WOOD PRESERVING RESOURCE CONSERVATION AND RECOVERY ACT COMPLIANCE GUIDE

A GUIDE TO FEDERAL ENVIRONMENTAL REGULATION

JUNE 1996

Office of Compliance
Office of Enforcement and Compliance Assurance
U.S. Environmental Protection Agency
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Washington, DC 20460

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********* IMPORTANT NOTICE *********

This document attempts to explain in one place the sometimes complex Federal requirements that wood preserving facilities are subject to under the Resource Conservation and Recovery Act (RCRA). This guidance document should not be interpreted as providing changes to existing regulations. It is intended only as a clarification of existing regulations. Furthermore, because the Guide is designed to summarize, in plain English, the applicable regulations and to provide additional information sources, it is not a substitute for regulations published in the Code of Federal Regulations (CFR). In order to further simplify the additional Federal regulations that apply to these facilities, background information on the industry and summaries of other environmental statutes that effect this industry are included.

This document was prepared by EPA contractor Booz·Allen & Hamilton Inc. in close consultation with an ad hoc task force composed of EPA and State inspectors. The document responds to questions raised by industry personnel via the American Wood Preservers Institute. It has been reviewed by the Association of State and Territorial Solid Waste Management Officials (ASTSWMO) and industry representatives associated with the American Wood Preservers Institute.

This Guide is an outgrowth of the U.S. EPA's Office of Compliance Sector Guide Project. During the project, a series of 18 profiles on various industry sectors (as defined by two digit Standard Industrial Codes) was developed containing information of general interest. The EPA document numbers of the profiles range from EPA/310-R-95-001 to EPA/310-R-95-018. This Guide, which is in extension of the Profile of the Lumber and Wood Products Industry (EPA/310-R-95-006), contains detailed information on the Wood Preserving Industry (SIC 2491). The goals of the Guide are to provide environmental professionals with useful information specific to the wood preserving industry, such as process descriptions and the geographic distribution of the industry, and to address in plain-English many of the regulatory interpretation questions that arose out of the RCRA drip pad standards and hazardous waste listings.

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U.S. Environmental Protection Agency
Wood Products Contact
Manufacturing Energy and Transportation Division (2223A)
401 M Street S.W.
Washington, D.C. 20460
Phone (202) 564-2300

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Wood Preserving Compliance Task Force Members

State Agency Representatives		**Phone**
Yen Bao	Virginia	(804) 698-4403
Penny Brown	West Virginia	(304) 256-6850
Gary Calaba	Oregon	(503) 229-6534
Karen Cates	Florida	(904) 448-4320 ext. 368
Martin Herrick	Wisconsin	(608) 266-5798
Vonnie Kallemeyen	South Dakota	(605) 773-3153
Viki Leuba	Washington	(509) 625-5179
Jim McNamara	Georgia	(404) 657-8657
Andy Slusarski	Maine	(207) 287-2651

U.S. EPA Representatives		**Phone**
Anthony Carrell	Headquarters	(703) 308-0458
Mike Fagan	Region X	(206) 553-6646
Bart George	Region II	(206) 637-3192
Bill Hamele	Headquarters	(202) 564-4012
Seth Heminway	Headquarters	(202) 564-7017
Bruce Long	Region X-Oregon	(503) 326-3686
Dan Patulski	Region V	(312) 886-0656
Bill Rothenmeyer	Region VIII	(303) 312-6045
Ron Shannon	Region VI	(214) 665-2282
Mike Silverman	Region X-Idaho	(208) 334-9389
Anna Torgrimson	Region IV	(207) 287-2651

Amercian Wood Preservers Institute Compliance Task Force

Gene Bartlow
President
American Wood Preservers Institute
1945 Old Gallows Rd. Suite 150
Vienna, VA 22182
(703) 893-4005

Scott Conklin
Director of Wood Preservation
Universal Forest Products
2801 East Beltline N.E.
Grand Rapids, MI 49505
(616) 365-1563

Nick Bock
Manager, Environmental Affairs and
Regulatory Compliance
Kerr-McGee Chemical Corp.
P.O. Box 25861
Oklahoma City, OK 73125
(405) 270-2394

Mr. Martin Rollins
President
H. Martin Rollins Company
P.O. Box 3471
Gulfport, MS 39505
(601) 832-1738

Steve Smith
Environmental Manager
Koppers Industries, Inc. (rm. 1800)
436 Seventh Ave.
Pittsburgh, PA 15219-1800
(412) 227- 2677

Ross Worsham
Senior Environmental Engineer
Atlantic Wood Industries Inc.
P.O. 1608
Savannah, GA 31402
(912) 964-1234

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LIST OF ACRONYMS

ACA	Ammonical Copper Arsenate
ACC	Acid Copper Chromate
ACQ	Ammonical Copper Quat
ACZA	Ammonical Copper Zinc Arsenate
ARARs	Applicable or Appropriate Requirements
ASTSWMO	Association of State and Territorial Solid Waste Management Officials
AWPI	American Wood Preservers Institute
CAA	Clean Air Act
CAP	Consumer Awareness Program
CBA	Copper Azole
CC	Ammonical Copper Citrate
CCA	Chromated Copper Arsenate
CDDC	Copper Dimethyldithiocarbomate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (commonly known as Superfund)
CFR	Code of Federal Regulations
CIS	Consumer Information Sheet
CWA	Clean Water Act
DOT	U.S. Department of Transportation
EHS	Extremely Hazardous Substance
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FR	Federal Register
HAPs	Hazardous Air Pollutants
HSWA	Hazardous and Solid Waste Amendments (to RCRA)
LDR	Land Disposal Restrictions
LEPC	Local Emergency Planning Committee
LQG	Large Quantity Generator
MSDS	Material Safety Data Sheet
NESHAPs	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NIOSH	National Institute for Occupational Safety and Health
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priorities List
NRC	National Response Center
NSPS	New Source Performance Standards
OSHA	Occupational Safety and Health Act/Administration
PE	Professional Engineer
PEL	Permissible Exposure Limit
POTW	Publicly-Owned Treatment Works
PPE	Personal Protective Equipment

RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
SERC	State Emergency Response Commission
SIP	State Implementation Plan
SQG	Small Quantity Generator
TCLP	Toxicity Characteristic Leaching Procedure
TPQ	Threshold Planning Quantity
TSCA	Toxic Substances Control Act
TSDF	Treatment, Storage, and Disposal Facility
TRI	Toxic Release Inventory
UIC	Underground Injection Control
UST	Underground Storage Tank
WAP	Waste Analysis Plan

SECTION 1
INTRODUCTION

Introduction

The United States Environmental Protection Agency (EPA) has developed this Wood Preserving RCRA Compliance Guide to provide summary information on the statutory and regulatory requirements applicable to wood preserving facilities. The document was developed for facilities that use, or have used, wood preserving chemicals and have the potential to generate waste that is considered hazardous under the Resource Conservation and Recovery Act (RCRA). After numerous inspections of wood preserving facilities, EPA has found that although many plants do effectively control their wastes and comply with environmental regulations, some do not. The purpose of the Guide is to help bring non-compliant facilities into compliance by providing guidance and references to applicable Federal environmental regulations. In addition, it will serve as a reference tool for those facilities already in compliance so that owners/operators may fine tune their understanding of these regulations.

This Guide was developed by a task force consisting of EPA and State inspectors, and was a collaborative effort between these groups. In addition, representatives of the wood preserving industry were consulted about the questions that frequently arise within the industry and the information that would be most useful for Guide readers. The Guide has been reviewed by EPA and State inspectors as well as representatives of the American Wood Preservers Institute (AWPI). EPA would like to thank all of those who participated in the review process.

Although the Guide focuses on requirements imposed under RCRA's hazardous waste management regulations, it also provides brief summaries of other environmental statutes that may affect the wood preserving industry. Explanations of regulatory requirements should help to build a common base upon which both EPA inspectors and members of the regulated community can form consistent interpretations of the Federal regulations.

The discussions of the statutes and regulations in this document are not intended to be exhaustive, but have been designed to be used for quick reference. They are not meant to replace in-depth analysis of statutes, regulations, or EPA guidance, and should not be considered a replacement for knowledge of the regulations contained in the Code of Federal Regulations (CFR). This document does not change or supersede existing regulations, but rather seeks to clarify them.

Intended Audience

This document has been prepared for wood preserving facilities in the United States. It is intended to provide an easy to understand summary of the Federal environmental compliance requirements under RCRA that regulate wood preserving facilities. EPA hopes that this Guide will assist facility personnel by providing the information they need to achieve and maintain compliance with applicable environmental regulations. EPA also anticipates that the information presented here will be useful to Federal, State, and local inspectors who may not be familiar with wood preserving processes and the various management practices employed by the industry.

Scope of the Compliance Guide

The Guide provides a general overview of the wood preserving industry in the United States and the Federal environmental regulations with which the industry must comply. It is written primarily for those owners/operators of facilities that are generators of RCRA hazardous waste, not facilities that have RCRA permits, are operating under interim status (see permitting discussion in Section 3), or that do not generate hazardous waste at all (some wood preserving facilities use chemicals in their processes that do not generate hazardous waste). The following information is contained in this Guide:

- Size and geographic distribution of wood preserving facilities in the United States
- General overview of RCRA requirements
- Types of wastes generated at wood preserving facilities
- Environmental compliance concerns relating to drips pads, tanks and sumps, and storage yards at wood preserving facilities
- Additional relevant environmental statutes and regulatory schemes
- Answers to commonly asked questions concerning regulatory requirements
- Names and phone numbers of organizations that can provide additional information.

Potential for Increased State Stringency

It is important to note that State and local restrictions concerning wood preserving facilities may, in fact, be more stringent than Federal regulations. Individual State requirements are not discussed in this Guide, but may be applicable to facilities within that State. Thus, it is imperative that owners/operators of wood preserving facilities seek additional guidance in determining the applicability of more stringent State and local requirements. State authorization issues as they directly apply to the wood preserving industry are discussed in more detail in Section 4 of this Guide.

Using this Guide

In addition to a detailed description of RCRA regulations that apply to the wood preserving industry, this Guide also contains a general summary of other aspects of the Federal RCRA program and its regulations. Readers who have extensive experience with wood preserving facilities may choose to skim over Section 2 (overview of wood preserving industry) and Section 3 (overview of RCRA), and focus on Sections 4 through 7 (wood preserving wastes and regulations applicable to wood preserving facilities).

References to Regulation

The end of each section contains a shaded box with regulatory citations and references to information discussed in that section. Please consult these regulations and other references for a more in-depth discussion of applicable requirements.

SECTION 2
OVERVIEW OF THE WOOD PRESERVING INDUSTRY

Industry Overview

Note: *This section has been included to give State and EPA inspectors at wood preserving facilities a brief overview of the industry. Much of the information presented in this section is common knowledge to members of the wood preserving industry.*

Surface Protection versus Wood Treatment

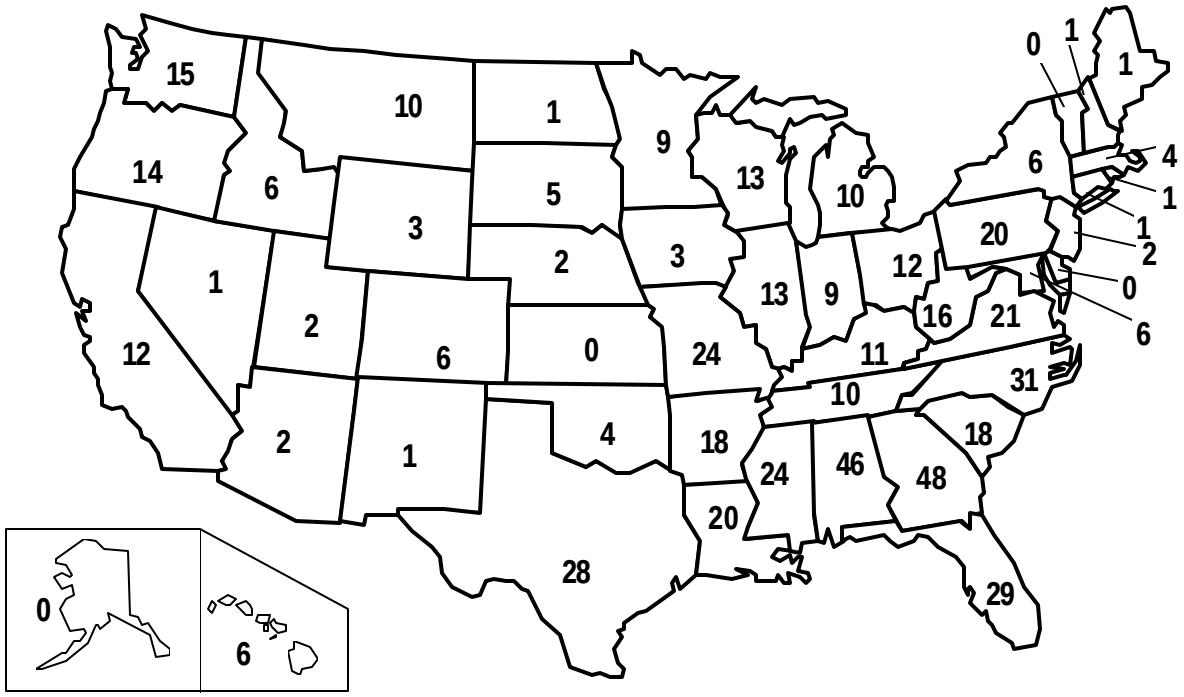
The purpose of wood preserving, also called wood treatment, is to provide long-term protection from the damaging effects of fungi, insects, and marine borers, thereby extending the usable life of wood products. This is accomplished through the application of an EPA registered preservative solution to timber. Wood treatment is different from surface protection processes in that **surface protection** is characterized by non-pressure applications to the surface of the wood that are designed to provide short-term cosmetic protection against mold and sap stains. **Wood preserving**, on the other hand, involves the penetration of preservative solutions into wood to preserve its structural integrity and improve its resistance to weathering, water, and ground contact. Wood surface protection and wood preserving are often confused since, historically, chlorophenolic formulations were used in both processes. Chlorophenolic formulations are now only used in wood preserving. In addition, while EPA has chosen to specifically identify wastes from the wood preserving industry that use chlorophenolic formulations as hazardous wastes, the Agency also concluded that the regulation of chemicals that are now used in surface protection is not warranted on the Federal level.

Almost all timber is processed in some way before being sold. The following wood products are normally treated in a preservation process before commercial distribution: dimensional lumber (i.e., lumber that has been cut to a specific shape or size) that will endure prolonged exposure to the ground or weather, railroad ties, telephone poles, telephone cross arms, bridge beams, fencing, window sills, doors, and pilings.

Geographic Distribution of Wood Preserving

Wood preserving facilities are located in varying numbers in almost every State. As indicated in Exhibit 1, the highest concentration of facilities is in the Southeast and Northwest where there is a ready supply of raw wood. Exhibit 2 illustrates the size of wood preserving operations in the industry.

Exhibit 1
Geographic Distribution of Wood Preserving Facilities



Total: 551 **Puerto Rico 6**

Source: These figures were compiled through consultation with field personnel in each State or EPA Region. Because exhaustive confirmation was not done on the number of facilities in all States, these numbers should be considered estimates.

Exhibit 2
Industry Facility Size Distribution - 1992

Type of Facility	Facilities with 1 to 19 employees	Facilities with 20 to 99 employees	Facilities with 100 or more employees	Total
SIC 2491 - Wood Preserving	307	168	11	486

Source: Based on 1992 Bureau of the Census Data.

According to 1992 census data, of the total of 486 wood preserving facilities, a large portion of them, approximately 63 percent, employed between 1 and 19 people, 34 percent employed between 20 and 99 people, and 2 percent of the facilities employed over 100 people. The bulk of wood preserving facilities are small operations, that are usually supplied with preservative formulation by several larger national chemical

companies. The chemical supply companies frequently offer their clients training and guidance on complying with environmental regulations as well as professional services such as hazardous waste management and engineering. There also appears to be a trend in the industry toward larger companies acquiring independent wood preserving companies and operating them as subsidiaries.

Note: *EPA has not attempted to reconcile the Bureau of the Census data with its own facility count. This data is mentioned because it gives a valuable indication of the relative size of wood preserving facilities.*

Wood Preserving Process

The preservation process that is applied to a particular bundle, or **charge**, of wood varies with the type of wood being treated and any particular product specifications that the wood treater may need to consider (e.g., wood that is used for construction of outdoor structures warrants a higher degree of protection due to prolonged exposure to climatic elements). Wood is porous and each wood preserving process takes advantage of this fact to impregnate the wood with preservative. In most cases, the process begins with a preliminary **conditioning step** that assures a prescribed moisture content in the wood. Less moisture allows more preservative to penetrate and remain in the wood, providing increased protection.

To change the moisture content, a variety of steps can be taken. These include: air or kiln drying; Boulton drying, which consists of pulling a vacuum on the treating cylinder while the wood is immersed in a heated oil-borne solution; or steam conditioning, which consists of heating the wood in the treating cylinder with steam for several hours then rapidly vacuuming the wood to remove moisture. The pressure or treatment cylinder where the preservative is actually applied to the wood is commonly called a **retort**.

