range	Unit *	Info Source	(x) Haz Constituents
a.				
b.				
c.				
d.				
e.				
f.				
g.				
h.				
i.				

Have alternative processes/solvents been considered? ☐ YES ☐ NO

* Vol. % mg/l
Wt. % mg/kg

2. Coding Information

FOR HWM USE ONLY

EPA Codes_____

DTSC Codes_____

Form Code_____ Origin Code_____ Compatibility Code_____

RCH Prefix_____ RCH_____ Drug precursor Code_____

Hazardous Properties: ☐ Corrosive ☐ Ignitable ☐ Toxic ☐ Reactive

Potential SCIL ISSUE ☐ Yes ☐ No

CC Rule:
<500 PPMW VO concentration ☐
≥500 PPMW VO concentration ☐

Determined by:
Process knowledge ☐
Test data ☐

Is waste approved for accumulation? ☐ Yes ☐ No

Is waste acceptable in HWM permitted facilities? ☐ Yes ☐ No

Is waste acceptable for 361CWAA? ☐ Yes ☐ No

WDR must be reviewed prior to transport to the WAA ☐ Yes ☐ No

Comments:

_____

_____

_____

Chemist _____ _____
Signature Date Employee #

3. Packaging/Shipping Information

FOR HWM USE ONLY

Container Type _____ Size _____ Disposal Office Profile No. _____

Packaging Instructions:

_____

_____

_____

_____

_____

_____

Shipping Coordinator _____ _____
Signature Date Employee #

Waste Evaluation Form
Instructions

Reason for Submittal: WEF forms are used to characterize new waste streams, describe changes in waste streams, and identify routine waste streams.

General Information

Generator Name: Fill in the name and phone number of person responsible for generating waste stream.

Directorate: Fill in the appropriate three-letter abbreviation representing the directorate that generated the waste. If unknown, contact the Program Manager for correct directorate abbreviation.

Building and Room: Fill in location where waste is generated.

RMMA: Indicate whether waste is from a Radioactive Materials Management Area (RMMA), an area where radioactive materials are present. If in doubt, call the Health and Safety Technician.

Routine: Normal operations waste is waste produced from any type of production operation, analytical and/or R&D laboratory operation, "work for others," or any other periodic and *recurring* work considered *ongoing* in nature. "Normal operations" refers to the type of ongoing process (e.g., production, R&D, etc..), NOT to the specific activity that produced the waste. If waste is routine, give an estimate of amount periodically generated.

Process Generating Waste

Enter the generator's description of the process generating the waste. For example, see LLNL waste source codes contained in the Waste Acceptance Criteria. (Note: that all codes ending in "2" are nonroutine.)

Waste Stream Characteristics

Waste Form: Check the box that describes the physical form of the waste. (Note: for sludge waste, estimate the range of liquid to solid ratio.)

Waste Type: Specify waste type. (Mark only *one* box.)

Physical Waste Description: Enter the generator's description of the waste (e.g., vacuum pump oil, lab debris, aqueous photochemical solutions, spray paint aerosol cans, Trimsol coolant wash water, mixed solvents, equipment and fixtures, HEPA filters, Safety Kleen 105). Enter one of the following eight generic waste descriptions:

- – organic liquids (≥10%organics)
- – organic solids (≥10% organics
- – organic sludges (≥10%organics)
- – organic gas (≥10% organics)
- – inorganic liquids (<10% organics)
- – inorganic solids (<10% organics)
- – inorganic sludges (<10% organics)
- – inorganics gas (<10% organics)

Enter the waste's matrix and percentage (e.g., 50% stainless steel and 15% glass; 90% water; 90-100% wood; 50% paper, 25% plastic and 10% sand; or 100% asbestos. More than one material may be needed to describe a waste's matrix.

Notes:

1. For equipment and fixtures (i.e., wood pallets, tools, ballast, and tables), give dimensions (length, width, height); for structural components, specify material (e.g., metal, wood, plastic, glass).

2. For HEPA filters, identify separator makeup (e.g., asbestos, aluminum, plastic).

3. For waste containing solid metal parts greater than 6" in any dimension, all dimensions must be provided.

Hazardous Constituents/Chemical Compounds

List components that make the waste hazardous and their concentrations. (Do not use chemical structures or formulas.)

Notes:

1. For waste containing Hg, specify the amount less than 260mg/l (0.1% = 1000mg/l).

2. For acids or bases, indicate normality (if known).

Information Source: Enter a source identification number (from the provided list of seven) for each constituent entered.

Source Code: Copy code from the list provided in the WDR

WEF No. _____ Rev. ____

Continuation Sheet

Constituent	Quantity Range	Unit *	Info Source	(x) Haz Constituents
j.				
k				
l.				
m				
n.				
o.				
p.				
q.				
r.				
s.				
t.				
u.				
v.				
w				
x.				
y				

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Waste Evaluation Form

WEF No. _____

PLEASE PRINT — USE BLACK, INDELIBLE INK

1. Radiological Supplement

Information Source #

1. Gamma spectroscopy*
2. Mass balance
3. High sensitivity neutron instrument*
4. AVLIS methods
5. Liquid scintillation*
6. Alpha spectroscopy*
7. Mass to curie conversion
8. Tritium off gas measurement
9. Dose to Curie

*Sample #'s _____

Attach analytical results.

Radionuclides	Range	Unit **	Information Source
a.			
b.			
c.			
d.			
e.			
f.			
g.			
h.			
i.			
j.			
k			
l			
m.			
n.			
o.			
p.			

**** Curies or Grams**

2.) RCA Review

Procedure 800 Review

Tritium < 1,000 ci	☐ Yes	☐ No	If no, RCA WDR review required
Alpha Curie < 6 ci	☐ Yes	☐ No	If no, RCA WDR review required
Fissile Grams < 10 gram	☐ Yes	☐ No	If no, RCA WDR review required

☐ Container may contain more than 1 curie and more than the amount identified per radionuclide on Attachment B of HWM 800.