After conditioning, preservative solution is applied to the wood. Most facilities use pressurized cylinders (retorts) to apply the preservative solution. This involves placing charges of wood into the retort and applying the preservative under a pressure system until sufficient penetration and retention of the preservative into the wood has occurred. The desired degree of penetration and retention is determined by prescribed product specifications and will dictate how long the pressure is applied. Excess preservative is drawn from the wood through a vacuum system, and pumped back into the process tank, where it will be used again in the same process.

A small percentage of facilities use non-pressurized dip tanks to treat wood. This involves simply lowering the charges into a vat of preservative, usually an oil-borne preservative. The charge is then allowed to soak in the vat until a predetermined degree of penetration is reached. Penetration is sometimes aided by heating and then cooling the preservative.

There are a number of common pressure processes currently used by the wood preserving industry to treat wood. These include full-cell, modified full-cell, and empty-cell processes. Also, a variety of preservatives are used, which are either water- or oil-borne. The different wood preserving processes and solutions are discussed below.

Oil-Borne Processes

Two primary types of pressure vacuum treatments, empty-cell and full-cell, are used to apply oil-borne preservatives. Examples of **oil-borne preservatives** include creosote, creosote petroleum mixtures, copper napthenate, and pentachlorophenol. Creosote is commonly used to treat railroad ties, telephone poles, pilings, and bridge beams, while pentachlorophenol is most often mixed into solution with oil to treat telephone poles.

The most widely used process is called **empty-cell.** In this process, the cells of the wood are merely coated with preservative. The empty-cell process obtains deep penetration of preservative and attempts to leave the cell walls of the wood treated, while leaving a minimum of excess preservative in the void spaces of the cells. Because a smaller amount of preservative is used compared to the full-cell processes, the product is lighter and easier to ship. The empty-cell process also results in less expensive treatment costs for the facility since less preservative remains in the wood.

One type of empty-cell process is the **Lowry** process, which entails filling the retort with preservative while maintaining atmospheric pressure. When the retort is filled with preservative, pressure is applied, forcing preservative into the wood. This compresses the air contained in the cells of the wood, allowing preservative to fill the balance of the cell. Once the desired amount of preservative has been injected, usually over the course of several hours, the retort is drained and a final vacuum is applied. During this last step, much of the preservative in the cells is forced out by the remaining air in the cells of the wood, which expands as it is subjected to the vacuum and then returned to ambient pressure. This vacuum also minimizes drippage after the charge is removed from the retort and is placed onto the drip pad.

The most widely used empty-cell process is the **Rueping** process in which air pressure is applied and maintained in the retort prior to filling the retort with preservative. When the retort is completely filled with preservative, pressure is applied to force the solution into the wood. Once the pressure is released, the retort is drained and the final vacuum is applied. As a result of internal pressure, even more preservative is forced out of the wood than in the Lowry process.

The second type of wood preserving process is called the **full-cell** (or **Bethell**) process because it results in a higher retention level by nearly filling the wood cells with preservative. In this process, most of the air in the retort is pumped out, creating a strong vacuum which is then held to draw most of the air out of the wood. The retort is then filled with preservative without breaking the vacuum, forcing preservative into the cell spaces that have been created by the evacuated air. When the retort is completely filled with preservative, pressure is applied to force the solution into the wood. Once the pressure is released, the preservative is pumped out of the retort and a final vacuum is drawn to force out excess preservative. When the vacuum is released, much of the remaining surface preservative is drawn back into the wood, reducing the amount of drippage once the charge is taken out of the retort. Exhibit 3 on the next page illustrates the oil-borne wood preserving process.

Full-cell and modified full-cell processes are used to apply water-borne preservatives. The full-cell process utilized at water-borne facilities is very similar to that used for oil-borne preservatives. The modified full-cell process applies a weaker, or lower, initial vacuum to retain more air in the cells of the wood. Once the pressure treatment phase is complete, the remaining air (now expanding because pressure has stopped) displaces the preservative which is, in turn, forced out of the wood. By forcing more preservative out of the wood, weight is minimized and subsequent shipping costs are reduced. Exhibit 4 illustrates the water-borne wood preserving processes.

Exhibit 3
Wood Preserving Facility Process Schematic
(oil-borne preservative)

Exhibit 4
Wood Preserving Facility Process Schematic
(water-borne preservative)

Water-borne preservatives contain active ingredients that are inorganic metal oxides, or less frequently salts, and are commonly used to treat dimensional lumber and telephone poles. This type of preservative includes oxine copper, ammonical copper citrate (CC), copper azole (CBA), copper dimethyldithiocarbomate (CDDC), chromated copper arsenate (CCA), ammonical copper arsenate (ACA), acid copper chromate (ACC), ammonical copper zinc arsenate (ACZA), and ammonical copper quat (ACQ). As this Guide will discuss, wastes that are generated by wood preserving facilities, especially those using creosote, chlorophenolic, or arsenical-based preservatives, have the potential to be considered hazardous waste under RCRA. Wastes commonly generated in the wood preserving industry are discussed in more detail in Section 6 of this Guide.

Past mismanagement of toxic chemicals at wood preserving facilities has caused significant contamination of soil and groundwater at some sites. As of May 1996, more than 45 wood preserving sites had been placed on Superfund's National Priorities List (NPL) for priority cleanup of contamination. The majority of contamination has been found at older facilities that operated for many years before current environmental regulations and disposal options existed. Along with other poor waste management practices, contamination is generally caused by excess preservative, called **kickback**, that has been allowed to drip onto the ground from treated charges of wood.

A growing concern over the presence of dioxins and furans in chlorophenolic wastes found at some facilities, coupled with the desire to prevent the release of arsenic into the groundwater, has led EPA to regulate the wood preserving industry under RCRA. In 1990, the first RCRA regulations specifically addressing many wood preserving wastes were published. These standards require owners/ operators of many wood preserving operations to comply with RCRA. Subsequently, EPA promulgated rules requiring tighter management of hazardous waste generated by the wood preserving industry. As a result, many facilities in the industry have invested heavily in cleaning up existing contamination and complying with regulatory standards for facility construction and proper waste management.

Health Concerns Associated with Wood Preserving Industry

The primary reason behind RCRA's preservative containment requirements is to keep preservative chemicals out of ground and surface waters. Contamination of soil and groundwater is a serious problem because it can move considerable distances as it is picked up by water moving through the soil and the water table. Because there are few, if any,

naturally occurring organisms in the environment that can readily break down these chemicals. Once the contamination enters the ground it has the potential to linger for long periods of time and cause extensive contamination to surrounding subsurface environments.The wood preservatives creosote, pentachloro-phenol, and inorganic arsenicals contain toxic constituents that have the potential to cause skin, eye, and respiratory irritation as well as more serious ailments in humans, if humans are overexposed to them. Some of these constituents have been classified as carcinogens through epidemiological exposure studies on animals. Exposure of aquatic plant and animal life to these toxic constituents has also been found to have adverse effects.

Toxic constituents in wastes generated by the wood preserving industry have been found to have chronic systemic effects on laboratory animals as well as humans and have been determined to be present in sufficient concentrations to pose a substantial threat to human health and the environment. For example, previous studies of pentachlorophenol have shown it to be highly toxic to humans. Exposure to pentachlorophenol can cause contact dermatitis, damage to vision, and upon ingestion, lung, liver, and kidney damage. Inhalation of pentachlorophenol can result in acute poisoning, centering on the circulatory system with possible accompanying heart failure. Other studies have shown pentachlorophenol to be a carcinogen.

One of the most commonly used preservatives in the wood preserving industry is chromated copper arsenate, or CCA. This formulation contains water, arsenic acid, chromic acid, and copper oxide. Overexposure to CCA can damage mucous membranes and tissues of the respiratory system and cause chemical burns on the skin and even skin lesions. Ingestion of large amounts of CCA may have more serious effects. Chronic exposure to significant doses of the chemical components of CAA can lead to mental confusion, loss of coordination, and impaired senses of touch, pain, and temperature. CCA is also considered a possible carcinogen.

From this data, it is clear that many of the chemicals used in the wood preserving industry have the potential to threaten human health when handled in an unsafe manner. As a result, it is crucial that plant employees, and anyone else coming into contact with preservative solutions containing these constituents, be extremely cautious when handling the chemicals. Some recommended precautions are discussed below.

Health Precautions for Plant Personnel

In order to minimize exposure to wood preserving chemicals, operators of wood treatment equipment should closely follow company policy and

all applicable Federal, State, and local regulations concerning use and management of those chemicals. At a minimum, facility personnel should:

- Use preservatives in accordance with the EPA approved manufacturer's label.
- Follow pesticide label and Occupational Safety and Health Act (OSHA) requirements for personal protective equipment.
- Avoid direct contact with the chemicals by wearing protective gloves and washing hands and other exposed skin before eating, using tobacco products, or using the rest room.
- Enter the retort or other confined space only in accordance with an OSHA confined space entry plan.
- Wear a respirator in process areas at inorganic arsenial wood treating plants, unless PEL air monitoring has demonstrated that it is safe not to wear one.

Additional information is available on the subjects discussed above:

- For more information on the wood preserving process, consult The Preservation of Wood, A Self Study Manual for Wood Treatment. Revised by F. Thomas Milton, University of Minnesota, College of Natural Resources, Department of Forest Products, 1994.
- Preservative Treatment of Wood by Pressure Methods. ID, McLean, USDA Agriculture handbook, No. 4D, December 1952 (Reprinted with corrections September 1960).
- Wood as an Engineering Material; Wood Handbook, Chapters 17-19. USDA Agriculture Handbook, No. 72, Revised 1974.
- Wood Deterioration and its Prevention by Preservative Treatment. Darrel D. Nicholas, editor, with the assistance of Wesley E. Loos, Syracuse University Press, 1973 (two volumes).

SECTION 3
GENERAL OVERVIEW OF RCRA

Introduction

This section of the Compliance Guide contains a basic discussion of the requirements imposed on wood preserving facilities by RCRA. This section will cover the following general topics:

- Why the RCRA program was developed
- Identification of hazardous waste
- Generators of hazardous waste
- Hazardous waste management
- Land disposal restrictions
- RCRA permitting
- Closure of hazardous waste management units
- Underground storage tank requirements
- State authorization.

Note: *Readers who are already familiar with the RCRA program may not find it necessary to read this section of the Guide, but rather, should move directly to Section 4.*

Why the RCRA Program was Developed

RCRA, an amendment to the Solid Waste Disposal Act, was enacted in 1976 to ensure the safe disposal of the huge volumes of municipal and industrial solid waste generated nationwide. RCRA has been amended by Congress several times, most significantly in November 1984, by the Hazardous and Solid Waste Amendments (HSWA). These amendments significantly expanded the scope and requirements of RCRA, resulting in the regulation of much of the waste generated in this country, both hazardous and non-hazardous.

Many of the wood preserving facilities in the United States were in operation long before the inception of the RCRA program. Although RCRA creates a framework for the proper management of hazardous and non-hazardous waste, it does not directly address the problems of hazardous waste associated with inactive or abandoned sites, or spills of chemicals that may require emergency response. Many wood preserving sites, both inactive and operating, already contain significant soil and groundwater contamination as a result of years of chemical use prior to the enactment of environmental regulations. RCRA's Corrective Action Program plays a role in requiring the cleanup of such historically contaminated sites; however, this type of problem can also be addressed

under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLA, commonly known as Superfund, mandates the cleanup of historically contaminated sites. In addition to such remedial activities, Superfund also requires owners/operators of facilities to notify EPA in the event of a release of certain hazardous substances into the environment. See Section 8 for more information on the Superfund program.

RCRA Program Goals

The RCRA program is based upon three distinct goals aimed at creating a safe and effective hazardous waste management system. They are:

- Protection of human health and the environment
- Reduction of waste and conservation of energy and natural resource
- Reduction or elimination of the generation of hazardous waste.

RCRA is divided into ten sections, or **subtitles**, that provide EPA with a framework to achieve these goals. For example, Subtitle D governs the management of non-hazardous solid waste, while Subtitle I creates a regulatory program for the management of underground storage tanks. **Subtitle C**, which addresses hazardous waste management, is the subtitle which has the greatest impact on the regulation of wood preserving facilities.

RCRA Subtitle C

Subtitle C of RCRA establishes a "cradle-to-grave" management system for controlling hazardous waste from its point of generation to final disposal. The objective of Subtitle C is to ensure that hazardous waste is handled in a manner protective of human health and the environment. Pursuant to Subtitle C, EPA has issued regulations regarding the generation, transportation, treatment, storage, and disposal of hazardous waste. Facilities affected by these regulations must be maintained and operated in a manner that will minimize danger to human health and the environment. Many of the regulations that specifically address the wood preserving industry concern the construction, operation, and maintenance of hazardous waste drip pads. These drip pad requirements are found in a specific subsection of Subtitle C called **Subpart W**. Those within the wood preserving industry commonly refer to the drip pad regulations as the "Subpart W standards" or "RCRA Subpart W."

Subtitle C is discussed in greater detail below. Both the general requirements of Subtitle C, as well as those specific to the wood preserving industry, are included.

Identification of Hazardous Waste

The regulatory framework established under Subtitle C of RCRA was designed to protect human health and the environment from the effects of improper management of hazardous waste. As a result, identifying whether a waste is hazardous is crucial in determining the applicability of the Subtitle C regulations.

Wastes are considered hazardous for different reasons, and the responsibility for determining if a particular waste is hazardous falls on the generator of that waste (see the discussion of hazardous waste generators in Section 4).

In general, RCRA defines hazardous waste as a solid waste, which because of its quantity, concentration, or physical or chemical characteristics may:

- Cause or contribute to significant injury or death, or
- Damage or pollute the land, air, or water.

Hazardous Waste Under RCRA

A solid waste, defined by RCRA as any material including liquids, sludges, and contained gases that is disposed, burned, or recycled in a certain manner, is considered hazardous if it:

- Exhibits any one of the **characteristics** of a hazardous waste
- Has been specifically **listed** as a hazardous waste in the regulations
- Is a **mixture** containing a listed hazardous waste and a non-hazardous waste
- Is a waste **derived** from the treatment, storage, or disposal of a listed hazardous waste.

Each of these four categories is discussed in greater detail below.

Characteristic Wastes

Characteristic wastes, as defined under RCRA, are identified by a specific number, or **waste code,** that begins with the letter "**D**." A waste is hazardous if it exhibits one or more of the following characteristics:

- **Toxicity (D004-D043)**—The toxicity characteristic identifies a list of constituents that, if present in concentrations greater than specified levels, are considered a threat to human health and the environment. A test called the Toxicity Characteristic Leaching Procedure (TCLP) demonstrates whether a waste contains levels of hazardous constituents above regulatory thresholds. Wastes exhibiting the toxicity characteristic are given specific waste codes depending on the hazardous constituent of concern. For example, TCLP results indicating levels of arsenic or chromium greater than 5.0 parts per million (ppm) in a waste stream are toxic for arsenic and chromium, and are given the waste codes "D004" and "D007," respectively. Wastes generated by the wood preserving process are likely to exhibit the characteristic of toxicity.

- **Ignitability (D001)**—These wastes are easily combustible or flammable. Examples of ignitable wastes include spent solvents and discarded fuels.

- **Corrosivity (D002)**—These wastes dissolve metals or other materials, or burn the skin. Common corrosive wastes include caustic soda and nitric acids.

- **Reactivity (D003)**—These wastes are unstable or undergo rapid or violent chemical reaction with water or other materials. Cyanide- or sulfide-bearing wastes typically exhibit the characteristic of reactivity.

Listed Wastes

In addition to the four characteristic wastes, a waste is also hazardous if it is specifically identified on one of four lists developed by EPA. A hazardous waste listing is a narrative description of a specific type of waste that EPA considers dangerous enough to warrant regulation. Hazardous waste listings describe wastes from specific sectors of industry (e.g., the wood preserving industry), or specific chemical formulations.

Before developing a listing, EPA thoroughly studies a particular waste stream and the threat it can pose to human health and the environment. If the waste poses a great enough threat to warrant regulation, EPA includes a precise description of that waste on one of the hazardous waste lists. Any waste that meets the narrative listing description is considered hazardous, regardless of its chemical composition or any other potential variable. The three types of listed wastes are:

- **F-listed wastes—**Wastes from **nonspecific sources** that are produced by a number of manufacturing and industrial processes. Examples of F-listed wastes commonly generated by the wood preserving industry are wastes generated from processes that use chlorophenolic formulations (F032), creosote (F034), and inorganic preservatives containing arsenic or chromium (F035).

- **K-listed wastes—Specific source wastes** generated by particular industries identified by EPA. Wood preserving operations are among those identified in the regulations. As such, many wood preserving facilities that employ processes that use creosote and/or pentachlorophenol have the potential to generate K-listed waste, "K001."