☐ Eligible for decay in storage program in accordance with AP 157.

TSDF Profile # _____

☐ Isotopes meet TSDF WAC

☐ Concentration averaging required

Comments _____

_____ _____

RCA Approval Date

WEF No. _____ Rev. ____

Continuation Sheet

Constituent	Quantity Range	Unit	Info Source
j.			
k.			
l.			
m.			
n.			
o.			
p.			
q.			
r.			

WEF Usage Card

Reason for Submittal: ☐ New Waste Stream ☐ Revision ☐ Cancellation ☐ Add new generator to WEF No._____

1. General Information

Generator Name _____ Ph. _____

Directorate _____ Bldg. _____ Rm. No. _____ RMMA ☐ YES ☐ N O

Routine ☐ YES ☐ N O

Estimated rate of generation (lb, gal, cu ft, per month or qtr) _____

Generator _____ _____
Signature Employee #
Date

Field Tech _____ _____
Signature Date Employee #

Chemist approval _____ _____
Signature Date Employee #

☐ N / A RCA approval _____ _____
Signature Date Employee #

WCP 0122

Process Knowledge Evaluation Form

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PROCESS KNOWLEDGE EVALUATION PKE No. _____

RCA Initial Here: _____

LAST DATE UPDATED: _____

SECTION I: PROCESS INFORMATION (To be completed by Lead Experimenter/Room Responsible Person/Project Supervisor)

1. Building: _____ 2. Room: _____ 3. Workstation: _____

4. Briefly describe the process(es) in this area that contribute to this waste stream:

_____

_____

_____

_____

_____

5. Estimated annual volume: _____ 6. Projected termination date of project (If known): _____

7. Are process procedure/instructions utilized? ❒ Yes ❒ No

If yes, please list and attach the primary procedure: _____

_____

8. Are any regulated RCRA or California-listed hazardous materials a part of used in or created by these processes? ❒ Yes ❒ No

If Yes, please list, explain how they are used, and assure that the OSP or other procedure which describes their use is listed in item 7. _____

_____

9. If present, how are regulated hazardous materials controlled to prevent them from commingling with or contaminating radioactive waste? _____

_____

10. Will the waste resulting form the process described in item 5 have any of the following waste acceptance attributes?

ASBESTOS (FRIABLE)	❒ Yes	❒ No	EXPLOSIVE	❒ Yes	❒ No
(NON-FRIABLE)	❒ Yes	❒ No	FINE PARTICLES ABOVE		
CHELATING AGENTS	❒ Yes	❒ No	ALLOWABLE LIMITS*	❒ Yes	❒ No
CLASSIFIED	❒ Yes	❒ No	FREE LIQUIDS	❒ Yes	❒ No
COMPRESSED GASES	❒ Yes	❒ No	PCBs	❒ Yes	❒ No
ETIOLOGICAL	❒ Yes	❒ No	PYROPHORIC	❒ Yes	❒ No

12. Will the resulting waste exhibit any of the following characteristics?

CORROSIVES	❒ Yes	❒ No	IGNITABLE	❒ Yes	❒ No
TOXIC	❒ Yes	❒ No	REACTIVE	❒ Yes	❒ No

*Allowable limits: >1% by weight of particles <10µm diameter or > 15% by weight of particles <200µm diameter.

NOTE: If any of the items in 11 or 12 above are marked YES, explain in item 9 above, how the waste will be segregated. Non-friable Asbestos and Classified Waste are accptable waste items to be shipped to the NTS.

13. Will any resulting waste contain listed hazardous material? (use list in EP0006 training manual) ❒ Yes ❒ No

14. Check all grades of Uranium or Plutonium present:

Depleted Uranium (U-235 < 0.7%)	❒ Yes	❒ No	Weapons Pu (Pu-240 ≤ 6.0% + Am-241 ≤ 1.0%)	❒ Yes	❒ No
Natural Uranium (U-235 = 0.7%)	❒ Yes	❒ No	Fuel Pu (6.0% < Pu-240 ≤ 12.0% + Am-241 ≤ 1.0%)	❒ Yes	❒ No
Low Enrichment Uranium	❒ Yes	❒ No	Reactor Pu (12.0% < Pu-240 ≤ 25.0% + Am-241 ≤ 1.0%)	❒ Yes	❒ No
			Am-Enriched Pu (Pu-240 ≤ 15.0% + 1.0% Am-241 ≤ 25.0%)	❒ Yes	❒ No
			Mixed Pu (15.0% < Pu-240 ≤ 50.0% + 1.0% < Am-241 ≤ 25.0%)	❒ Yes	❒ No

15. List all other radionuclides present in the waste stream:

_____

Attach a memo or procedure documenting the methodology that well be used to identify and quantify the radionuclides in the waste. Examples: Scintillation counting, mass balance

16. Mark all of the regulated waste types produced:

❒ LLW ❒ TRU ❒ Hazardous*

❒ LLW RCRA Mixed* ❒ TRU RCRA Mixed ❒ Biohazardous*

❒ LLW + CA Hazardous* ❒ TRU CA Hazardous

*Complete a Waste Evaluation Form (WEF) (Contact your HWM Field Technician)

17. List all components of waste generated by the process being evaluated. Indicate any that may contain hazardous materials. See attached list ❒

_____

_____

_____

_____

_____

18. Comments: _____

_____

_____

_____

19. _____ _____

Lead Experimenter/Room Responsible Person/Project Supervisor Date

NOTE: When processes are significantly changed, this form must be re-evaluated and revised as necessary.

SECTION II: ENVIRONMENTAL REVIEW (To be completed by an Environmental Analyst)

20. Visually examine chemical stocks in the area. Are any of the following categories of materials present?

SOLVENTS	❒ Yes	❒ No	ORGANICS	❒ Yes	❒ No
PYROPHORICS	❒ Yes	❒ No	METALS	❒ Yes	❒ No
EXPLOSIVES	❒ Yes	❒ No	CORROSIVES	❒ Yes	❒ No

If any of the above blocks are marked yes, evaluate controls described on applicable Waste Stream Evaluation form.