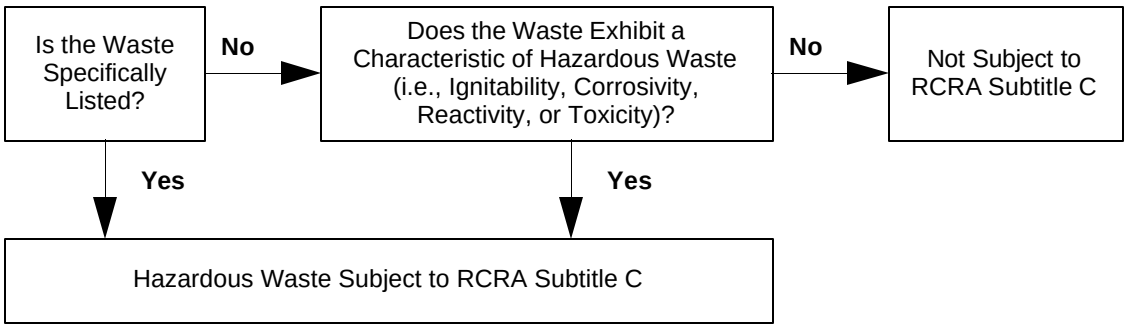
Note: *Many owners/operators overlook the possibility of a waste meeting the K001 description. This listing is for bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol. Also, it should be noted that any waste stream meeting the K001 waste code description cannot also be classified as one of the F-listed wood preserving wastes (F032, F034, or F035). These F listings specifically exclude K001 wastes.*

- **P-listed wastes—**Specific unused or off-specification **commercial chemical products** that are being discarded. EPA has specifically identified wastes on the P-list as being **acutely hazardous**.

- **U-listed wastes**—Specific unused or off-specification commercial chemical products that are being discarded. An example of a potential U-listed waste that may be of concern to the wood preserving industry is unused creosote (U051).

Exhibit 5 outlines some of the questions that should be asked to determine whether a waste is hazardous under RCRA Subtitle C.

Exhibit 5
Hazardous Waste Determination



Note: This chart assumes that a number of other decisions concerning hazardous waste determination have been made. Specifically, the information in the chart assumes that the waste in question has already been determined to be a solid waste under RCRA (§261.2), and that the waste is not otherwise excluded from RCRA regulation in any way (e.g., under §§260.30, 261.2, or 261.4).

Hazardous Waste Mixtures

RCRA also regulates the waste resulting from the mixture of hazardous and nonhazardous wastes. A mixture involving characteristic wastes is hazardous only if the mixture itself exhibits a characteristic. Under the "**mixture rule**" for listed wastes, however, a mixture made up of non-hazardous solid waste and any amount of a listed hazardous waste is, itself, a listed hazardous waste. The mixture will bear the same waste code and regulatory status as the original listed component of the mixture. This principle applies regardless of the percentage of listed waste in the waste mixture, the actual threat posed by the waste mixture, or the mixture's chemical composition. The mixture rule was originally created to prevent the dilution of listed wastes as a substitute for treatment activities.

Contaminated Media

EPA's **contained-in policy** addresses environmental media (e.g., soil, sediment, and groundwater) contaminated with hazardous waste. According to this policy, any media that is contaminated with a listed waste must be managed as that listed hazardous waste. To determine whether a media contains a hazardous waste, owners/operators must have complete, accurate, and historical information pertaining to past and present waste management operations at the facility. If constituents of concern in the soil cannot be linked to a process that generated a listed hazardous waste, then the contained-in policy will not apply. Unlike the mixture rule (described above), however, any media that is contaminated with a listed waste can lose its status and become non-hazardous. This

occurs when it is demonstrated that the contaminated media no longer "contains" the listed hazardous waste. This is accomplished by bringing the levels of contamination below a predetermined level established by the appropriate implementing agency. Once this demonstration is made, the media is no longer considered to "contain" a listed waste and is no longer regulated under Subtitle C.

Similarly, any contaminated media that exhibits a characteristic of hazardous waste is also considered hazardous waste and subject to regulation. A media that exhibits a characteristic of hazardous waste can be rendered non-hazardous by removing the characteristic.

Derived-from Hazardous Waste

Any residue resulting from the treatment, storage, or disposal of a listed waste is considered a hazardous waste. Examples of derived-from wastes include: ash resulting from the combustion of hazardous waste, and sludges generated from the treatment of hazardous wastewaters.

Acutely Hazardous Waste

Some hazardous wastes are considered to be "acutely hazardous." These are wastes that EPA has determined to be so dangerous in small amounts that they are regulated in the same manner as large amounts of other hazardous wastes. Acutely hazardous wastes include certain dioxin-containing wastes and those unused commercial chemical products identified as P-listed wastes. The listed wastes generated at wood preserving plants that use or formerly used chlorophenolic preservative formulations are likely to contain dioxins. EPA has determined that pentachlorophenolic wastes are toxic, not acutely hazardous.

Generators Of Hazardous Waste

As stated previously, RCRA regulates hazardous waste from the point of generation through final disposal. Hazardous waste generators are the first link in this cradle-to-grave hazardous waste management system. EPA has established comprehensive standards for generators managing hazardous waste, including standards for on-site accumulation, waste tracking, labeling, recordkeeping, and reporting requirements.

Because generators produce waste in different quantities, EPA has established three categories of waste generators:

- **Large quantity generators** (LQG) generate 1000 kilograms (kg) (approximately 2200 pounds or 300 gallons) or more of hazardous waste per calendar month or more than 1 kg (2.2 pounds) of acutely hazardous waste. Any generator that

produces greater than 1 kg of acutely hazardous waste in a calendar month must comply with all of the large quantity generator requirements. Of the three classifications of hazardous waste generators, large quantity generators are subject to the most comprehensive standards.

- **Small quantity generators** (SQG) generate between 100 and 1000 kg of hazardous waste (between approximately 220 and 2200 pounds, or 25 and 300 gallons) per calendar month. Small quantity generators are subject to a limited portion of the regulations that apply to large quantity generators. Small quantity generators may not accumulate more than 6000 kg of hazardous waste or 1 kg (2.2 pounds) of acutely hazardous waste in a month on-site at any one time. Small quantity generators who exceed this accumulation limit must comply with the regulations for large quantity generators.

- **Conditionally exempt small quantity generators** (CESQG) generate 100 kg or less of hazardous waste (approximately 220 pounds or 25 gallons) per calendar month. These generators are conditionally exempt from many of the regulations governing hazardous waste generators, provided they do not accumulate more than 1000 kg on-site at any one time and that any hazardous waste generated is sent to a State- or Federally-approved facility.

Note: *Under RCRA, many hazardous process wastewaters that are either reclaimed or sent for treatment or disposal must be counted toward a generator's monthly status. As a result, it is unlikely that many wood preserving facilities will meet this 100kg/month threshold and be considered conditionally exempt small quantity generators. Only the smallest wood preserving facilities would normally qualify for this category.*

Some State regulations may be more stringent than Federal regulations. For example, a particular State may set lower cut-off levels for generator status, or may eliminate one of the categories completely. Some States do not recognize the conditionally exempt generator category. Please consult the appropriate State implementing agency when determining the generator status of a particular facility. **Owners/operators of facilities that generate hazardous waste are responsible for making the correct generator status determination.**

Episodic Generation

Facilities that generate hazardous waste may be regulated under different rules at different times, depending on the amount of waste generated in any given month. For example, a small quantity generator that generates over 1000 kg of waste in a particular month must comply with the more extensive large quantity generator requirements for the amount of time that the waste remains on site. This fluctuating hazardous waste generation pattern is known as **episodic generation**.

Hazardous Waste Counting

In order to determine the extent to which a facility is subject to the RCRA generator regulations, each generator must "**count**" the amount of hazardous waste produced at the facility in a calendar month and determine generator status (i.e., large quantity, small quantity, or conditionally exempt). Counting involves adding up the **weight** of all quantities of characteristic and listed hazardous wastes generated at a particular facility. Wastes should only be counted once toward a generator's monthly status calculation.

Exhibit 6 may assist in deciding when a hazardous waste is to be counted when making a generator's quantity determination. EPA requires that only those wastes that are subject to "substantive regulation" be counted. Substantive regulation includes any regulation directly related to the storage, transportation, treatment, or disposal of hazardous wastes. Regulations which would not be considered substantive include requirements to notify and obtain an EPA identification number or to file a Biennial Report.

Another discussion on hazardous waste counting as it pertains to wastes specifically generated in the wood preserving industry is found in Section 4 of this Guide.

Exhibit 6
Hazardous Waste Counting

COUNTED	NOT COUNTED
• Wastes accumulated on-site for any period of time prior to their subsequent management. • Wastes packaged and transported off site. • Wastes placed directly into a regulated on-site treatment, storage, or disposal unit. • Wastes meeting the definition of F032, F034, or F035. • Wastes removed from exempt units (e.g., wastewater treatment units). • Wastes generated as sludges and removed from product storage tanks. • **Examples:** - Process residuals, sludges. - Wastewater that accumulates on the drip pad and in the collection system, e.g., drip pad sump. - When discarded: metal banding (unless recycled), wood stickers, personal protective equipment.	• Hazardous waste removed from on-site storage.* • Hazardous waste produced by on-site treatment (including reclamation) so long as the treated waste has already been counted once. • Spent materials that are generated, reclaimed, and subsequently reused on site, so long as the spent material has already been counted once. • Wastes excluded from the definition of solid waste under §261.2, i.e., wastewater discharged to a POTW or NPDES point source discharge. • Wastes excluded from regulation under §261.4(a)-(f) (e.g., arsenical treated wood that is discarded off the drip pad (261.4(b)(9). • Recyclable materials under §261.6(a)(3). • Wastes reclaimed on-site without prior storage or accumulation. • Wastes managed in exempt units (e.g., astewater treatment units). • Residues left in empty containers (empty as per §261.7). • Universal wastes managed uner Part 273.

** EPA's counting Guidelines are designed to account for those wastes that are subject to "substantive regulation." These wastes should only be counted once, and not double counted. Therefore, in this example, because hazardous wastes removed from hazardous waste storage have already been counted once, they need not be counted again (§261.5(d)).*

General RCRA Requirements for Generators of Hazardous Waste

Large and small quantity generators are subject to several specific requirements under RCRA. Regulations require generators to:

- Obtain an EPA identification number
- Properly prepare hazardous waste for transportation
- Follow accumulation and storage requirements
- Manifest hazardous waste
- Satisfy recordkeeping and reporting requirements
- Provide personnel training
- Develop contingency plans.

The specifics of the above requirements will differ depending upon a facility's generator status. Each of the requirements mentioned above is discussed in more detail below.

EPA Identification Number

Each EPA identification number consists of a series of letters and digits. The digits represent the specific facility, and the letters indicate in which State the facility is located. EPA identification numbers are obtained by filing Form 8700-12, "Notification of Regulated Waste Activity," with the appropriate EPA Regional or State RCRA office.

Without an EPA identification number, a generator cannot treat, store, dispose of, transport, or offer for transport any hazardous waste. A generator is also forbidden from offering hazardous waste to a transporter or treatment, storage, or disposal facility (TSDF) that does not have an EPA identification number. On the Federal level, conditionally exempt small quantity generators are not required to obtain EPA identification numbers; however, State policy may require conditionally exempt generators to obtain EPA identification numbers.

Pre-Transport Requirements

EPA has adopted the pre-transport regulations used by the U.S. Department of Transportation (DOT). DOT regulations require proper packaging to prevent leakage of hazardous materials, and labeling, marking, and placarding of these wastes to identify characteristics and potential dangers. For more information on DOT prepackaging requirements, consult the regulations in 49 CFR.

Accumulation Requirements

Although storage of hazardous waste generally requires a RCRA permit, RCRA allows generators to "accumulate" hazardous waste on-site without a permit as long as they comply with specific limits and standards set out for each generator category.

Large Quantity Generators

Large quantity generators may accumulate waste on-site for up to 90 days without a RCRA permit as long as:

- The waste is properly stored
- The facility has an contingency plan in place
- Facility personnel are trained in proper waste handling procedures.

Large quantity generators may only accumulate hazardous waste in containers, tanks, containment buildings, or on drip pads. Each container

and tank must be labeled with the words "hazardous waste," and generators must mark the accumulation start date on each container. Tanks need not have the start date marked on them because they are continually reused. Large quantity generators must, however, be able to demonstrate through manifests and other records that the tank has been emptied within the specified 90-day time frame.

Treatment in Generator Accumulation Units

If a generator continues to store hazardous waste for longer than 90 days, the facility will be considered a hazardous waste storage facility and must obtain a RCRA permit (see discussion of RCRA permits below). Although some States prohibit such action, under Federal regulations, generators may perform treatment (except for thermal treatment such as combustion and incineration) of hazardous waste in accumulation units under the condition that they continue to comply with the general management standards discussed above and do not exceed the 90-day accumulation time limit.

RCRA Air Emission Standards

On December 6, 1994, EPA finalized its air emission standards under RCRA to reduce volatile organic air emissions from waste management operations. These standards, known as Subpart CC, affect owners/operators managing hazardous waste with a certain volatile organic concentration in tanks, surface impoundments, and containers. Large quantity generators must comply with these regulations in order to maintain their permit-exempt status. The Subpart CC standards are in the final stages of development and are expected to become effective October 6, 1996. The Subpart CC standards do not apply to process tanks or to wastewater treatment units at wood preserving facilities. Oil-borne facilities using large tanks to store hazardous waste need to carefully consider the applicability of Subpart CC.

Small Quantity Generators

Small quantity generators may accumulate waste on-site for up to 180 days as long as:

- The on-site quantity does not exceed 6000 kg at any time
- At least one employee who is responsible for coordinating emergency responses is either at the facility or on-call at all times
- The facility has basic safety information, including the name and telephone number of the designated emergency coordinator, location of fire extinguishers, spill control materials, and the fire department phone number posted next to the telephone

- Personnel are familiar with the emergency procedures to be followed in the event of a spill or accident.

Note: *As an exception to the 180-day accumulation time period, small quantity generators may only store hazardous waste on drip pads for 90 days, but may continue to store hazardous waste in drums and tanks for up to 180 days (accumulation time is extended to 270 days if the generator must transport the hazardous waste over 200 miles for off-site treatment, storage, or disposal).*

If waste is stored in drums for longer than 180 days, the facility will be considered a storage facility and must obtain a RCRA permit (see discussion of RCRA permits below). Small quantity generators may also treat hazardous waste in accumulation units provided they comply with the general management and time limit restrictions discussed above.

Conditionally Exempt Small Quantity Generators

Conditionally exempt small quantity generators may accumulate hazardous waste on-site as long as they do not have on-site, at any one time, more than 1000 kg of hazardous waste, or 1 kg of acutely hazardous waste. At the Federal level, there are no accumulation time limits for conditionally exempt small quantity generators, and no recordkeeping, personnel training, or emergency planning is required. However, regulations require conditionally exempt generators to send their wastes to one of five types of facilities (either a State- or Federally-approved municipal or hazardous waste landfill, or a recycling facility). Conditionally exempt generators are strongly encouraged to check with their State hazardous waste agency to determine if the State has adopted more stringent standards for generators of less than 100 kg.

Satellite Accumulation

Many generators temporarily store their hazardous waste in locations at or near the point of generation before taking the waste to a central accumulation area at the facility (i.e., the "90-day area"). This **satellite accumulation** is permissible under Federal RCRA regulation, provided certain criteria are met. Generators may accumulate up to 55 gallons of hazardous waste, or one quart of acutely hazardous waste, at or near the point of generation in satellite accumulation areas without triggering the generator's "90-day clock." For example, wastes that are temporarily accumulated right outside of the retort could qualify for the satellite accumulation provision. The following requirements apply to satellite accumulation:

- Containers must be labeled as "HAZARDOUS WASTE" or with other words that identify the contents of the container.
- Once the 55-gallon limit is reached in the satellite accumulation area, the containers must be removed within 72 hours and taken to a central accumulation area.
- The 90- or 180-day facility accumulation limit begins with respect to satellite accumulation waste as soon as the waste is removed from the satellite accumulation area.
- When the 55-gallon limit is reached, generators must mark the container with the start date that excess waste started to accumulate. Generators then have three days to remove the hazardous waste to a central accumulation area where the 90- or 180- day accumulation time will begin, depending on their generator status.

EPA does not limit the number of satellite accumulation areas allowed at a particular facility, nor does it specify the type or size of containers that may be used. As long as the 55-gallon limit is not exceeded, owners/operators may use a variety of containers to accumulate wastes in a satellite area. Proper satellite areas should be designated in conjunction with the appropriate State hazardous waste agency.

Storage Requirements

Hazardous waste may be stored in 55-gallon drums, tanks, or other units suitable for the type of waste generated.

If hazardous waste is stored in **containers**:

- The container must be clearly marked with the words "HAZARDOUS WASTE" and with the date the accumulation starts.
- Containers must be kept in good condition and replaced if they begin to leak.
- Containers must be kept closed and sealed except when being emptied or filled.
- Containers must be inspected each week for leaks or corrosion.
- If a container is used to store ignitable or reactive waste, it must be placed at least 50 feet (15 meters) from the facility property line to create a buffer zone.
- Wastes that can react together must never be stored together to prevent dangerous reactions upon contact.

Generators may also store hazardous waste in **tanks**, provided they meet certain standards. All large quantity generators accumulating hazardous

waste in tanks must comply with the standards discussed in Section 7; however, small quantity generators accumulating hazardous waste in tanks are subject to special standards.

If small quantity generators are accumulating hazardous waste in tanks:

- The tank must be kept covered or, if uncovered, there must be at least two feet of space between the top of the tank and the waste being stored (unless the tank is equipped with secondary containment).
- If the tanks have equipment that allows waste to flow into them continuously, waste feed cut-off or bypass systems must be provided to stop the flow in case of problems.
- Monitoring or gauging systems must be inspected each operating day and the tanks themselves must be inspected each week for leaks or corrosion.
- For tanks containing ignitable or reactive wastes, a buffer zone must be established between the tank and the facility property line. At a minimum, buffer zones must meet appropriate National Fire Protection Association (NFPA) requirements. Owners/operators can obtain this information from the local fire department.

Combined Use of Drip Pads, Containers, and Tanks/Sumps at Wood Preserving Facilities

It is possible for a wood preserving facility to use drip pads, containers, and tanks to manage hazardous waste in the same operation. For example, waste may be generated and accumulated on a drip pad for a short period of time, then drained to a collection tank or sump. In addition, many owners/operators also keep a drum located at the edge of the drip pad to capture debris and residues that do not drain into the collection unit and are picked up off the drip pad.

In combined use situations, it is important to know the regulatory status of all waste accumulation units. The drip pad is specifically identified as an accumulation unit in the RCRA regulations. The RCRA drip pad standards require that all tanks and sumps used as drip pad collection units meet the RCRA tank standards in Subpart J. As a result, these tanks/sumps will also be subject to Subtitle C controls. Although it is possible for these tanks to be fully regulated, collection tanks can be a part of a facility's wastewater treatment system and thus exempt from RCRA regulation. RCRA provides an exemption from regulations for wastewater treatment units. If this is the case, the tank or sump would not be regulated under Subpart J, but would be subject to regulation under the Clean Water Act.

To take advantage of the wastewater treatment unit exemption, the tank has to be part of a system that is either discharging to a publicly-owned treatment work (POTW) or subject to a National Pollutant Discharge Elimination System (NPDES) zero discharge permit. It is the responsibility of the facility's owner/operator to make these kinds of determinations in conjunction with the appropriate State authority.

Containers that are kept on the edges of drip pads to collect materials such as debris may be considered satellite accumulation areas under RCRA. RCRA allows owners/operators to accumulate up to 55 gallons of hazardous waste in areas at or near the point of generation before it is transferred to a central accumulation unit.

Manifest Requirements

A generator who transports, or offers for transportation, hazardous waste for off-site treatment, storage, or disposal must prepare a Uniform Hazardous Waste Manifest (Form 8700-22A). Manifests allow generators, as well as regulators, to track the movement of hazardous waste from its point of generation to the point of ultimate treatment, storage, or disposal. Each party that handles the waste must sign the manifest and retain a copy. Once the transport is complete, the receiving facility must return a signed copy of the manifest to the generator (within 60 days for small quantity generators, and within 45 days for large quantity generators). If no copy of the signed manifest is received by the generator, an exception report must be filed.

RCRA manifests contain the following information:

- Name and EPA identification number of the generator, transporter, and the designated TSDF
- DOT description of the waste
- Quantity of waste
- Address of the designated TSDF to which the waste is being transported
- Certification that the generator has in place a program to reduce the volume or toxicity of waste and that the treatment, storage, and disposal method chosen by the generator is the most practical method currently available.

Personnel Training

Large and small quantity generators must satisfy certain personnel training requirements. These requirements help to ensure that all employees in contact with hazardous waste are knowledgeable of the dangers involved and educated on proper waste handling procedures and precautions.

Large quantity generators are subject to the same personnel training requirements as permitted RCRA facilities. To fulfill these requirements, facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a safe and effective manner. Employees must complete the program within six months after beginning their employment and must take part in an annual review of the initial training. Small quantity generators are not required to satisfy these requirements, but are responsible for ensuring that facility personnel are instructed in proper waste handling procedures. Conditionally exempt small quantity generators are not subject to personnel training requirements.

Contingency Plans

Generators are required to have a contingency plan in place at the facility that outlines the proper response procedures necessary to minimize hazards posed by fires, explosions, or unplanned releases of hazardous waste from the facility. Similar to personnel training requirements, large quantity generators are subject to the same contingency plan requirements as permitted facilities. Details of the precautionary measures that must be taken are found in the regulations. Extensive plans are not required for small quantity generators; rather, small quantity generators must construct a modified version of the plan. Conditionally exempt small quantity generators are not required to have contingency plans.

Recordkeeping and Reporting Requirements

Hazardous waste generators must satisfy several recordkeeping and reporting requirements. Large quantity generators who transport hazardous waste off-site must submit a **biennial report** to the EPA Regional Administrator (or State director if the State is authorized to implement the hazardous waste program) by March 1 of each even-numbered year. This report details the generator's activities during the previous calendar year, including the quantity and nature of the hazardous waste generated; and the name, address, and EPA identification number of each TSDF to which waste was sent and each transporter who handled the waste for the facility. The report must also describe the facility's efforts to reduce the volume and toxicity of the wastes generated and the changes in volume and toxicity actually achieved compared to previous years **(waste minimization report)**. Neither small quantity generators nor conditionally exempt small quantity generators are required to submit a biennial report.

To ensure the safe and efficient transport of hazardous waste to off-site facilities, RCRA requires facilities to return a signed copy of the manifest

to the generator within a certain time frame. Small quantity generators must receive a copy within 60 days, large quantity generators within 45 days. Owners/operators who do not receive a copy of the manifest signed and dated by the TSDF within the appropriate time period must submit an **exception report**. Although there is no specific form, the contents of the exception report are specified in the regulations. Conditionally exempt small quantity generators are not required to prepare a manifest, and thus are not subject to the exception reporting requirements.

Generators must keep signed copies of manifests for at least three years from the date waste was accepted by the initial transporter. The generator must also retain a copy of each biennial report for three years from the due date of the report. In addition, a generator must keep records of any test results or waste analyses for at least three years. The three-year period for retention of records is automatically extended during an enforcement action.

Exhibit 7 summarizes the different regulatory requirements for large quantity, small quantity, and conditionally exempt generators.

Exhibit 7
Requirements for Wood Preserving Facilities that are Generators of RCRA Hazardous Waste

	Large Quantity	Small Quantity	Conditionally Exempt
Hazardous Waste Quantity Limits (per calendar month)	[3]1000 Kg hazardous waste or [3] 1 Kg acute hazardous waste	Between 100-1000 Kg hazardous waste	< 100 Kg or < 1 Kg acute hazardous waste
Waste Determination	Yes	Yes	Yes
EPA ID Number	Yes	Yes	No
On-Site Accumulation Quantity Limits	None	[2] 6000 Kg	[2] 1000 Kg [2] 1 Kg acute hazardous < 100 Kg spill residue from acute HW
Accumulation Time	[2] 90 days	[2] 180 days* ([2] 270 days if travel to waste management facility is > 200 miles)	None
Storage Requirements	Comply with <u>all</u> Part 265 management standards for tanks, containers, drip pads, and containment buildings	Comply with <u>basic</u> technical requirements for tanks and containers*	None
Off-Site Waste Management	RCRA permitted or interim status HW facility	RCRA permitted or interim status HW facility	State approved or RCRA permitted/interim status facility <u>or</u> recycling facility
Contingency Plan	<u>Full</u> plan to minimize hazards from fires, spills, explosion	One person at the facility at all times responsible for coordinating emergency responses	None
Storage Yard Cleanup Plan	Yes	Yes	No
Subpart W Drip Pad Standards	Yes	Yes	No**
Treatment on Site without a RCRA Permit	Yes (except for thermal treatment such as combustion and incineration)	Yes (except for thermal treatment such as combustion and incineration)	No, unless the CESQG is also one of the types of waste management facilities specified above
Manifest	Yes	Yes	No
Biennial Report	Yes	No	No

Exhibit 7
Requirements for Wood Preserving Facilities that are Generators of RCRA Hazardous Waste

	Large Quantity	Small Quantity	Conditionally Exempt
Recordkeeping	• Manifests • Biennial reports • Exception reports • Test results • Records of past management practices • Records of storage yard cleanup • Documentation if any past decontamination of equipment to eliminate waste codes	• Manifests • Exception reports • Test results • Records of past management practices • Records of storage yard cleanup • Documentation if any past decontamination of equipment to eliminate waste codes	None
Personnel Training	Formal classroom training with annual updates	Employees must be familiar with waste handling and emergency procedures relevant to their position	None

Generators of between 100-1000Kg hazardous waste per calendar month (small quantity generators) who utilize drip pads **must comply with the standards for large quantity generators for the management of wastes on drip pads. This means that small quantity generators can only accumulate hazardous waste for 90 days. This exception does not apply to the management of drummed wastes, which are still subject to the 180-day accumulation time.*

***Although Federal RCRA regulations do not specifically require conditionally exempt small quantity generators to comply with the Subpart W drip pad standards, owners/operators of these facilities should note that any hazardous waste that is allowed to accumulate on the ground (i.e., allowed to drip off of a charge and onto the ground in the storage yard) can be considered illegal disposal of hazardous waste and subject to enforcement action. Therefore, it is advisable that conditionally exempt generators manage their process in a manner that does not allow preservative or waste to contact the ground.*

Land Disposal Restrictions

The RCRA Land Disposal Restrictions (LDR) require that hazardous waste must meet specified treatment levels in order to be disposed of on the land. An example of land disposal is the placement of wastes into a landfill or lagoon. EPA has assigned each waste code identified under RCRA a specific **treatment standard** that must be met before land disposal can occur. Treatment standards can be expressed in two ways: (1) as a specific technology (e.g., combustion, vitrification) that must be applied to the waste in order to meet the standard, or (2) as specific concentration levels. Facilities managing wastes with treatment standards expressed as concentration levels may perform any type of treatment on the waste stream to achieve the standard (keep in mind however, that a generator cannot perform thermal treatment, such as incineration or combustion, unless they obtain a RCRA permit). EPA does not allow the dilution of hazardous waste to meet LDR treatment standards.

Wastes which do not meet treatment standards cannot be land disposed unless EPA has granted a variance, extension, or exclusion for a particular waste stream. Also, certain newly identified wastes (those identified on or after November 8, 1984) have not yet been assigned treatment standards. This is because EPA needs time to determine the best methods available to treat these wastes in order to establish treatment standards. Until a treatment standard has been developed, these wastes will not be subject to LDR. Certain F-listed wastes from the wood preserving industry (i.e., F032, F034, and F035) are among the wastes for which EPA has not yet identified treatment standards. Until these treatment standards are finalized, these wood preserving wastes are not subject to LDR treatment standards. In addition, other wastes generated in the wood preserving industry, such as K001, already have treatment standards. K001, which is described in the listing as bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol, does have an established numerical treatment standard.

Generators and TSDFs managing hazardous wastes that are subject to LDR have specific notification, certification, waste analysis, and recordkeeping requirements. Similar to a hazardous waste manifest, LDR notification and certification paperwork helps hazardous waste handlers and EPA ensure that wastes are being properly treated before land disposal.

Waste Subject to LDR Requirements

Generators are responsible for determining whether their waste is subject to LDR. This is accomplished by either testing the waste or by applying generator process knowledge. If a waste is subject to LDR but does not meet the applicable treatment standards, generators must provide written notification to the TSDF to which the waste is being sent. Although there is no specific LDR notification form, EPA does require specific information to be included in the notice, including:

- EPA hazardous waste code
- Identification of the waste as a wastewater or non-wastewater
- Manifest number of the shipment
- Waste analysis information (if available)
- For certain specified wastes, any additional hazardous constituents present in the waste.

If an LDR waste does meet applicable treatment standards, the generator must certify to the receiving TSDF that the waste meets the required

treatment standards. Generators must keep a copy of all notifications and certifications for at least five years.

Generators may treat their waste on-site to meet LDR treatment standards. To do so, they must first develop a written waste analysis plan (WAP). The WAP must justify the frequency of testing based on a detailed analysis of a representative sampling of the waste, and contain information necessary for proper treatment of the waste. Generators who perform on-site treatment of hazardous waste that is unrelated to LDR treatment standards are not required to develop a WAP.

RCRA Permitting

Permits are an essential part of the RCRA Subtitle C program. RCRA requires facilities that treat, store, or dispose of hazardous waste to obtain an operating permit. A permit establishes site-specific administrative and technical hazardous waste management standards to which a TSDF must adhere.

Permit Exemptions

There are limited circumstances under which a facility can treat, store, or dispose of hazardous waste without a permit:

- Large quantity generators storing hazardous waste on site for less than 90 days, and small quantity generators storing hazardous waste on site for less than 180 days
- Owners/operators of totally enclosed treatment facilities, wastewater treatment units, and elementary neutralization units
- Persons engaged in containment activities during an emergency response (e.g., spills, accidents)
- Owners/operators of solid waste disposal facilities handling only conditionally exempt small quantity generator wastes.

Any facility that does not qualify for a permit exemption and that treats, stores, or disposes of hazardous waste must obtain a RCRA permit. Because treatment, storage, and disposal generally involve several different types of units and multiple activities, the permitting regulations impose requirements far more extensive than those imposed upon a generator. As a result, many facilities in the wood preserving industry have made a concerted effort to maintain generator status to avoid having to apply for and adhere to the requirements of a permit. In light of recent waste minimization efforts, this has become increasingly easier to accomplish.

Permitting Standards

RCRA permitting standards consist of both general TSDF standards as well as unit-specific standards. The general RCRA TSDF standards require facilities to:

- Conduct detailed chemical and physical analyses of waste managed at the facility
- Install security measures to protect human health, safety, and the environment
- Develop and conduct a written facility inspection plan
- Ensure that facility personnel are trained to handle any hazardous waste with which they may come into contact
- Properly manage all wastes to minimize the chance of ignition, reaction, or explosion
- Comply with standards prohibiting the siting of a facility in areas prone to flooding or seismic activity
- Develop emergency preparedness and contingency plans
- Comply with general manifesting, recordkeeping, and reporting requirements.

All new facilities requiring a RCRA permit must apply for, and receive, a permit before construction of the facility can begin. Owners/operators of existing facilities must operate under RCRA's **interim status** standards while seeking a permit or awaiting permit approval by EPA. With few exceptions, RCRA's interim status standards are very similar to the permitting standards.

Permit Applications

RCRA permit applications are lengthy and comprehensive, consisting of two parts: Part A and Part B. Both parts of the application provide EPA with the information necessary to establish site-specific requirements. The Part A application is submitted on Form 8700-23, and consists of basic facility information such as the name, mailing address, and location of the facility. The Part B application is the more complex, narrative part of the permit application in which the applicant describes, in great detail, the types of wastes that will be managed at the facility, precautionary measures that will be taken to protect human health and the environment, and all waste analysis, facility inspection, and contingency plans that will be part of everyday activities of the facility.

Once EPA receives this information, the application is reviewed, presented for public comment, then approved or denied. All RCRA permits are effective for a fixed term, not to exceed ten years. At that time, the permit may be modified, reissued, or terminated.

Wood Preserving Facilities and Permits

The process of obtaining a RCRA treatment, storage, and disposal permit is difficult and lengthy, sometimes taking two years or more to complete. Wood preserving facilities can, and often do, avoid the need to obtain a RCRA permit by maintaining their permit-exempt status as a hazardous waste generator. To do this, a facility must ensure that any waste generated at the facility is removed and sent to a permitted or interim status TSDF within the appropriate time frame (within 90 days for large quantity generators and within 180 days for small quantity generators). Because most wood preserving facilities do not generate large volumes of waste, the majority of facilities do not find it difficult to remain exempt from permitting requirements.

Closure Requirements at Permitted Facilities

All hazardous waste management facilities eventually cease their treatment, storage, or disposal activities. When ceasing operation, these facilities must be closed and maintained in a way that ensures that they do not pose a future threat to human health and the environment.

Closure regulations can be divided into two parts: general closure standards and unit-specific standards. General closure standards apply to all TSDFs entering into closure. Unit-specific standards address the specific types of waste management units regulated under RCRA. Both general and unit-specific standards must be satisfied to complete closure activities. The maximum time allowed to complete closure after the unit has received its final volume of waste is 180 days. Extensions to this 180-day time period may be granted under certain circumstances by the EPA Regional Administrator. All TSDFs must submit closure plans explaining, in detail, how the facility will achieve the closure standards. Permitted facilities must submit this plan with their Part B permit application. Interim status facilities must have written closure plans on-site six months after they become subject to the RCRA TSDF standards.

Each closure plan must:

- Describe how each hazardous waste management unit at the facility will be closed
- Estimate the maximum inventory of hazardous waste that will be on-site during the facility's operating life
- Describe closure methods necessary to remove and manage waste present at the facility
- Describe any other steps necessary to achieve complete closure
- Contain a schedule of closure dates, including the amount of time each closure activity will take

- Contain an expected date of final closure.

Post-Closure Requirements

Owners/operators who cannot "clean close" their facility by removing or decontaminating all equipment, structures, and soils must also enter into a period of post-closure care to prevent or control any future releases into the environment. Post-closure is normally a 30-year period after closure during which owners/operators must conduct groundwater monitoring and maintenance activities to prevent releases. Facilities entering into post-closure must obtain a post-closure permit, and must also submit a post-closure plan to the EPA Regional Administrator describing how these activities will be conducted.