21. Process procedure evaluation completed? ❒ Yes ❒ No

21.1 If yes, please list procedure(s):_____

22. Additional available information to support Process Knowledge:_____

_____

23. The following regulated waste types are produced:

❒ LLW ❒ TRU ❒ Hazardous

❒ LLW RCRA Mixed ❒ TRU RCRA Mixed ❒ Biohazardous

❒ LLW + CA Hazardous ❒ TRU CA Hazardous

24. Comments:_____

_____

25. _____ _____

Environmental Analyst Date

SECTION III: REVIEW SIGNATURES

I have reviewed Sections I and II and found them to be complete and accurate. I have also reviewed the controls on hazardous materials and found them acceptable.

26. _____ _____

Waste Certification Official Date

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Non-Routine Waste Process Evaluation Form

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NON-ROUTINE WASTE
PROCESS KNOWLEDGE EVALUATION FORM

PKE Number _____ Waste Stream Number: BCLA-_____

Waste Disposal Requisition Number(s) or Parcel Card Number(s): _____

Section I: To be completed by generator

General Information: ❒ Sealed Source(s), ❒ Lab Trash, ❒ Equipment, ❒ Classified Waste, ❒ Empty Container

1. Building and room of waste generation: _____ ❒ See attached spreadsheet
2. Description of waste, include serial #'s for equipment, LLNL ID #'s for sealed sources: (Example: Kimwipes, glass beakers, plastic bags, rubber gloves, glovebox made of stainless steel & poly, 5 gallon metal container which last contained uranium bars): ❒ See attached requisitions
   ❒ See attached spreadsheet (a spreadsheet may be used for multiple items)
   _____
   _____
   _____
3. Weight of material per item or parcel (Example: Lab trash parcel - 30 pounds; glovebox - 100 pounds; 3 wood boxes - 25 pounds each): ❒ See attached spreadsheet
   _____
4. Describe process/activity that generated the waste or operational use for equipment (Example: Decon on glovebox that was used to digest rock samples): _____
   _____
   _____
   _____

Items 5 - 7 is for equipment and sealed sources only: ❒ Not Applicable

5. Procedures used when generating the waste or involved in the use of the equipment: _____
   _____
6. Approximate age of the equipment or sealed source(s): _____
7. The following documentation is attached (Provide the following supporting information, if available):
   ❒ Procurement Documentation, ❒ Statement of Work, ❒ Drawings, ❒ Specifications

Items 8 - 10 are for sealed sources only: ❒ Not Applicable

8. Source verification documentation for each sealed source: (Must have 2 of the following, check the ones that are attached) ❒ Materials Management sealed source inventory printout; ❒ Copy of the NIST Certification for the source; ❒ Photographs; ❒ A memo describing how the identity of the source was determined and verified; ❒ Gamma Spec.
9. Are the sources shielded? ❒ Yes ❒ No ❒ Some are (list which sources are shielded)_____
   _____
   a. Is the source lead shielded? ❒ Yes ❒ No
   b. If no, what is the shielding material? _____
10. Is the source leaking? ❒ Yes ❒ No, If yes, explain additional packaging requirements.
   _____

Items 11 - 12 are for classified waste only: ❒ Not Applicable

11. List the drawing #s and LLNL Inventory #s of the waste items: _____
   _____ ❒ See attached spreadsheet
12. Classification is due to ❒ Shape, ❒ Composition, ❒ Other:_____
   Level of classification (e.g., SRD, CRD): _____
   Location of supporting information: _____
   Special instructions to protect classified information: _____
   _____

NON-ROUTINE WASTE PROCESS KNOWLEDGE EVALUATION FORM

PKE Number _____

Waste Evaluation:

5. Does the waste contain any of the following:

Verified by: *VI=Visual Inspection; S&A=Sampling and Analysis; PK=Process Knowledge,* ***When PK is checked, it must be supported by Visual Inspection (VI) or an explanation must be documented. (Example: Inventory controls, none used in process, or reference supporting documentation, if not already described above, (e.g., logbooks, drawings).***

a. Grease / oil ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

b. Hazardous residues ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

If yes, what are the residues _____

c. Entrapped Liquids ❒ Yes ❒ No ❒ VI ❒ PK _____

If yes, is it less than 0.5% by volume of the waste? ❒ Yes ❒ No

What is the liquid? _____

d. Particulates [> 1% by weight of < 10-micrometer diameter (flour) or > 15% by weight of < 200-micrometer diameter (sand)] ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

e. Compressed gases ❒ Yes ❒ No ❒ VI ❒ PK _____

f. Etiological agents ❒ Yes ❒ No ❒ S&A ❒ PK _____

g. Chelating agents ❒ Yes ❒ No ❒ S&A ❒ PK _____

If yes, is the concentration less than 1% by weight? ❒ Yes ❒ No

h. PCBs (capacitors, etc.) ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

i. Explosives ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

j. Pyrophorics ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

k. Asbestos ❒ Yes ❒ No ❒ VI ❒ S&A ❒ PK _____

If yes, is it ❒ friable ❒ non-friable. If friable, please segregate.

l. Batteries ❒ Yes ❒ No ❒ VI ❒ PK _____

When Sampling and Analysis is used, attach results.

Radiological Characterization: ***There must be information available to support the below information. All determinations must be reproducible.***

6. Radionuclides present in the waste, per item or parcel, and the activity for each nuclide:

Radionuclide	Activity (Ci)	Radionuclide	Activity (Ci)
_____	_____	_____	_____
_____	_____	_____	_____

❒ See attached sheet

Radiological Characterization

7. Determination of radionuclides:

❒ Process Knowledge: Explain: (Example: Inventory Controls) _____

_____

❒ Radioanalysis (attach results) ❒ Radiological swipe (attach results)

❒ Gamma Spectroscopy (attach results) ❒ Alpha Spectroscopy (attach results)

8. Determination of Activity: ***Except for AVLIS Method, documentation must be attached describing all calculations and assumptions used to obtain the activity values.***

❒ Gamma Spectroscopy ❒ Alpha Spectroscopy

❒ Mass Balance ❒ Mass to Curie Conversion

❒ High Sensitivity Neutron Instrument ❒ Tritium Off Gas Measurement

❒ AVLIS Method ❒ Other (explain) _____

❒ Liquid Scintillation _____

List procedure(s) followed: _____

❒ DPM or CPM to Curie Survey: Instrument _____ Probe _____

Attach memo describing methodology used.