Closure of Wood Preserving Facilities

Wood preserving facilities that maintain generator status under RCRA are subject to limited closure requirements. Large quantity generators must close their accumulation units in a manner that minimizes or eliminates post-closure release of hazardous waste into the environment, and must dispose of or decontaminate equipment, structures, and soils at the facility.

Small quantity generators are not subject to generic closure requirements; instead, small quantity generators must comply with applicable unit-specific closure requirements contained in the regulations. For example, at closure, all accumulated hazardous waste and residues must be removed from drip pads, treatment equipment, discharge equipment, discharge control equipment, and discharge confinement structures. Small quantity generators accumulating hazardous waste in tanks must also comply with the appropriate tank closure requirements.

Note: *Small quantity generators accumulating hazardous waste on drip pads must comply with the regulations applicable to large quantity generators. Thus, they are subject to the general closure requirements applicable to large quantity generators discussed above.*

Hazardous wastes generated from closure activities must be handled according to applicable RCRA regulations. EPA has not established specific Federal cleanup levels to verify "clean closure." Many States, however, have established risk-based cleanup levels depending upon projected land use at the facility. Thus, facilities must work closely with their implementing agency to determine specific levels of decontamination that will ensure the protection of human health and the environment.

Underground Storage Tanks

RCRA's Underground Storage Tank (UST) program establishes a comprehensive regulatory scheme for the management of USTs storing petroleum and hazardous substances as defined under CERCLA. The regulations establish minimum standards for new tanks and require owners/operators of existing tanks to either upgrade, replace, or close them according to the regulations.

The regulations are divided into two parts. The first part contains technical requirements designed to reduce the chances of releases from USTs, detect leaks and spills when they occur, and secure prompt cleanup in the event of a release. The second part of the UST regulations consists of financial responsibility requirements to ensure that, in the event of a spill or leak from an UST, a facility will have the financial resources to pay for cleanup and compensate any third parties involved. The financial responsibility requirements apply only to USTs containing petroleum.

Most wood preserving facilities are not subject to the UST regulations; in fact, the definition of "regulated substance" as it applies to the UST program specifically excludes RCRA hazardous wastes. This is because RCRA already has standards regulating the management of tanks containing hazardous waste, whether underground or above ground. As a result, tanks accumulating hazardous waste at a wood preserving facility, even if underground, are not subject to the UST regulations. If, however, a wood preserving facility does have an underground storage tank (defined as a tank system whose volume is 10 percent or more below the surface of the ground) on-site that contains petroleum or hazardous substances as defined under CERCLA, it may be subject to the UST regulations.

Although there are no Federal RCRA standards for the management of products in aboveground tanks, States may have established such requirements.

State Authorization

The RCRA program grants certain States authorization to implement the Federal hazardous waste regulations. To receive authorization, States must demonstrate to EPA that their regulatory program is equivalent to Federal authority, consistent with the Federal program, and at least as stringent as the Federal regulations. Following such authorization, State regulations operate in lieu of the Federal program in that State.

State authorization can be divided into two major categories: the "base program" and "revisions." Before States can implement any part of the Federal RCRA regulations, they must first obtain base authorization, which

allows a State to implement the fundamental requirements of the RCRA program (generally anything published prior to April 1, 1983), such as generator standards, hazardous waste identification standards, and basic permitting provisions. For those States that do not have base authorization (currently this list includes Iowa, Hawaii, Alaska, and some U.S. territories), EPA implements the entire hazardous waste management program.

Once a State receives base authorization, it must continue to revise its program to incorporate frequent revisions to the RCRA regulations to retain its authorized status. Because revisions to the Federal hazardous waste management program consist of hundreds of individual rulemakings, EPA has segmented the Federal program into different groups, or **clusters**. A State may not incorporate clusters of rules into its program until it receives base authorization.

Note: *Individual States may incorporate provisions into their own programs that have no counterpart in the Federal program. These additional elements of a State's program are not considered to be part of the Federal RCRA program, and are not subject to State authorization procedures.*

Most States are not authorized for all clusters of hazardous waste revisions. Therefore, the status of rulemakings that a State has not "picked up" (been authorized for) depends on the statutory authority upon which those rulemakings are based. For example, some rulemakings will be effective immediately in all States, regardless of the rules' authorization status in that State. Other rulemakings, however, must be picked up by an individual State before they can become effective in that State. A discussion of this aspect of State authorization is found below.

Within the State authorization program, it is important to distinguish between those rulemakings that are published as a result of original RCRA language (i.e., from statutory language from 1976), and those published pursuant to the Hazardous Solid Waste Amendments of 1984 (HSWA). Prior to the enactment of HSWA, a State with final authorization administered its hazardous waste program entirely in lieu of the Federal program. Federal requirements no longer applied in the authorized State, but were incorporated into the individual State's hazardous waste program. When new, more stringent requirements were enacted, the State was obligated to enact equivalent authority within specified time frames. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law. Some Federal rules are still issued based on the original pre-HSWA authority, and

become effective in authorized States (those States which have been base authorized for rules published prior to April 1, 1983) only when the State adopts the provisions as State law. These rules are known as "non-HSWA" rulemakings.

In contrast, HSWA of 1984 amended RCRA and changed the State authorization regulations. Under the revised program, any new requirements or prohibitions imposed by HSWA take effect immediately in **all** States upon the effective date of the standards, regardless of a State's authorization status. In those States that do not have base authorization, EPA will implement the program until the State is granted the authority to do so. Rulemakings that are developed pursuant to HSWA are called HSWA rulemakings. Exhibit 8 illustrates the difference between HSWA and non-HSWA rulemakings. The difference between HSWA and non-HSWA rulemakings is important in determining the status of wood preserving wastes in a particular State.

Exhibit 8
Relationship Between State Authorization Status and HSWA/Non-HSWA Rulemakings

State Authorization Status	Statutory Basis for Rulemaking	
	Non-HSWA	HSWA
Authorized State (authorized for base RCRA program)	Effective date = Date when State became authorized for rule, implementation of rule by State	Effective date = Date of rule, EPA implements until State adopts rule
Unauthorized State (no authorization for base RCRA program)	Effective date = Date of rule, implementation of rule by EPA	Effective date = Date of rule, implementation of rule by EPA

Additional information is available on the subjects discussed above:

- For general information on RCRA, refer to EPA's RCRA Orientation Manual, 1990 Edition, EPA/530-SW-90-036.

- For information on the specific regulations, consult the following sections of the Code of Federal Regulations:

  - Definition of Solid Waste — 40 CFR §261.2
  - Definition of Hazardous Waste — 40 CFR §262.11
  - Characteristic Waste — 40 CFR §§261.20-261.24
  - Listed Waste — 40 CFR §§261.31-261.33
  - Hazardous Waste Mixtures — 40 CFR §261.3(a)(1)(iv)
  - Derived-From Hazardous Waste — 40 CFR §261.3(c)(2)
  - Hazardous Waste Counting — 40 CFR §261.5
  - Generators of Hazardous Waste — 40 CFR Part 262
  - Accumulation Time/Storage Limits — 40 CFR §262.34
  - Satellite Accumulation — 40 CFR §262.34(c)
  - Conditionally Exempt Small Quantity Generators — 40 CFR §261.5
  - EPA Identification Numbers — 40 CFR §262.12
  - Pre-Transport Requirements — 40 CFR §§262.30-262.33; 49 CFR Parts 172, 173, 178, and 179
  - Manifest Requirements — 40 CFR §262.20
  - Recordkeeping/Reporting Requirements — 40 CFR §§262.40-262.43
  - Hazardous Waste Under RCRA — 40 CFR Part 261
  - Permitting Under RCRA — 40 CFR Part 270
  - Exemptions From Permitting — 40 CFR §270.1(c)(3)
  - Exemptions from Definition of Solid Waste/Hazardous Waste — 40 CFR §261.4
  - RCRA General TSDF Standards — 40 CFR Part 264/265, Subparts A-H
  - Permit Application Process — 40 CFR Part 270, Subpart B
  - Land Disposal Restrictions — 40 CFR Part 268
  - LDR Notification Requirements — 40 CFR §268.7
  - Waste Analysis Plans — 40 CFR §268.7(a)(4)
  - Closure and Post-Closure — 40 CFR Parts 264/265, Subpart G §262.34 (generator closure)
  - Underground Storage Tanks (USTs) — 40 CFR Part 280
  - State Authorization — 40 CFR Part 271.

- For more information on EPA's contained-in policy, consult the regulatory interpretive correspondence dated June 16, 1989, written from Cannon to Jorling. This memorandum is also a part of the RCRA Permit Policy Compendium, #9441.1989(30).

- For more information on episodic generation and hazardous waste counting, consult the March 24, 1986, Federal Register (51 FR 10146; March 24, 1986).

- For more information on the Toxicity Characteristic Leaching Procedure (TCLP), consult the March 29, 1990, Federal Register (55 FR 11798; March 29, 1990) and the Technical Assistance Document for Complying with the TC Rule and Implementing the Toxicity Characteristic Leaching Procedure (TCLP) (Revised May 1994) EPA, 902-B-94-001.

SECTION 4
RCRA WASTE GENERATED BY WOOD PRESERVING

Introduction

The wastes produced from the wood preserving processes discussed in Section 2 have been the subject of substantial regulatory action in recent years. In 1990, EPA issued final regulations that specifically listed wood preserving wastes from facilities that use chlorophenolic formulations, creosote formulations, and inorganic preservatives containing arsenic or chromium. The types of wastes identified include wood preserving wastewaters, process residuals, preservative drippage, and spent preservatives. In addition to these specific identified wood preserving wastes, wood preserving facilities can also generate other "listed" and "characteristic" wastes depending on the processes and chemicals used. Listed and characteristics wastes, as defined under RCRA, are discussed in Section 3 of this Guide.

This section of the Compliance Guide discusses three general types of hazardous waste generated by wood preserving facilities: wastewaters; process residuals; and preservative drippage. It also discusses some of the exclusions from RCRA that may apply to these wastes at various stages of the wood preserving.

Health Concerns of Wood Preserving Wastes

Wastes from the wood preserving industry can be considered hazardous because they are listed as a hazardous waste or they exhibit a characteristic of hazardous waste. EPA has data demonstrating that constituents found in wastes generated by the wood preserving process, such as chlorophenolics, creosote, and inorganics (i.e., arsenic and chromium) are systemic toxicants and/or carcinogens. Systemic toxicants are constituents that may have long-term chronic effects other than cancer or mutations. Carcinogens are constituents that have the potential to cause cancer. Some of these wastes may also contain high levels of dioxins. Given the high concentrations of these chemicals typically present in wastes produced by the wood preserving industry, the potential for harmful exposure to human if chemicals are mishandled, can be significant. Potential for exposure is most likely to occur through contact with contaminated groundwater or chronic occupational exposure.

For example, previous studies of pentachlorophenol have shown it to be highly toxic to humans. Exposure to pentachlorophenol can cause contact dermatitis, damage to vision, and upon ingestion, lung, liver, and kidney damage. Inhalation of pentachlorophenol can result in acute poisoning,

centering on the circulatory system with possible accompanying heart failure. Other studies have also shown pentachlorophenol to be a carcinogen.

One of the most commonly used preservatives in the wood preserving industry is chromated copper arsenate, or CCA. This formulation contains water, arsenic acid, chromic acid, and copper oxide. Overexposure to CCA can damage mucous membranes and tissues of the respiratory system, or cause chemical burns on the skin or skin lesions. Ingestion of large amounts of CCA may have more serious effects. Chronic exposure to significant doses of CCA can lead to mental confusion, loss of coordination, and impaired senses of touch, pain, and temperature. CCA is also considered a possible carcinogen.

Due to these and other health concerns, EPA found it necessary to specifically identify wood preserving wastes as hazardous under RCRA.

Exhibit 9 provides an overview of the material inputs and pollution outputs from the Wood preserving process.

Exhibit 9
Wood Preserving Process Inputs and Pollution Outputs

Material Input	Air Emissions	Process Waste	Other Waste
Wood; water; carrier oils; creosote; inorganic formulations of arsenic, chromium, copper, zinc; penta-chlorophenol; borates; ammonium compounds	Boiler emissions, air-borne arsenic, polycyclic organics, penta-chlorophenol, volatile organic compounds from carrier oils and creosote	Dripped formulation mixed with rainwater, wash down water, detergent, kiln condensate, contact cooling water	Sump and retort sludges, process residuals including discarded clothing and gloves, banding, wood stickers, saw dust and splinters from the drip pad, contaminated soils from storage yard clean-up

Wastewater

Wastewaters produced during the wood preserving process that are regulated under RCRA can be generated during various stages of wood preserving operations.These include wastewater generated during steam conditioning wood in treatment cylinders prior to applying preservative, preservative formulation recovery and generation wastewater, water used to wash excess preservative from the surface of preserved wood while

sitting on the drip pad, washdown water used to clean drip pads, and condensate from kilns used to dry preserved wood.

Other operations resulting in the generation of wastewater include the rinsing of drums, storage tanks, process areas, and equipment. In addition, water, **including rainwater**, that accumulates on drip pads and in retort sumps, and rainwater falling on or in the treatment cylinder and work tank secondary containment areas, is also classified as hazardous waste.

Most wastewater generated at wood preserving facilities is considered hazardous waste under RCRA either because it is mixed with a listed waste or because it exhibits a characteristic of hazardous waste. As a result, many of the tanks and other units in which these wastes are collected, stored, accumulated, treated, and/or disposed will be subject to RCRA regulation (a more detailed explanation of regulations concerning management of hazardous waste in tanks is provided in Section 6 of this Guide).

Note: *Many tanks or sumps that are used to accumulate or treat wastewaters from wood preserving may, in fact, be excluded from RCRA regulation. Wastewater treatment units subject to regulation under the Clean Water Act are exempt from RCRA standards. As a result, tanks and sumps used to collect wastewaters may not be subject to any standards. Check with the appropriate State hazardous waste agency to determine the applicability of this exemption.*

Much confusion exists as to which wastes generated at wood preserving facilities should be counted. Whether wastewater is counted toward a facility's generator status will depend on a number of factors. Specific hazardous waste counting issues as they relate to the wood preserving industry are discussed elsewhere in this section (See Exhibit 6, Hazardous Waste Counting).

Note: *Wastewater that does <u>not</u> come into contact with preservative solutions is not regulated as listed waste under RCRA. Wastewaters can, however, exhibit a characteristic of hazardous waste depending on the hazardous constituents in the wastewater.*

Process Residuals

Materials such as sawdust, wood chips, splinters, equipment and parts, tags, labels, sand, dirt, and stones, that are attached to wood when it enters the retort are often washed off during the treatment process. These

materials can form a residue in the retort and may settle out of the preservative solution elsewhere in the process (e.g., in work tanks, retorts, or sumps). They may also be intentionally filtered out of the preservative prior to reuse in the treatment process. Other process residuals include discarded personal protective equipment (e.g., gloves, clothing, tyvec suites, boots that have come into contact with preservative), used banding (that is not being recycled), and wood stickers. All of these wastes are considered process residuals and must be handled as hazardous waste under RCRA if they have contacted listed wastes or if they exhibit a characteristic of hazardous waste.

Determining exactly when these materials are generated for purposes of making a hazardous waste determination and complying with appropriate management standards can be complicated and site-specific. Where process residuals are continually deposited at the bottom of a work tank or sump, hazardous waste is not generated until the work tank/sump/pit is cleaned out and the sludge is removed. At the time the sludge is removed, owners/operators must determine whether the waste is hazardous.

The generation of process residuals can be significantly reduced by employing waste minimization practices at wood preserving facilities. For example, by power washing incoming lumber or by accepting only clean, high grade lumber for treatment, owners/ operators can minimize the amount of hazardous process residuals generated.

Drippage and Process Residuals

Preservative drippage and process residuals may also accumulate on drip pads, in pathways over which treated wood is transported, and in treated wood storage yards. This category of waste includes drippage of preservative from treated wood, preservative that is washed off treated wood by rainwater, and residuals from collecting and recycling preservative that drips off or is washed off treated wood.

Note: *Preservative that is washed off treated wood in storage yards by rainwater is not specifically identified as a RCRA listed waste, but it may exhibit a hazardous waste characteristic. In addition, although the Subpart W drip pad standards do not apply to storage yard drippage, drippage of excess preservative that occurs in storage yards may be covered by the hazardous waste listings discussed below if certain chemical formulations are used, and must be cleaned up immediately in accordance with the facility's contingency plan for storage yard drippage (for a more detailed discussion of EPA's regulation of storage yards, see Section 6).*

Contaminated Clothing and Other Materials

Personnel working at wood preserving facilities often produce contaminated personal protective equipment (PPE) such as disposable cover-alls, clothing, gloves, boots, and other materials (e.g., trash). These items are commonly sent for disposal or to a laundering facility so they can be cleaned and used again.

Contaminated materials that are sent for disposal must be handled as RCRA hazardous wastes and manifested to a permitted or interim status TSDF. Contaminated materials that are sent to a laundering facility should be handled in a safe and protective manner. Owners/operators of wood preserving facilities should ensure that the laundering facility is instructed on safe handling procedures, that it segregates contaminated materials from others, and that the laundering facility's POTW is aware of the contaminated items and what kinds of chemicals they contain. This will enable the operator of the laundering facility to make all necessary arrangements to comply with Clean Water Act (CWA) requirements.

Hazardous Wastes Generated by Wood Preserving Operations

There are several EPA-classified hazardous wastes that may be generated during, or as a result of, wood preserving operations:

- **F027** — discarded unused pentachlorophenol.
- **F032** — wastewaters, process residuals, preservative drippage, and spent formulations from plants that use or have used chlorophenolic formulations. This listing applies to those facilities using "penta" wood preserving formulations.
- **F034** — wastewater, process residuals, preservative drippage, and spent formulations from plants that use creosote formulations.
- **F035** — wastewater, process residuals, preservative drippage, and spent formulations from plants that use inorganic preservatives containing arsenic or chromium.
- **K001**— bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote or pentachlorophenol.
- **U051** — discarded unused creosote.
- **Characteristic Wastes** — constituents included in the toxicity characteristic that may be generated by the wood preserving industry include arsenic (D004), chromium (D007), lead (D008), pentachlorophenol (D037), and wastes containing cresols (D023, D024, D025, D026). Wastes generated at wood preserving facilities may also exhibit the characteristic of corrosivity (D002). This is not an exhaustive listing of all possible waste codes that may

apply. Owners/operators must evaluate their specific waste streams against the toxicity characteristic constituents.

- **K035** — wastewater treatment sludges generated in the **manufacturing** of creosote (this listing **does not normally apply to wood preserving facilities**).

Wastes that meet any one of the above descriptions must be handled, stored, and disposed of according to RCRA regulations.

Note: *Most wood preserving facilities maintain tank farms where preservative is stored before use. Although these tanks are not holding hazardous waste, leaks from tanks and valves have the potential to be classified as listed or characteristic wastes under RCRA. For example, unused pentachlorophenol, when leaked, will carry the waste code F027, while unused creosote will carry the waste code U051. In addition, any chemical that is leaked or spilled at a tank farm may exhibit a characteristic of hazardous waste.*

Exhibits 10 and 11 illustrate the types of wastes typically generated by the wood preserving industry. This exhibit is intended to give owners/operators of wood preserving facilities a general idea of possible hazardous waste codes being generated at a facility according to the type of preservative used.

Exhibit 10
Codes of Hazardous Waste Generated at Wood Preserving Facilities

Preservative	F03	F034	F03	K00	F02	D05	Toxicity Characteristic(TC)*	Not Considered Hazardous By US EPA
OIL-BORNE FACILITIES								
Creosote		**T**		**T**		**T**	D023, D024, D025,	
Pentachlorophenol	**T**			**T**	**T**		D026	
Copper Napthenate							D037	**T**
WATER-BORNE FACILITIES								
Ammoniacal Copper Arsenate (ACA)			**T**					
Chromated Copper Arsenate (CCA)			**T**				D004, D008	
Oxine Copper							D004, D008, D007	
Ammoniacal Copper Citate (CC)								
Copper Dimothyldithiocarbamate (DDC)			**T**					
Ammoniacal Copper Zinc Arsenate (ACZA)			**T**					
Acid Copper Chromate (ACC)								**T**
Borates								**T**
Ammoniacal Copper Quat (ACQ)								**T**

Note: This chart contains only suggested hazardous waste codes under the toxicity characteristic. All of these presentations may contain other hazardous constituents that would cause it to exhibit the TC for another hazardous constitutent.

* *See 40 CFR §261.24 for a complete list of constituents identified under the toxicity characteristic.*
** *Facility is required to make a hazardous waste determination prior to disposal as non-hazardous waste (§262.11).*

Exhibit 11
Wood Preserving Hazardous Waste Code Identification Table

	LISTED HAZARDOUS WASTES						TOXICITY CHARACTERISTICS WASTES***								
							Note: This general guidance may not be accurate in all cases.								
WASTE	**F032**	**F034**	**F035**	**K001**	**F027**	**U051**	**D002**	**D004**	**D007**	**D008**	**D023**	**D024**	**D025**	**D026**	**D037**
Wastewater Treatment Unit Sludge															
penta				X											X
creosote				X							X	X	X	X	
Dump Sump Sludge															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					
Filter Sludge															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					
Wastewater															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					
Process Residuals**															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					
Storage Yard Clean-up Material															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					
Discarded Treated Wood End User/Customer															
penta															X
creosote											X	X	X	X	
inorganics*							X			X					
Discarded Unused Preservative (concentrate)															
penta					X										
creosote						X									
inorganics*							X	X	X	X					
Tank Clean-out Bottoms															
penta	X														X
creosote		X									X	X	X	X	
inorganics*			X				X	X	X	X					

* *Inorganic formulation of arsenic and/or chromium*
** *See process residual for examples*
*** *Not necessarily limited to these wastes*
Note: The Toxicity Characteristic waste code apply only to those wastes that are not already covered by an F, or V waste code.

Exclusions from the Definition of Solid Waste

In order for a material to be considered a hazardous waste under RCRA, it must first be classified as a solid waste. Several types of materials, however, are expressly **excluded** from RCRA's definition of solid waste. Because they are not considered solid wastes, excluded wastes cannot be considered hazardous waste and are not subject to RCRA regulation. Excluded wastes may include wood preserving wastes that are recycled or reused in a manner consistent with normal product handling (e.g., directly returned to the treatment process). The eligibility of a particular material for an exclusion will depend upon the part of the process from which it is produced and the intended use of the material.

Note: *When evaluating the RCRA exclusions that may apply to the reuse of spent wood preserving solutions, it is important to note that wood preservative that is directly returned from the retort to storage and mixture tanks for reuse, is not considered a waste under RCRA. Any preservative that has not been absorbed by the wood may be directly pumped back into the system and reused without ever becoming subject to regulation. It is when the preservative is taken out of this continuous process loop, <u>either</u> for reclamation or disposal, that it becomes subject to regulation as a RCRA hazardous waste (e.g., when it is on the drip pad, which is a hazardous waste management unit and is not considered by EPA to be part of a closed loop). Owners/operators are strongly encouraged to verify the status of a particular waste stream with the appropriate State hazardous waste agency.*

Closed Loop Recycling

Closed loop recycling involves processes where secondary materials are reclaimed and returned to the original process from which they were generated, provided a number of conditions are met. This exclusion requires that **only tank storage be used**, and that the entire process, through completion of reclamation, be closed (e.g., there must be no potential for releases into the environment).

Wastes generated in the wood preserving industry will not usually qualify for the closed loop recycling exclusion. This is because a large portion of the waste generated during the treatment process is generated when excess preservative and process residuals accumulate on drip pads. EPA has determined that drippage and residuals that "escape" the wood preserving process (i.e., wastes that accumulate on drip pads) are not eligible for this exclusion because **drip pads are not considered tank storage**.

It is possible that other wastes generated during the wood preserving process (e.g., wastes that are not accumulated on drip pads) could qualify for this exclusion. For example, wastes from the treatment cylinder that are pumped back into the product holding tank, but that need some reclamation before being returned to the tank (e.g., filtration or separation) may meet this exclusion. This is an important exclusion to consider if excess preservative that is removed from the treatment cylinder following wood treatment must be reclaimed in any way before reinsertion back to the process tank. Normally, any spent material, such as preservative solution that cannot be used further without some reprocessing, and which is reclaimed, is considered a solid waste and a hazardous waste under RCRA until the point that it is reclaimed and can be used as a product again. Owners/operators who utilize the closed loop exemption will not have to classify these materials as hazardous waste, and will not have to "count" these wastes each month toward their generator status.

Direct Use/Reuse

RCRA also contains a specific exclusion from the definition of solid waste for materials that are recycled through **direct use or reuse**. This exclusion involves the return of a chemical to the original process from which it was generated as a substitute for a raw material feedstock. If the material is delivered to the process and does not require or undergo any reprocessing to make it suitable for reuse, it may fit this exclusion. In other words, the material must be able to be directly reinserted back into the process without any intermediate reclamation or accumulation. For wood preservers,reclamation can include simple filtration. This exclusion is different from the closed loop exemption in that there can be **no reclamation** of the material prior to reinsertion into the process and the exclusion does not require a closed system. Owners/operators are strongly encouraged to verify the status of a particular waste stream with the appropriate State agency.

Reclaimed Spent Wood Preserving Solutions

To encourage the sound recycling of reclaimed products, EPA has exempted the following materials from the definition of solid waste:

- Spent wood preservative solutions that have been reclaimed and are reused for their intended purpose
- Wastewaters from the wood preserving process that have been reclaimed and are reused to treat wood.

Under this exclusion, spent wood preserving solutions that have been reclaimed and are reused for their original intended purpose are not considered solid or hazardous wastes under RCRA. Thus, preservative

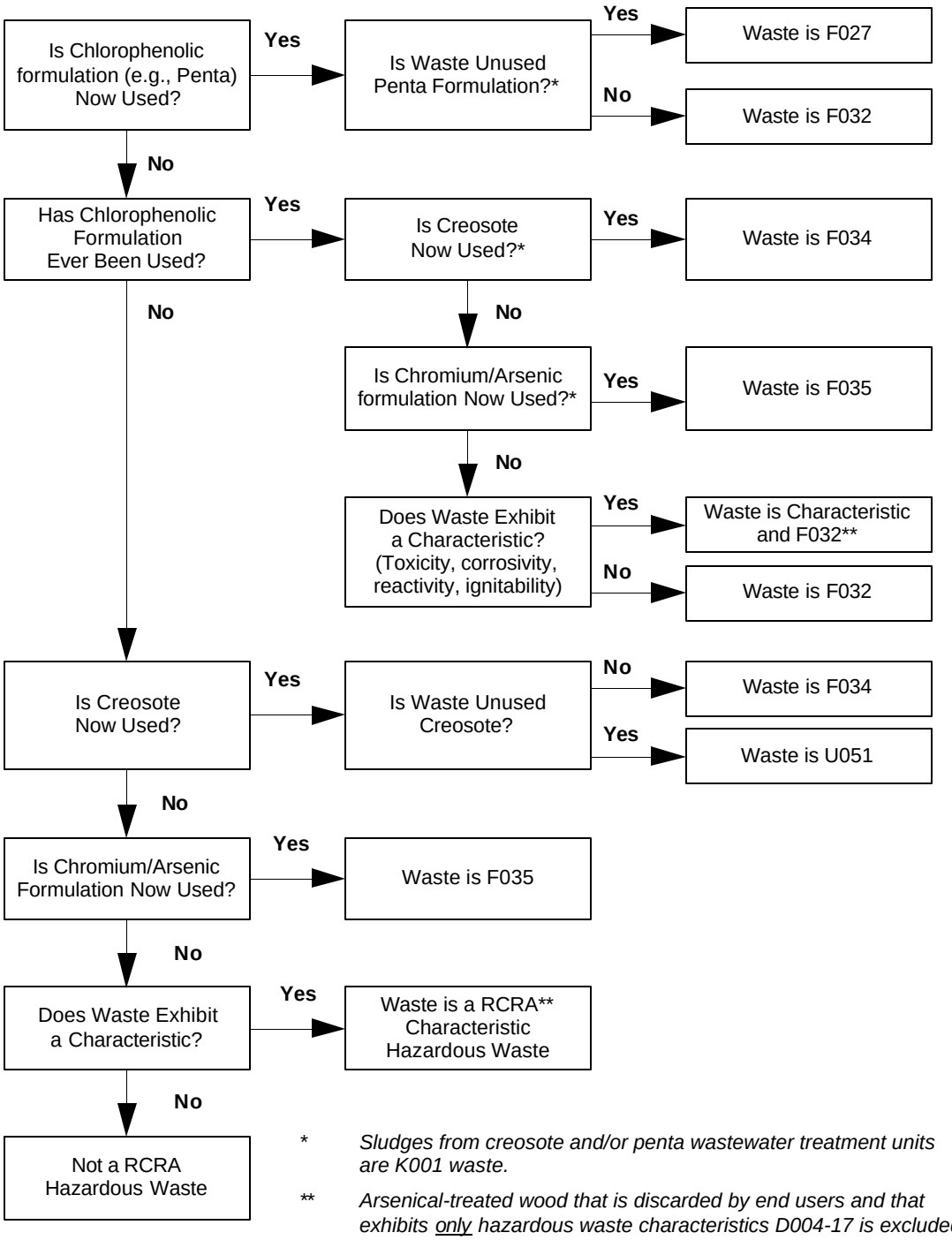
that is reclaimed and then pumped from the retort back into the holding tank for storage and reuse as a preservative is not regulated under RCRA. Similarly, wastewater from the wood preserving process that is "reclaimed" and reused to treat wood is also exempt from regulation.

Note: *This exclusion does not provide a blanket exclusion for these materials from their point of generation through reclamation. Up until the time the preservatives or wastewaters are reclaimed, the materials are considereds, and must be managed as, solid and hazardous wastes.*

The exclusions discussed above are very complex. Determining whether materials generated at a particular facility are, in fact, excluded from the definition of solid waste is dependent upon a number of site-specific variables. When determining whether one of these exclusions may apply to a specific waste stream, owners/operators may begin the assessment by using the following general rule of thumb. **Materials that do <u>not</u> come into contact with a hazardous waste drip pad, and that are directly reinserted back into the holding tank without being reclaimedfirst, are not considered hazardous wastes under RCRA, unless sent for disposal. Material that is collected on the drip pad and sent for disposal is a hazardous waste. Preservative solution that is collected on the drip pad and reclaimed before being used as a wood preservative is a solid and hazardous waste up until the point it is reclaimed.** Once reclaimed, these materials are no longer hazardous waste under RCRA.

Owners/operators should refer to their implementing hazardous waste agency for case-by-case analyses of difficult or questionable regulatory scenarios. Exhibit 12 is a decision tree for identification of hazardous waste that can be used by owners/operators to assist in making hazardous waste determinations.

Exhibit 12
Hazardous Waste Identification for the Wood Preserving Industry



* *Sludges from creosote and/or penta wastewater treatment units are K001 waste.*

** *Arsenical-treated wood that is discarded by end users and that exhibits <u>only</u> hazardous waste characteristics D004-17 is excluded from RCRA regulation*

Note: Possible F032 waste code deletion if equipment is cleaned according to procedures specified in §261.35. Also see: 57 Federal Register, December 24, 1992, p61493 - Provisional Elimination of F032 Waste Code

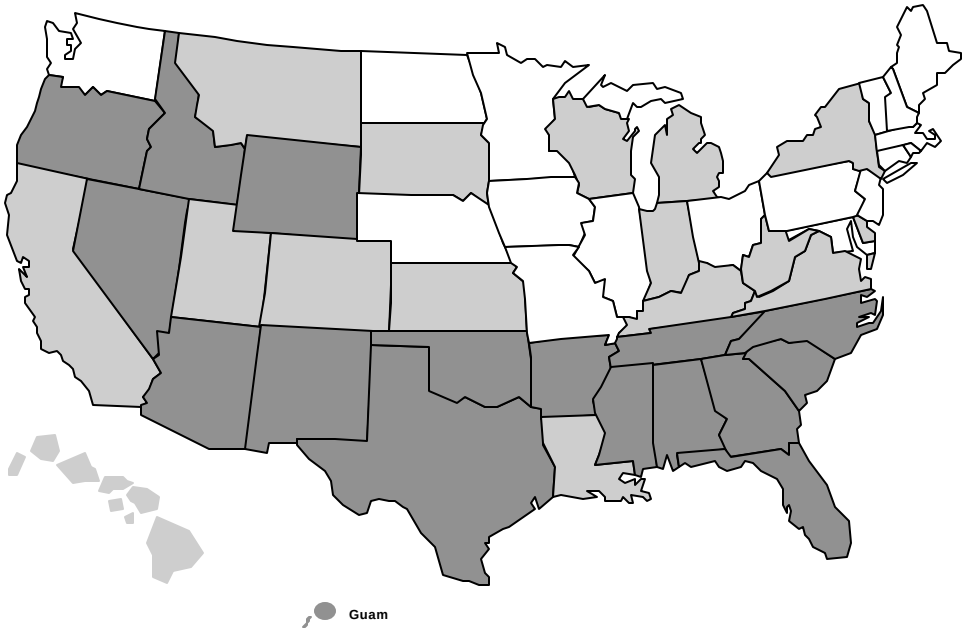
Wood Preserving State Authorization Issues

As discussed in Section 4, the status of a particular rulemaking in a State depends on the State's authorization status for that rule. If a rulemaking is promulgated pursuant to original RCRA (non-HSWA) language, the rule will not become effective in a "base" authorized State until that State adopts the rule. Rulemakings promulgated pursuant to HSWA of 1984, however, will be effective immediately in all States until each State adopts the rule. Until States are able to do so, EPA will implement the HSWA provisions. The wood preserving industry is a good example of how both HSWA and non-HSWA provisions can work in conjunction with one another. For example, certain portions of the final wood preserving rule (55 FR 50450; December 6, 1990) were promulgated under HSWA authority, while others were promulgated pursuant to non-HSWA authority. The implications of this are discussed below.