Generator (please print) _____ extension _____

Signature _____ Date _____

Section II. HWM REVIEW AND VALIDATION

1. The waste matches the description above. ❒ Yes ❒ No
2. Section I is complete. ❒ Yes ❒ No

_____

Completed by: Print Signature Date

Section III. ENVIRONMENTAL ANALYST REVIEW

When the generator is using process knowledge to characterize his waste the EA should review the supporting documentation. If no documentation is reviewed, explain why, (e.g., visually examined the waste, documented any interviews with the generator).

1. Based on the information provided on this PKE Form, the waste is free of regulated hazardous materials. ❒ Yes ❒ No
2. List the documentation that was reviewed to support the characterization of this waste stream.

   _____

   _____

   ❒ See attached list of additional support documentation that was reviewed.

   ❒ Waste characterization memo attached.

   ❒ No documentation was reviewed: Explain why: _____

   _____

_____

EA Print Signature Date

Section IV. HEALTH PHYSICIST REVIEW

1. Based on the information provided on this PKE Form, the waste has been properly characterized as to its radiological content. ❒ Yes ❒ No ❒ See attached memo for additional information.
2. The anticipated range of error associated with the method described in Section I, 8 is _____.
3. Method is reproducible. ❒ Yes ❒ No Method is representative. ❒ Yes ❒ No

_____

HP Print Signature Date

Section V. WASTE CERTIFICATION ENGINEER REVIEW

General Review:

1. Sections I, II, III, and IV have been completed by qualified personnel.
2. ❒ The above sections are properly completed.
3. NCAR Issued, ❒ Yes ❒ No NCAR Number _____
4. Surveillance conducted: ❒ Yes Surveillance Number: _____

Radiological Characterization:

1. The radionuclides described above are identified on the Waste Stream Profile and are within the ranges listed. ❒ Yes ❒ NA (Waste is not destined for NTS)
2. Are the quantity and type of radionuclides present sufficient to generate nuclear heating? ❒ Yes ❒ No, If yes, list expected wattage. _____

_____

WCE Print Signature Date

Section VI. WASTE CERTIFICATION OFFICIAL REVIEW

1. The waste is acceptable to be packaged for shipment to ❒ NTS ❒ Hanford ❒ Envirocare.
2. Package the waste in accordance with:
   - ❒ Packaging Instructions Number: _____
   - ❒ Facility Specific Handling and Packaging Procedure: _____

_____ _____

WCO Print Signature Date

Waste Parcel Card and Parcel Card Continuation Form

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LLNL RADIOACTIVE WASTE
PARCEL CARD

INSTRUCTIONS ON BACK

P

1. Radioactive and Hazardous Waste Categories:
❒ LL ❒ TRU ❒ Radioactive only ❒ Mixed (RCRA)

2. Building:

3. Room / Workstation: /

4. Account No.: __ __ __ __-__ __

5. Requisition Number W __ __ __ __ __ __

6. Parcel Date: ___ / ___ / ___

7. Directorate: ___ ___ ___

8. PKE #

ITEM 9 FOR LLW ONLY:
9. Sample Analysis No.:

10. Physical Form of Waste:
❒ Solid ❒ Sludge ❒ Liquid ❒ Gas

11. Waste Generating Procedure:
Procedure #: ❒ 332 FSP ❒ TIP-HEF-007 ❒ TIP-HEF-008
❒ AVLIS HPP ❒ EX-404 ❒ ______________
❒ SAP #: __________________ ❒ Instruction #: _________
Explanations:

12. Will the final waste form contain any of the following? (Explain all "yes" answers at lower left.)
- Classified Material: ❒ Yes ❒ No
- Free Liquids: ❒ Yes ❒ No
- Fine Particles: ❒ Yes ❒ No
  [> 1% of <10-micrometer particles (compare to flour) or >15% of <200-micrometer particles (compare to sand)]
- Compressed Gases: ❒ Yes ❒ No
  (e.g., non-punctured aerosol cans)
- Explosives: ❒ Yes ❒ No
  (e.g., TNT, PETN, HMX, that exhibit explosive properties)
- Pyrophorics: ❒ Yes ❒ No
  (e.g., uranium turnings that could spontaneously combust if exposed to air)
- Ignitable Material: ❒ Yes ❒ No
- Corrosive Material: ❒ Yes ❒ No
- Reactive Material: ❒ Yes ❒ No
- Chelating Agents: ❒ Yes ❒ No
  (e.g., Radiac Wash, > 1% by weight / pkg)
- Friable Asbestos: ❒ Yes ❒ No
- PCBs: ❒ Yes ❒ No

13. Physical Description and Inventory of Waste:

❒ See continuation form. ❒ See attached fill record.
❒ Description and hazardous constituents on attached checklist.