Hazardous waste codes F032, F034, and F035 were promulgated pursuant to different statutory authorities. The F032 listing is a HSWA provision, and is applicable in all States, regardless of whether they are "base" authorized or not. Since the F034 and F035 listings are non-HSWA provisions, these listings are only effective in those States that are not authorized for the "base" RCRA program, and in those States that have incorporated the listings into their State programs and received EPA approval for such revisions. On the other hand, the F034 and F035 listings are not applicable in base authorized States that have not yet modified their State programs to include these listings. In order to become authorized for these listings, a State must "pick up" the rulemaking which promulgated the listings. In this particular case, a State would need to become authorized for the December 6, 1990, Federal Register which is the final rulemakings for these listings. Exhibit 13 illustrates which States have "picked up" the wood preserving rule, and which have not.

Exhibit 13

State Authorization/Delegation of RCRA Wood Preserving Rules



Authorized for Wood Preserving Listing/Final Drip Pad Standards

Adopted the December 6, 1990, Federal Register, but not before obtaining final authorization for a particular rulemaking. Thus States must first adopt the regulations as part of that State's hazardous waste program. Once the State has adopted the standards, Federal authorization can be achieved.

Possibly authorized for other rules, but not for 12/6/90 Federal Register

Note: *The December 6, 1990 Federal Register is not the only source of information pertaining to wood preserving wastes and hazardous waste drip pads. it is, however, the most significant rulemaking concerning wood preserving and subpart W drip pads. Any State that is authorized for this rule is authorized for the majority of requirements. This map will give owners/operators a very good indication of which States are authorized for the rule. For information on other rulemakings pertaining to the wood preserving industry, please consult the appropriate State hazardous waste agency.*

Note: It is important to remember that wood preserving wastes may carry waste codes other than F032, F034, and F035. For example, a wood preserving waste could exhibit the toxicity characteristic for lead (D008). Exhibit 12 focuses on the wood preserving rule because it promulgates the listings most commonly generated at wood preserving facilities, as well as the drip pad standards themselves. Thus, a State that has been authorized for this rule is authorized for both the wood preserving listings and the Subpart W standards. To determine the status of this waste stream in a

particular State, an owner/operator must check to see if that State is, authorized for the rule which promulgated the toxicity characteristic (March 27, 1990, Federal Register. *The same type of determination must be made for other wastes generated at the facility.*

The authorization status of hazardous waste drip pads is directly tied to that of the wastes being accumulated on such drip pads. For example, EPA considers the drip pad standards to be HSWA requirements when used in conjunction with the F032 listing. Thus, the Subpart W provisions for F032 drip pads will be effective on the same date as the F032 listing, and will be administered by EPA until the State picks up the rule. For F034 and F035 drip pads, however, the Subpart W standards are not immediately effective in base authorized States since these requirements were not promulgated pursuant to HSWA authority. Therefore, the permitted and interim status standards for drip pads associated with F034 and F035 wastes will only become effective in base authorized States when F034 and F035 become hazardous wastes in those States, and when those States are authorized for the drip pad standards.

Note: *Many wastes generated on drip pads may also exhibit the toxicity characteristic (TC). The TC, promulgated pursuant to HSWA authority, is effective in all States and implemented by EPA until each State is able to adopt the rule and implement the program. As a result, drip pads used to manage TC wastes must meet the Subpart W standards. This is identical to the authorization scenario for F032 wastes.*

State authorization of wood preserving wastes and Subpart W drip pads is a particularly difficult issue, requiring an in-depth understanding of RCRA's State authorization program. To accurately assess the status of a waste stream in a particular State, owners/ operators must contact the appropriate State hazardous waste agency.

Pollution Prevention Opportunities

The best way to reduce pollution is to prevent it in the first place. Some companies have creatively implemented pollution prevention techniques that improve efficiency and increase profits while at the same time minimizing environmental impacts. This can be done in many ways such as reducing material inputs, re-engineering processes to reuse by-products, improving management practices, and employing substitution of toxic chemicals. Some smaller facilities are able to actually get below regulatory thresholds through aggressive pollution prevention policies.

In order to encourage these approaches, this section provides both general company-specific descriptions of some pollution prevention advances that have been implemented within the wood preserves industry. While the list is not exhaustive, it can be used as the starting point for facilities interested in beginning pollution prevention projects. The activities described in this section do not necessarily apply to all facilities. Facility-specific conditions must be carefully considered when pollution prevention options are evaluated, and facilities must examine how each option affects, air, land, and water pollutant releases.

Water-borne preservatives produce less waste than oil-borne preservatives because process wastewater is reused rather than discharged. In addition, well designed treatment plants, good treatment practices, effective housekeeping, and employee training also help reduce waste at the source.

Well designed treatment plants may have enclosed treatment buildings, covered drip pads with liners, automatic lumber handling systems, centralized tank farms with spill containment, and air ventilation systems. Facilities can reduce waste by using drip free trams and dedicated drip pad fork lifts that do not track debris into the drip pad. Some facility operators prevent significant spills from incomplete door seals by using a remote TV monitor to quickly discover and correct door leaks. Plants can also be designed to minimize mist or droplet emissions from cylinders and work tanks through the use of air exchange systems and cylinder and tank venting.

Treatment practices are also important for preventing pollution. Ensuring that wood stock is clean prior to treatment will prevent dirt, sawdust, and other debris from accumulating in the treatment system. To prevent debris buildup, wood can be covered during shipment and/or power-washed before it enters the treatment plant. Strip pumps may be installed to continuously return residual chemical solutions to the work tank, resulting in less dripping when the cylinder doors are opened. If treating cylinders are tilted slightly away from the drip pad, there is also less spillage when cylinder doors are opened.

CCA facility operators can reduce the amount of preservative that is washed off by rainwater in the storage yard by ensuring that chemical fixation has occured before a charge is moved off of the drip pad or out from under an enclosure.

Housekeeping is an integral part of waste minimization efforts. All tanks, mixing systems, treating cylinders, drip pads, and spill containments should

be inspected regularly for leaks. Drip pads and collection areas should be kept clean. Storage yards should be inspected daily, and any drippage should be cleaned up within 24 hours.

Several other preservatives have been proposed as alternatives to traditional preservatives. For example, wood can be treated with borates using both pressure and non-pressure processes. However, because they are highly susceptible to leaching, borates cannot be used to preserve wood that will be in contact with the ground or exposed to the weather (e.g., decking).

Ammoniacal copper/quarternary ammonium (ACQ) is another proposed alternative. Initial above-ground field test data show that ACQ is effective for softwood and hardwood protection. Other alternative preservatives may include copper-8-quinolinolate (Cu_8), copper naphthanate, zinc naphthanate, quarternary NH_4 compounds (QAC), and zinc sulfate.

Treatment processes may vary in their ability to minimize waste. For example, the empty-cell process uses less carrier oil than the full-cell process for oil-borne preservatives. The modified full-cell treatment reduces the uptake of treating solution and minimizes the amount of dripping from wood that has been treated with water-borne preservatives.

Pollution Prevention Case Study

Perry Builders, Inc. employs 20 people at its pressure wood preserving manufacturing facility. Perry Builders recognizes that each wood treater has an important responsibility in properly handling and disposing of the wastes it produces, and is committed to meeting this challenge. Perry uses a water-borne chemical preservative, chromated copper arsenate, to treat lumber, plywood, timbers, and other wood products for decks, fences, and other outdoor uses. Hazardous waste results when sawdust, wood chips, and dirt comes in contact with the preservative.

Perry has successfully minimized its hazardous waste generation by 80 percent in two years with the implementation of a low-cost waste minimization program. In 1987, Perry generated 15 drums of hazardous waste with a disposal cost of $2,380. By 1989 Perry reduced its disposal cost to $310 by generating only two drums.

This reduction was achieved by changing both equipment and processes to achieve a fully integrated closed system in which the application, receipt, transfer, and storage of the preservative takes place in a contained area.

The goal is to apply the preservative to the wood while minimizing the loss of the preservative as a waste. By holding the lumber in the treatment chamber longer to allow drippage, and by using a vacuum pump to further dry the lumber, the treatment solution remains in the chamber and does not come into contact with scrap material and dirt. A roof over the area housing the treated lumber prevents runoff during rainfall. As an incentive to ensure adequate drying time, employ pay is based on hourly wages rather than the amount of lumber treated.

Perry Builders estimates that the cost of the vacuum pump, the roof, and the increased drying time will be recovered in five years through reduced disposal costs. There is also another economic benefit — since the drier lumber weighs less, more footage of lumber can be shipped on each truck, reducing freight costs.

Frequently Asked Questions

The following are frequently asked questions concerning regulatory scenarios encountered at wood preserving facilities. In every case, it is imperative that owners/operators consult the appropriate RCRA-delegated agency for final regulatory determinations. Responses to these questions assume that the facility uses creosote, pentachlorophenol, or inorganic arsenic or chromium, and that it has the potential to generate RCRA hazardous wastes.

Question 1 Counting Hazardous Waste

- **At what point is drippage that is returned to the treatment chamber from the drip pad no longer considered a solid and hazardous waste?**

  Assuming the drippage is sent for recycling before reinsertion, once drippage passes through the final filter into a holding or process tank (not a waste sump), the solution is no longer considered a hazardous waste provided it is to be used for its originally intended purpose (i.e., to treat wood). However, the quantity of waste that was returned to the process must be "counted" at least once as waste that was generated at the facility, and must be applied toward determining generator status.

Question 2 Rainfall

- **Is it acceptable to use meteorological data (e.g., rainfall per year) to calculate the contribution of rainfall accumulating on a drip pad toward a facility's generation of hazardous waste?**

  Precipitation hitting a Subpart W drip pad is considered hazardous waste. Using meteorological data to calculate the contribution of rainfall to wastewater is acceptable, provided the facility uses the

appropriate equipment (e.g., a rain gauge) and is able to demonstrate to inspectors how the calculation was performed.

Question 3
Kiln Wastewater

- **Does EPA consider wastewater condensate generated from kiln drying treated wood hazardous waste under RCRA?**

Yes, any drippage, condensate, or wastewater generated as a result of kiln drying after the treatment of wood meets the definition of a listed waste under RCRA (57 FR 61498; December 24, 1992). The specific listing (i.e., F032, F034, or F035) will depend upon the chemical formulation being used at the facility (the material could also exhibit a characteristic of hazardous waste). It is important to note, however, that steam or condensate which does not come into contact with treated wood or preservative (i.e., condensate from steam coils) does not meet the definition of a listed hazardous waste.

Question 4
Liquid Separation of Wastes

- **A large quantity generator employing water-borne processes is air drying residual wood preserving solution prior to the disposal of wood chips. Is this considered "treatment" under RCRA, and thus subject to permitting under 40 CFR Part 270?**

Air drying is considered a form of treatment under RCRA. According to Federal regulations, however, generators may treat waste in accumulation units as long as they continue to comply with all appropriate management standards described in 40 CFR §262.34 (i.e., the chips are accumulated in tanks or containers that meet the technical standards for such units in part 265 of the RCRA regulations). As a result, no permit is required for air drying activities unless the generator accumulates the waste on site for longer than the allowable 90-day period provided to large quantity generators (180 days for small quantity generators).

In addition, if the intent of the air drying process is liquid or preservative recovery, this treatment is considered reclamation, and is exempt from permitting under 40 CFR §261.6(c). Any materials generated as a result of this drying (e.g., the wood chips that are sent for disposal) are still considered a listed hazardous waste (via the derived-from rule) and must be handled according to RCRA regulations regardless of whether the drying was for treatment or for reclamation. An exception is if the reclaimed liquids are to be used again for wood treatment, in which case it is no longer be considered a hazardous waste once reclamation is complete.

Process residuals can be placed on screens or racks over the sump or drip pad to allow separation of liquid from solids. Liquid separation of residuals and sludge must be performed in a closed, labeled, mesh box in a well-ventilated area. Special precautions should be taken against the release of process residual dust once the material has dried.

Question 5 Switching Formulations to Nonhazardous Generating Preservatives

- **Does a wood treater (large quantity generator) who switches to a chemical that does not generate any RCRA hazardous waste need to close the facility's drip pad before switching processes?**

Yes, the drip pad must be closed pursuant to applicable regulations if the wood treater wishes to stop managing the drip pad as a hazardous waste management unit (i.e., complying with Subpart W standards). Closure of a drip pad is not required just because the facility switches chemicals. However, if an owner or operator changes chemicals without first performing clean closure according to the RCRA drip pad closure requirements, the drip pad must continue to be operated as a Subpart W drip pad and all wastewater, preservative drippage, and process residuals subsequently managed on the drip pad must continue to be treated as hazardous waste.

To operate the drip pad as a non-hazardous waste management unit (i.e., non-Subpart W drip pad), the large quantity generator must follow the general closure standards set forth in 40 CFR §265.111 and §265.114. This self-implementing performance standard allows for the full decontamination of equipment, structures, and soils. If decontamination cannot be accomplished, the drip pad must satisfy full closure requirements under RCRA for landfills. Finally, the decontamination process should be fully documented. Generators must also follow the §262.34 accumulation time provisions to accommodate the safe disposal of any hazardous wastes generated during closure activities.

Question 6 Discarded Treated Wood

- **The F032, F034, and F035 hazardous waste listings apply to spent formulations from wood processing generated at plants using pentachlorophenol, creosote, or chromated copper arsenate. Are scrap pieces of wood treated with these preservatives considered wastes when discarded?**

Wood stickers, slabs, splinters, sawdust, or bark that are generated as a result of the treatment process (i.e., particles that fall off of

wood into the cylinder, door pit, or drip pad during the treatment process) are considered process residuals and thus listed hazardous wastes under RCRA. These types of wastes are the direct result of the treatment process and are considered part of the facility's waste generation. Pieces that are cut off of finished products, however, or that result from damage to the finished product after it has been removed from the drip pad, are not considered listed hazardous waste. However, waste scraps of wood may still exhibit a characteristic of hazardous waste and thus be subject to regulation under Subtitle C of RCRA.

Note: *Discarded wood products that fail the toxicity characteristic for D004-D017 are not hazardous wastes due to an existing exclusion under RCRA for arsenical-treated wood in §261.4(b)(9).*

The post-consumer disposal of wood products that have been treated with chemicals normally considered to be hazardous waste (when generated at wood preserving facilities), are not considered listed wastes under RCRA. For example, creosote treated railroad ties are not listed hazardous wastes when disposed; however, they may exhibit a characteristic of hazardous waste, in which case they must be managed as hazardous waste.

Question 7
Retroactivity of Waste Listings

- **During remediation activities at a wood preserving facility, soil is excavated and sent for disposal. Because of limited records concerning past operations, the facility is having difficulty determining the applicability of hazardous waste listings. How is this type of waste usually characterized?**

Wastes released prior to the development of the wood preserving listings in 1990 that meet the listing description are not hazardous wastes unless/until they are "actively managed." **Active management** has been defined by EPA to comprise the physical disturbance of accumulated hazardous waste (57 FR 37284; August 18, 1992). The excavation of contaminated soils is one example of an activity that EPA considers to be active management. Once a waste is actively managed, **hazardous waste listings retroactively apply** (i.e., waste that is actively managed will be tested against the current listing description regardless of when it was disposed).

In determining whether the material in the soil meets a hazardous waste listing, an owner/operator must gather enough evidence of

processes employed at the facility (both present and past) to reach an accurate hazardous waste determination. EPA recognizes that soil may contain preservative constituents due to rainwater wash-off which does not meet the listing description (i.e., wash-off from a storage yard does not meet a listing but still contains the same constituents as a listed hazardous waste). Therefore, soils may contain constituents and not meet the listing definition, but instead may exhibit a characteristic of hazardous waste.

EPA has made a clear distinction between drippage and rainwater wash-off:

"...The term 'drippage' refers to excess preservative that is kicked back from the wood following treatment. It does not apply to precipitation that drips from a stack of wood in the storage yard when it falls from wood that has ceased to drip on the process area drip pad before being moved to the storage yard (55 FR 50452; December 6, 1990)."

Question 8
Underground Storage Tanks

- **A wood treatment plant stores copper sulfate in underground storage tanks for use in a preservative process. Do the requirements of 40 CFR Part 280 concerning underground storage apply to these product tanks?**

Yes, these types of tanks would be regulated under 40 CFR Part 280.

Question 9
***De minimis* Wastes**

- **What constitutes *"de minimis"* drippage for purposes of Subpart W compliance?**

The term "*de minimis*" is not used by EPA in conjunction with wood preserving wastes or the Subpart W drip pad standards. *De minimis* drippage refers to an exempt volume of drippage, and no volume of drippage of hazardous waste is exempt in the wood preserving industry. Instead, EPA refers to drippage from kickback in the storage yard as "infrequent and incidental drippage." Kickback refers to wood preservative that is generated from treated wood as the wood begins to return to normal pressure after a pressure treating process.

Facilities must clean up kickback within 24 hours of the drippage hitting the ground in accordance with a facility contingency plan. If the release coincides with a holiday or weekend, the incidental drippage must be cleaned up within 72 hours.