14. Hazardous Constituents:
❒ Yes: (❒ RCRA ❒ CA) ❒ No (list)

Constituent	Amount	Units (g,l)

15. *HWM ONLY*
EPA/CA Hazardous:

Waste Code	*Form Code*

16. Method(s) used to identify radionuclides and/or determine activity:
- ❒ Process knowledge
- ❒ Mass
- ❒ Mass balance
- ❒ Alpha spectrometry of sample
- ❒ Gamma spectrometry of sample
- ❒ Gamma spectrometry of parcel
- ❒ AVLIS method (❒ A ❒ B ❒ C)
- ❒ Liquid scintillation counting
- ❒ Other (describe at right)

17. Radionuclides in this Parcel: (Check all that apply.)
- ❒ Weapons Pu (Pu-240 ≤ 6% + Am-241 ≤ 1%)
- ❒ Fuel Pu (6% < Pu-240 ≤ 12% + Am-241 ≤ 1%)
- ❒ Reactor Pu (12% < Pu-240 ≤ 25% + Am-241 ≤ 1%)
- ❒ Am-Enriched Pu (Pu-240 ≤ 15% + 1% < Am-241 ≤ 25%)
- ❒ Mixed Pu (15% < Pu-240 < 50% + 1% < Am-241 < 25%)

	Amount	Units (g,Ci)
❒ Depleted Uranium (U-235 < 0.7%)		
❒ Natural Uranium (U-235 = 0.7%)		
❒ Enriched Uranium (_____% U-234 _____% U-235 _____% U-238)		

❒ Other Radionuclides (list)

Nuclide	Amount	Units (g,Ci)	Nuclide	Amount	Units (g,Ci)

ITEMS 18 - 21 FOR TRUW ONLY:

18. LLNL TRU Waste Form(s):
Check all that apply:
- ❒ 1. Glove Box Waste
- • Solidified Liquid Waste:
- ❒ 2a. Oils or solvents present
- ❒ 2b. Aqueous only
- ❒ 3. Metal Scrap Waste
- • Waste Salt Blocks:
- ❒ 4a. Trace organics present
- ❒ 4b. Organics absent
- ❒ 5. HEPA Filters

19. Estimated Waste Materials Parameter Weights:

Weight	Units (g,lb)	
		Iron-based Metals/Alloys
		Aluminum-based Metals/Alloys
		Other Metals/Alloys
		Other Inorganic Materials
		Cellulosics
		Vitrified
		Rubber
		Plastics (waste materials)
		Solidified, Inorganic Matrix
		Cement (Solidified)
		Solidified, Organic Matrix
		Soils

20. TRU Waste Container Serial Number:
LL85 __ __ __ __ __ __ TRU

21. Parcel Packaging:
Parcel has the following number of gas confinement layers (e.g., taped plastic bags): ❒ 2 ❒ ____

ITEMS 22 - 25 FOR LLW ONLY:

22. Radiation Survey Information
(Complete when a survey instrument is used to determine activity)

Prior to survey: Check source jig no. ______
Detector response (±30%) ❒ Satisfactory
Survey meter model: __________________
Serial number: __________________
Calibration due date: __________________

Average radiation survey meter reading at the parcel's six surfaces (top, bottom, left side, right side, front and back) ______________
(Specify amount and units)
(e.g., dpm, cpm, mR/hr)
[cpm may only be used in conjunction with an authorized procedure (e.g., AVLIS survey methods).]

Surveyed by: ______________ Name ______________ Date

Post-use: Check source jig no. _________
Detector response (±30%)
❒ Satisfactory ❒ Unsatisfactory

Note: If response is unsatisfactory, resurvey with a meter that meets the ±30% criterion.

23. Solidification Checklist Attached:
❒ Yes ❒ N/A

Note: If AVLIS Method C is used, use a calibrated scale.

24. Total Parcel Weight (g, lb):
____________________ ________ Units

❒ Scale: Serial #: ______________
Calibration due date: __________
❒ Estimated weight

25. Waste Package Seal No.:

Date WPS Applied:

26. Generator Certification: I certify that this waste parcel contains only the waste identified on this card and that, to the best of my knowledge, its characterization is complete and accurate.

Generator Name (Print):	Date:	Ext.:
Signature:	**Employee No.:**	**L-Code:**

27. Verifier Certification: I verify that, to the best of my knowledge, the information supplied by the waste generator on this card is complete and accurate.

Verifier Name (Print):	Verification Date:	Date Verifier Authorization Expires:
Signature:	**Employee No.:**	

28. *Waste Cert. Eng. Review:*
________ Initials ________ Date

29. *HWM Chemist Review:*
________ Initials ________ Date

WCP 0093 (04/04/96)

CORRECTIONS: DRAW ONE LINE THROUGH THE MISTAKE, CORRECT IT, INITIAL, AND DATE.

NOTE: You may use metric multiples of indicated metric units.

LLNL RADIOACTIVE WASTE

PARCEL CARD CONTINUATION FORM

Parcel Card No.: **P** __ __ __ __ __ __

Requisition No.: **W** __ __ __ __ __ __

Date: _____

Page ____ ***of*** _____

13. Physical Description and Inventory of Waste:

14. Hazardous Constituents:

Constituent	Amount	Unit (g,l)

17. Radionuclides in this Parcel:

Nuclide	Amount	Units (g,Ci)

Other Continued Items (list):

WCP 0101 (03/28/96)

Verifier's Initials: _____ **Date:** _____

Appendix G

Appendix G

Toxic Air Contaminants

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Toxic Air Contaminants

acetaldehyde
acetone
acrolein
acrylamide
acrylonnitrile
amonia
arsenic and arsenic compounds
asbestos
benzene
benzidine and salts
benzyl chloroide
bis (chlormethyl) ether
bromine and compounds
1,3-butadiene
butyl alcohol, tert-
cadmium and cadmium compounds
carbon disulfide
carbon tetrachloride
chlorinated dibenzodioxins and
    dibenzofurans (TCDD and TCDF)
chlorine
chlorobenzene
chlorofluorocarbons
chloroform
chloropicrin
chloroprene
chlorotoluene
chromium (hexavalent)
cresol
1,4-dichlorobenzene
3,3'-dichlorobenzidine
diethylaminoethanol
diethylhexylphthalate (DEHP)
dimethyl phthalate
dimethylamine
dioctyl phthalate
1,4-dioxane
epichlorohydrin
ethyl acetate
ethyl alcohol (ethanol)
ethyl chloride
ethylbenzene
ethylene dibromide
    (1,2-dibromoethane)
ethylene dichloride
    (1,2-dichloroethane)
ethylene oxide
formaldehyde
freaons
glycol ethers:
    2-ethoxyethanol
    (cellosolve)
    2-methoxyethanol
    (methylcellosolve)
    2-butoxyethanol
    (butylcellosolve)
hexachlorobenzene
hexachlorocyclohexanes
hexachlorocyclopentadiene
hexane, n-
hydrazine
hydrogen chloride
hydrogen cyanide
hydrogen fluoride
hydrogen sulfide
isocyanates:
    methylene-bis-phenylisocyanate
    methyl isocyanate
    toluene diisocyanate
isophorene
isopropyl alcohol
lead, inorganic, and compounds
maleic anhydride
manganese and compounds
mercury and compounds
methyl alcohol

Toxic Air Contaminants (contnued)

methyl bromide
methyl chloroform (tca)
methyl mercury
methyl methacrylate
methylene chloride
methylene dianiline & 4,4'-chloride
methylethylketone (mek)
n-methylpyrrolidone
n-nitrosodi-n-butylamine
n-nitrosodi-n-propylamine
n-nitrosodiethylamine
n-nitrosodimethylamine
n-nitrosomethylethylamine
n-nitrosopyrrolidine
naphthalene
nickel and nickle compounds
nickel subsulfide
nitrobenzene
p-nitrosodiphenylamine
pahs (including but not limited to:
    benz [a] anthracene
    benzo [b] fluroanthene
    benzo [k] fluroanthene
    benzo [a] pyrene
    dibenz [a,h] anthracene
    ideno [1,2,3-cd] pyrene)
pcbs
perchloroeththylene
    (tetrachloroethylene)
phenol
phosgene
phosphine
phosphorus (white)
phthalic anhydride
propylene oxide
selenium and compounds
sodium hydroxide
styrene monomer
tetrahydrofuran
toluene
1,2,4-trichlorobenzene
1,1,1-trichloroethane
2,4,6-trichlorophenol
urethane
vapam
    (na diethyldithiocarbamate)
vinyl chloride
xylene
zinc and compounds

Appendix H

Appendix H

Sewer Systems at LLNL

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The following four pages are extracted from a document entitled *Guidelines for Discharges to the Sanitary-Sewer System*, LLNL, C.H. Grandfield, UCAR-10235 (1989).

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Program

Program *refers to LLNL programs, operations, and support groups that may generate hazardous or potentially hazardous wastes. Each* **program** *is responsible for maintaining close contact with Operations and Regulatory Affairs Division (ORAD) personnel; becoming involved in planning responsible waste-disposal procedures; implementing correct waste-management procedures; and training responsible employees in these procedures.*

Site-Discharge Limits

Taking federal, state, and local regulations into account, ORAD has developed internal discharge limits for the most common and most heavily regulated wastewater parameters. Table 1 shows the federal discharge limits that LLNL is required to apply as internal limits for selected contaminants when the generating process falls within categorical process regulations. To help ensure compliance at the Bldg. 196 outfall, the table also shows the site limits established for the specified parameters when the generating process is noncategorical. Certain other parameters that are of concern to the Livermore Water Reclamation Plant (LWRP), but that are not hazardous in themselves (e.g., biological oxygen

Table 1. LLNL's internal discharge limits for nonradioactive parameters in wastewaters from noncategorical and categorical processes, in milligrams per liter (mg/L).

Parameter	Internal Discharge limits*[a]*	Categorical limits*[b]*	
		Metal finishing	Electronic components
Copper (Cu)	10	2.07	
Chromium (Cr)	4.9	1.7	
Mercury (Hg)	0.05		
Nickel (Ni)	5	2.38	
Zinc (Zn)	15	1.48	
Silver (Ag)	1	0.24	
Lead (Pb)	4.9	0.43	
Cadmium (Cd)	0.9	0.07	
Cyanide (CN)*[c]*	5	0.65	
pH	5–10	5–10	5–10
TTO*[d]*	4.57	2.13	1.37
Oil and grease	500		

[a] These standards have been established to meet the City of Livermore's requirements at the Bldg. 196 outfall.
[b] These standards are specified by the Environmental Protection Agency (EPA). By regulation, the EPA or City of Livermore limit is used, whichever is lower. Noncategorical limits apply where no standard is specified.
[c] Limits apply to CN discharges other than CN salts. CN salts are classified by the State of California as "extremely hazardous waste" and cannot be discharged to sewer.
[d] Total toxic organics. Applies to categorical processes only. Appendix C lists the materials that comprise TTO.

demand, total dissolved solids), may also be evaluated by ORAD on a case-by-case basis to determine acceptability for release.

Table 2 shows LLNL's internal discharge limits for radioactive parameters, both for individual discharges and for the daily total. Any limits indicated in Tables 1 and 2 may be modified as regulations and interpretation of regulations change, as additional regulated processes are identified, or as effluent characteristics change. Environmental Analysts should be consulted to evaluate materials of possible concern that are not listed in either table.

Two frequently encountered issues that are of particular interest in relation to site-discharge limits are:

- The allowable pH range of the wastewater.
- A prohibition against diluting wastewaters in an attempt to meet the discharge limits.

Allowable pH Range. To meet the LWRP pH limits, and to comply with federal restrictions, the pH levels of all discharges from individual processes at the Laboratory must be maintained between values of 5 and 10. Any discharge indicating a pH less than 5 or greater than 10 must be neutralized to a pH level between 5 and 10 before the discharge can be released to the sewer. Note, however, that a pH less than 2.0 or greater than 12.5 is a hazardous waste by regulatory definition and can be neutralized only at Hazardous Waste Management's (HWM) facility. Wastestreams having pH values between 2.1 and 5 or between 10 and 12.4 can be neutralized elsewhere on the site, if done according to HWM procedures.

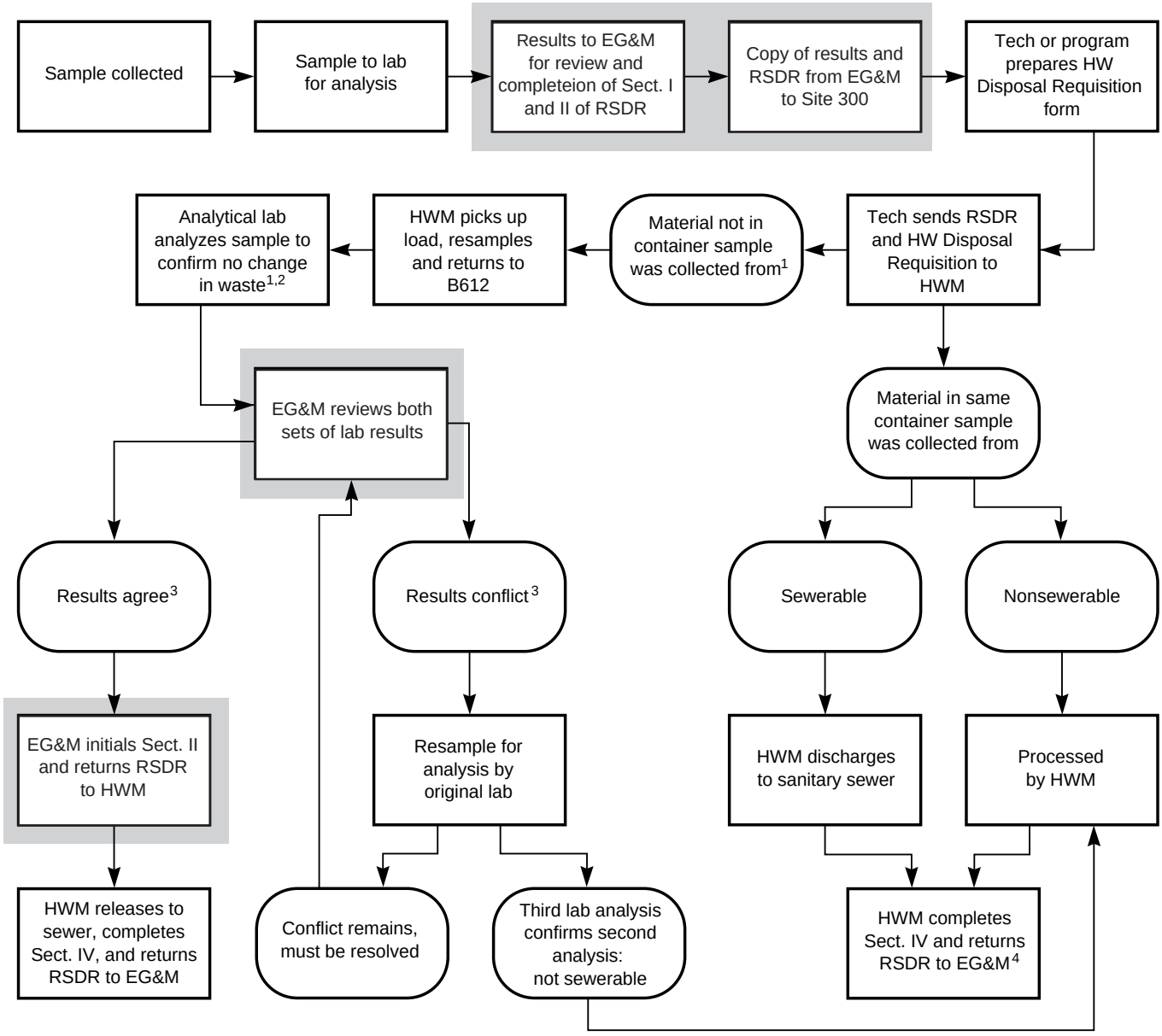
LLNL's allowable pH range (from 5 to 10) is an example of how site limits must take various, sometimes contradictory restrictions into account. State regulations establish that any waste with a pH equal to or less than 2, or equal to or greater than 12.5, is considered hazardous and can be treated with a storage and treatment permit, which is issued by the state. At LLNL, only HWM has such a permit. If other characteristics of the wastewater are within the restrictions of the permit, HWM can neutralize these wastes.

Table 2. LLNL's internal discharge limits for radioisotopes in wastewaters.

Parameter	Individual discharges	Total daily limit for site
Gross alpha	0.3 µCi/1000 L	5.0 µCi
Gross beta	3.0 µCi/1000 L	50.0 µCi
Tritium	5.0 mCi/1000 L	100.0 mCi
Gamma[a]		

[a]*There is no gross gamma limit; isotope-specific limits apply. A list of isotopic limits is available from Environmental Analysts.*

Site 300 retention-system release procedure



1. The wastewater may require analysis for constituents not included on the first analytical request form if the new container or tanker was previously used for other constituents of concern and has not been thoroughly cleaned.

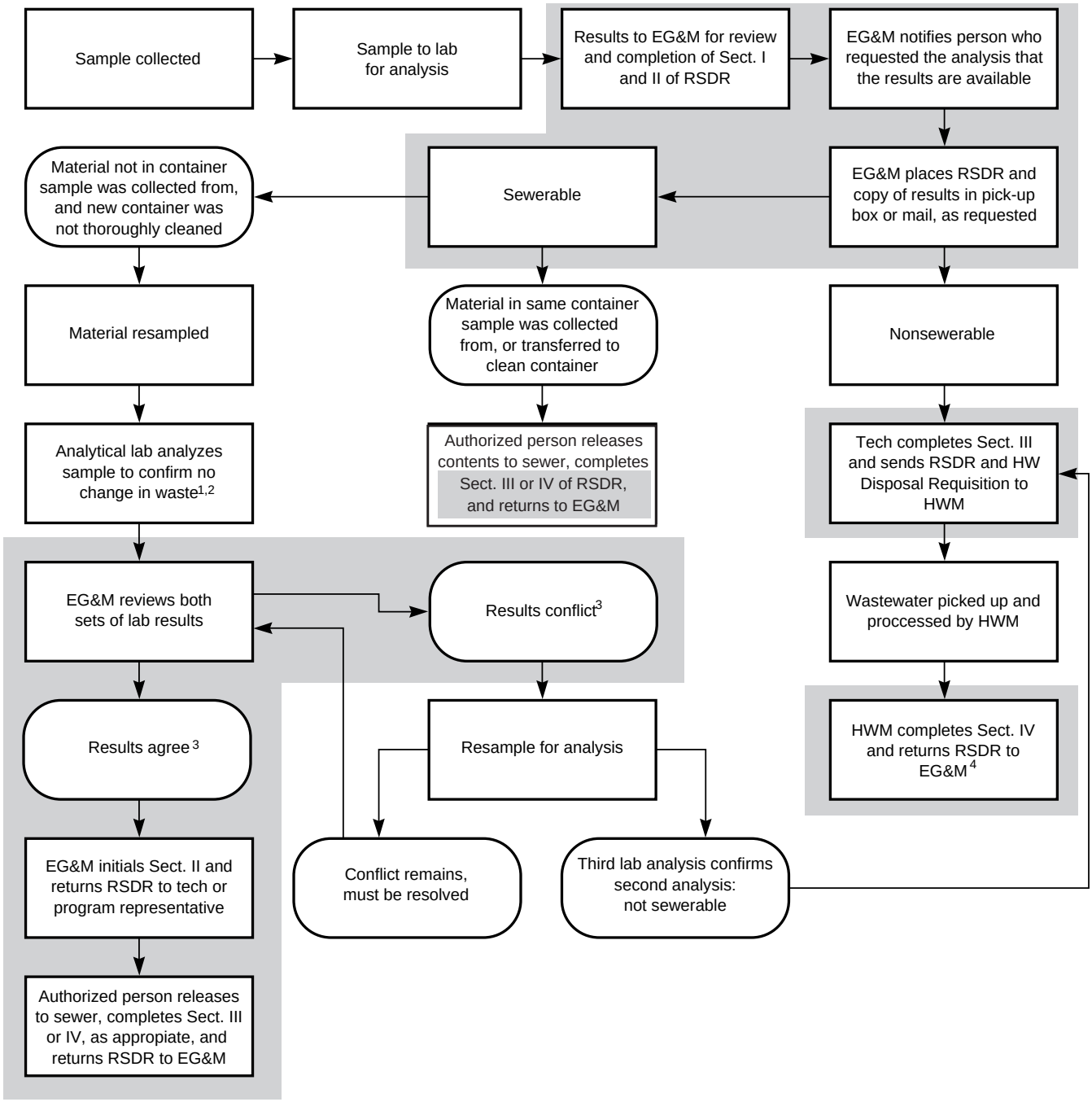
2. Put the analytical lab sample number and HW Disposal Requisition form number for the first sample somewhere on the analytical request form for the second sample. A second RSDR is not required.

3. In general, if both samples are less than the limit, it remains permissible to sewer. Resample if one is less and one is greater than the limit.

4. Subsequent tracking of wastewater available through HWM requisition system.

Figure F-1. Site 300 retention-system release procedure.

Livermore site retention-system release procedure



1. The wastewater may require analysis for constituents not included on the first analytical request form if the new container or tanker was previously used for other constituents of concern and has not been thoroughly cleaned.

2. Put the analytical lab sample number and HW Disposal Requisition form number for the first sample somewhere on the analytical request form for the second sample. A second RSDR is not required.

3. In general, if both samples are less than the limit, it remains permissible to sewer. Resample if one is less and one is greater than the limit.

4. Subsequent tracking of wastewater available through HWM requisition system.

Figure F-2. Livermore site retention-system release procedure.

Acronyms

Acronyms

CES	Chemistry & Materials Science—Environmental Services (CES) Lab
CHEW	Chemical Exchange Warehouse
COC	Chain of Custody (and Analytical Instructions)
CWAA	Consolidation Waste Accumulation Area
DEA	Drug Enforcement Agency
DOE	Department of Energy
DOE/NV	Department of Energy Nevada Field Office
DOT	Department of Transportation
DTSC	Department of Toxic Substances Control
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
ES&H	Environmental, Safety, and Health
FTIR	Fourier transmission infrared spectroscopy
FSP	Facility Safety Procedure
HEPA	High-efficiency particulate air (filter)
HMPT	Hazardous Materials Packaging and Transportation
HWCL	Hazardous Waste Control Law
HWM	Hazardous Waste Management
HWM TSDF	Hazardous Waste Management Treatment Storage Disposal Facility
LDR	Land Disposal Restriction
LLNL	Lawrence Livermore National Laboratory
LLW	Low-level waste
LWRP	Livermore Water Reclamation Plant
MBA	Materials Balance Area
MOU	Memo(s) of Understanding
MSDS	Material Safety Data Sheet
NTSWAC	Nevada Test Site Waste Acceptance Criteria
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
OSP	Operational Safety Procedure

PCB	Polychlorinated biphenyl
PEL	Permissible Exposure Limit
PKE	Process Knowledge Evaluation (form)
PPE	Personal Protective Equipment
QA	Quality assurance
RCRA	Resource Conservation and Recovery Act
RMMA	Radioactive Materials Management Area
SAA	Satellite Accumulation Area
SAW	Sampling and Analysis Worksheet
TAC	Toxic Air Contaminants
TRU	Transuranic waste
TSCA	Toxic Substances Control Act
TSDF	Treatment, storage, and disposal facility
WAA	Waste Accumulation Area
WAC	Waste Acceptance Criteria
WCP	Waste Certification Program
WDR	Waste Disposal Requisition
WEF	Waste Evaluation Form
WIPP	Waste Isolation Pilot Plant
WIPP WAC	Waste Isolation Pilot Plant Waste Acceptance Criteria
WPAA	Workplace Accumulation Area
WPC	Waste Parcel Card
XRF	X-ray fluorescence