Question 10
Surface Protection versus Wood Treatment

- **What is the difference between surface protection and wood treatment?**

If the purpose of the operation is to temporarily protect wood against sap stains or other discoloration that may form on the surface of the wood after cutting, it is considered by EPA to be a wood surface protection process. Wastes from surface protection operations are currently not regulated as listed hazardous wastes by EPA. Wood preserving, on the other hand, involves the application of chemicals to provide long-term protection against structural problems in wood as a result of ground contact, weathering, or insect damage.

Additional information is available on the subjects discussed above:

- For general information on RCRA, refer to EPA's RCRA Orientation Manual, 1990 Edition, EPA/530-SW-90-036.
- For information on the specific regulations, consult the following sections of the Code of Federal Regulations:
  - Hazardous Waste Under RCRA — 40 CFR Part 261
  - Definition of Solid Waste/Recycling Exemptions — 40 CFR 261.2
  - Equipment Cleaning Procedures — 40 CFR 261.35
  - Closed Loop Recycling — 40 CFR 261.4(a)(8)
  - Direct Use/Reuse — 40 CFR 261.2
  - Solid/Hazardous Waste Exclusions — 40 CFR 261.(4)(a)(8), (b)(9).
- For more information on hazardous waste counting, consult the May 11, 1995, Federal Register (60 FR 25510).
- For more information on EPA's decision not to regulate wood surface protection wastes, please consult the January 4, 1994, Federal Register (59 FR 458).

SECTION 5
DRIP PADS

Introduction

Subpart W drip pads are hazardous waste management units that are unique to the wood preserving industry. Drip pads are used to accumulate and manage excess wood preserving formulations following the treatment of virgin timber. In many cases, excess formulation dripping from the treated wood is considered hazardous waste under RCRA.

EPA has issued specific regulations listing wood preserving process wastes as hazardous. These hazardous wastes include wastewaters, process residuals, preservative drippage, and spent formulations from wood preserving operations using chlorophenolic formulations (F032), creosote formulations (F034), and inorganic preservatives containing arsenic or chromium (F035) (see Section 4 for a discussion of wastes generated in the wood preserving industry).

Due to the nature of wood preserving wastes and the manner in which they are generated (i.e., over a very large surface area), EPA discovered that the regulations governing traditional RCRA hazardous waste management units were not particularly useful. To accommodate this uniqueness and to ensure proper and consistent waste management, in 1990 EPA developed specific standards for the design, installation, operation, and closure of hazardous waste drip pads by recognizing drip pads as a new type of hazardous waste management unit under RCRA. This section of the Compliance Guide discusses these standards, which are referred to as **RCRA Subpart W** standards.

Note: *Owners/operators of wood preserving facilities can use tanks or containers instead of drip pads to accumulate hazardous wastes that are generated in the wood preserving industry, but no drippage may occur outside the tank. Due to the unique manner in which wood preserving wastes are generated (e.g., over a very large surface area), use of a drip pad is often the most feasible way to contain and accumulate hazardous waste that is generated from the treated wood. Use of tank storage may be feasible at facilities using dip tanks instead of pressure treatment. Also, tanks and containers can, and often are, used elsewhere at wood preserving facilities to accumulate other types of hazardous waste generated at other locations on site.*

Regardless of the management practice used at a particular facility, drippage that meets a listing description or exhibits a characteristic of hazardous waste that is allowed to fall onto the ground or onto a non-regulated unit (e.g., a non-regulated drip pad) is considered illegal disposal of a hazardous waste, and may be subject to enforcement action. Incidental drippage in storage yards from charges of wood that remained on drip pads until all drippage ceased is not considered a listed hazardous waste. However, owners/ operators must maintain contingency plans for cleanup of this type of drippage.

New vs. Existing Drip Pads

Distinctions are made between new and existing drip pads. A drip pad is considered **existing** if construction was completed prior to December 6, 1990. All other drip pads are considered **new**. A "**new prime**" drip pad is one that contains both a leak detection and leak collection system as specified in the regulations. Owners/operators of new drip pads must comply with all of the standards discussed below. Existing drip pads may need to be modified or "upgraded" to ensure adequate protection of human health and the environment. EPA's regulation of existing drip pads is also discussed below.

Drip Pad Design Standards

EPA has established specific drip pad design standards to ensure that drip pads have sufficient structural strength to prevent failure of the drip pad under the weight of wood and equipment. To accomplish this, all drip pads must:

- Be constructed of non-earthen materials (this excludes wood and non-structurally supported asphalt); drip pads are typically constructed of concrete or steel
- Be sloped to ensure that drippage, wastewater, and other liquids flow to a collection system and do not "puddle" on the drip pad surface
- Have a curb or berm around the perimeter to prevent run-on and run-off
- Be strong enough to stand up to daily operational activities, fork lifts, traffic, and remain structurally sound and crack-free.

One of the main goals of the drip pad design standards is to prevent the flow of waste from the drip pad to the surrounding environment. Subpart W requires owners/operators to protect against the migration of hazardous wastes and their constituents into the environment. An owner/operator has two design options.

The first option is to apply a **sealant** or **coating** to the drip pad surface to prevent hazardous wastes generated on the drip pad from seeping through the drip pad and into the surrounding environment. Sealants penetrate the surface of concrete drip pads and solidify to form an impermeable surface. Coatings do not penetrate the surface of the drip pad, but rather bond to the surface.

Because concrete, the most common construction material for drip pads, is inherently porous, Subpart W dictates the following performance standard for any sealant or coating:

- Once a sealant or coating is applied to an uncracked drip pad, the drip pad must meet the **hydraulic conductivity permeability rating of 1 x 10^{-7} cm/sec (for more information see Appendix B for contacts).**

In general, sealants tend to hold up better than coatings under the stresses of vehicle traffic, but tend to crack easily in conjunction with cracking concrete underneath. Coatings do not bond as well to the concrete, but tend to flex and protect the drip pad against micro-cracks.

Although the regulations were established under the assumption that concrete would be used to construct the drip pad, other materials, such as steel, are acceptable provided the hydraulic conductivity permeability rating of 1 x 10^{-7} cm/sec is achieved. Because uncracked steel meets this rating by itself, a sealer or coating is not necessary to satisfy RCRA requirements.

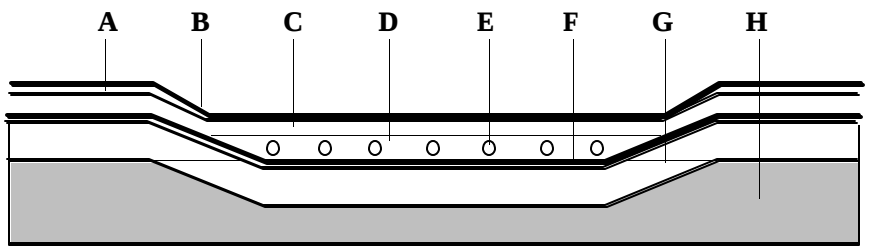
The second option is to install a synthetic liner and leak detection system/leak collection system below the drip pad to prevent leakage into the adjacent subsurface soil, groundwater, or surface water.

Owners/operators of both new and existing drip pads must employ at least one of these methods to comply with the Subpart W standards (drip pads that were constructed between December 6, 1990, and December 24, 1992 do not have to install a leak collection system with their leak detection system). EPA does not recommend one option over the other, but believes that installation of a liner and leak detection system will require less maintenance and be less costly than repeated application of surface coatings or sealants. Each of the design options for drip pads is discussed in more detail below.

Exhibits 14 and 15 provide a side and front view of a typical drip pad.

Exhibit 14

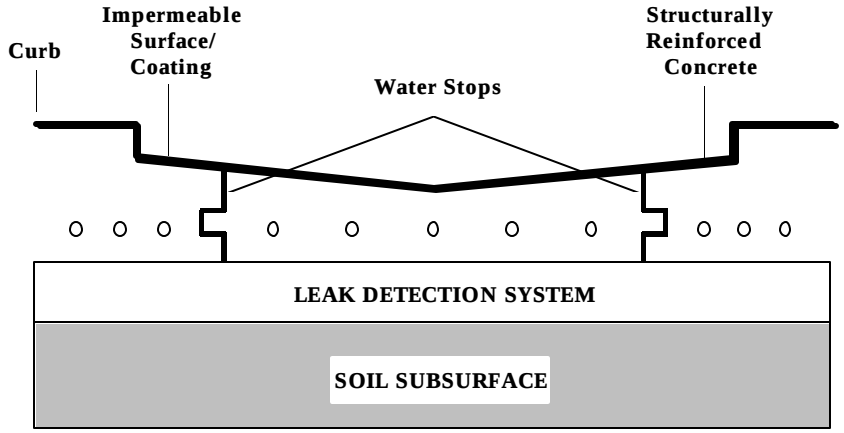
Side View of Typical Drip Pad



A Curb or Berm
B Sealer / Coating
C Reinforced Concrete Pad: Design will be Determined by Wheel Load
D Drainfield of Graded Fill
E Perforated or Slotted Pipe Leading to Sump for Leak Detection System
F Synthetic Liner
G Base to Support Liner
H Existing Soil Substrate

Exhibit 15

Front View of Typical Drip Pad



Sealed Drip Pads

Owners/operators electing to apply a coating or sealant to a drip pad must cover the entire surface of the drip pad. The material used to seal the drip pad must be compatible with the wood preservatives used by the facility and must meet the hydraulic conductivity requirement of 1×10^{-7} cm/sec specified in the regulations. Additional factors that should be considered to ensure that the coating selected will achieve its standard for a particular use:

- Chemical resistivity
- Physical compatibility with service
- Adhesion capacity to substrate
- Temperature resistance
- Flexibility
- Scrubability
- Resistance to abrasion and impact
- Toxicity
- Drying and curing time
- Method and ease of application.

In addition to selecting a compatible sealant or coating, proper application of the product is crucial in meeting the drip pad design standards. Proper installation not only ensures that the hydraulic conductivity standard will be achieved, but may also prolong the effectiveness of a particular coating, reducing the necessity and frequency of reapplication. Coatings and sealers should be chosen based on the service they will see on the drip pad. For example, forklifts operating on a common area have been known to tear coatings, while sealers have been found to better withstand this type of pressure.

Drip Pad Liners

Owners/operators who choose to install a liner and leak detection system must also follow certain design criteria. Specifically, each liner must:

- Prevent leakage during the active life of the drip pad
- Resist absorption of waste
- Be constructed of material that is strong and thick enough to prevent failure of the system
- Be placed on a foundation or base which can support the liner
- Cover all surfaces that could come in contact with waste or leakage.

During construction or installation, each liner must be inspected for structural defects. After construction, a registered, independent, professional engineer must certify that the pad meets all requirements set

forth in the Subpart W regulations. This certification must be kept in the facility's operating log.

Leak Detection Systems

There are several specifications for the drip pad leak detection systems that are used in conjunction with the synthetic liner. Leak detection systems must be:

- Located immediately above the liner
- Constructed of materials which can chemically resist waste and physically resist pressure from above
- Designed to detect drip pad failure or the release of hazardous waste or accumulated liquid at the earliest practicable time
- Designed and operated to function without clogging.

Liquid Collection Systems

Owners/operators of Subpart W drip pads installed after December 24, 1992 choosing to comply with the synthetic liner option must also equip the drip pads with a leak collection system to remove waste accumulating on the liner. If this collection system involves the use of a tank or sump to collect any excess liquids, the tank or sump will be subject to the management standards applicable to hazardous waste tanks under RCRA Subpart J.

Tanks and sumps that are part of wastewater treatment units may be exempt from RCRA regulation if they are otherwise subject to regulation under the Clean Water Act (CWA). A discussion of Subpart J is provided in Section 7.

Drip pad leak collection systems must be:

- Located immediately above the liner
- Designed, constructed, maintained, and operated so that leakage can be removed from below the drip pad
- Designed and operated to convey, drain, and collect liquid in a way that prevents run-off
- Emptied as necessary to ensure that the capacity of the system is maintained.

Note: *Leakage collection systems must be a collection device separate from the sump or tank system used to collect liquid flowing off of the drip pad.*

Run-on and Run-off Control

Drip pads that are not inside or otherwise covered must be equipped with **run-on and run-off control systems** able to collect and control the volume of rainwater from a 24-hour, 25-year storm. This system must be designed and operated to stop the flow of water both onto and off of the drip pad. In addition, any collection units associated with such systems must be emptied as soon as possible after storms to maintain the system's design capacity.

Note: *Regardless of whether a pad is covered, a curb or berm around the perimeter of the drip pad is required.*

Drip Pad Operation

There are several requirements concerning the operation of drip pads.

- The entire surface of the drip pad must be cleaned to allow for weekly inspection. The frequency and method of cleaning must be documented in the operating log (residues from drip pad cleaning are hazardous waste and must be managed accordingly).
- Drip pads must be maintained free of cracks that would otherwise adversely affect hydraulic conductivity, corrosion, or deterioration that could result in leakage.
- The drip pad must be operated in a way that minimizes the tracking of hazardous waste off of the drip pad by personnel and equipment. This may be accomplished by controlling employee access and having a dedicated forklift on the drip pad.
- After treatment, wood must remain on the drip pad until all drippage has ceased. The operating log must document that each charge has stopped dripping before it is removed from the pad.
- Collection systems and holding units for run-on and run-off control must be emptied as soon as possible after storms.

Temporary Accumulation of Hazardous Waste on Drip Pads

As discussed in Section 3 of this Guide, generators may use drip pads as hazardous waste accumulation units to temporarily store hazardous waste. A generator who accumulates hazardous waste on a drip pad for 90 days or less is not required to obtain a RCRA storage permit as long as:

- The drip pad satisfies technical standards set out in the regulations
- The facility has written procedures to ensure that wastes are removed from the pad and collection system at least every 90 days
- Records are kept documenting that these procedures are followed, the date and time of removal, and the quantity removed.

This 90-day limit applies to both large quantity and small quantity generators. While **small quantity generators** may normally accumulate hazardous waste in accumulation units for up to 180 days, this is not the case for small quantity generators accumulating waste on Subpart W drip pads. Owners/operators of wood preserving facilities who generate between 100-1000 kg of hazardous waste per calendar month and who accumulate the waste on drip pads are not eligible for the reduced standards normally provided for small quantity generators. Instead, these generators must comply with all the management requirements for large quantity generators accumulating hazardous waste on drip pads.

Note: *Hazardous waste that is generated elsewhere at the wood preserving facility and accumulated in tanks or containers (i.e., not accumulated on drip pads) will remain subject to small quantity generator standards. Only waste that is accumulated on drip pads must adhere to the large quantity generator standards.*

Conditionally exempt small quantity generators are not subject to the 90-day accumulation limit, nor are they required to accumulate their hazardous wastes in any particular type of unit, including drip pads. Allowing hazardous waste to fall onto the ground is viewed as **illegal disposal**, and may result in an enforcement action if inspectors determine that such disposal threatens human health or the environment. As such, it is prudent for all wood preserving facilities, even if conditionally exempt, to ensure that they are operating their drip pads in an environmentally safe and responsible manner.

Assessment of Drip Pad Integrity

Many wood preserving facilities were already in existence when the drip pad standards were first issued. In fact, many facilities had been in operation for a number of years prior to development of the standards, and had been using drip pads to collect drippage from treated wood. In light of the potential cost to the existing facilities to upgrade every drip pad, EPA developed a certification program that allows owners/operators to assess and certify the integrity of existing drip pads until all repairs or upgrades have been made. **By upgrade, EPA means the installation of a leak detection and leak collection system, not the application of a sealant or coating.** Although owners/operators may still select which compliance option to implement, only a drip pad that has a leak detection/leak collection system will be considered "upgraded" for purposes of these standards.

Existing Drip Pads

Until a drip pad has been upgraded to include a liner and leak detection/leak collection system, owners/operators must evaluate each **existing drip pad** to determine the extent to which it meets all Subpart W design and operating requirements. A written assessment of the drip pad, attesting to the results of the evaluation, must be certified by an independent, qualified, registered professional engineer and kept on file at the facility. This assessment must be renewed, updated, and recertified annually until all upgrades have been made.

Although owners/operators may choose to apply a sealant and not install a liner in order to comply with applicable requirements, only those who install a liner and leak detection/leak collection system are relieved of the responsibility to conduct an annual assessment of the drip pad's integrity. Even if a facility installs a new drip pad and chooses to apply a coating or sealant instead of a liner system, the Subpart W standards still require an annual drip pad assessment. Thus, when determining which upgrade option is most suitable to a particular facility, owners/operators should compare the cost of performing annual assessments to the cost of installing a liner system.

Note: *Existing drip pads constructed between December 6, 1990, and December 24, 1992, that are being upgraded only require the installation of a leak detection system, and not a leak collection system as well. Any drip pad constructed after December 24, 1992, must include both a leak detection and leak collection system to be considered "upgraded" for purposes of Subpart W. EPA does recommend installation of both to ensure protection of human health and the environment. See Exhibit 16 for design and certification requirements.*

Although there is no specified date by which all facilities operating Subpart W drip pads must demonstrate that existing drip pads meet upgrade requirements, EPA feels that most facilities will choose to upgrade their drip pads with a liner and leak detection/leak collection system in light of long-term cost savings to the facility. Once a facility has upgraded its drip pads to comply with the leak detection/leak collection system and has obtained proper certification, no further annual assessment is required.

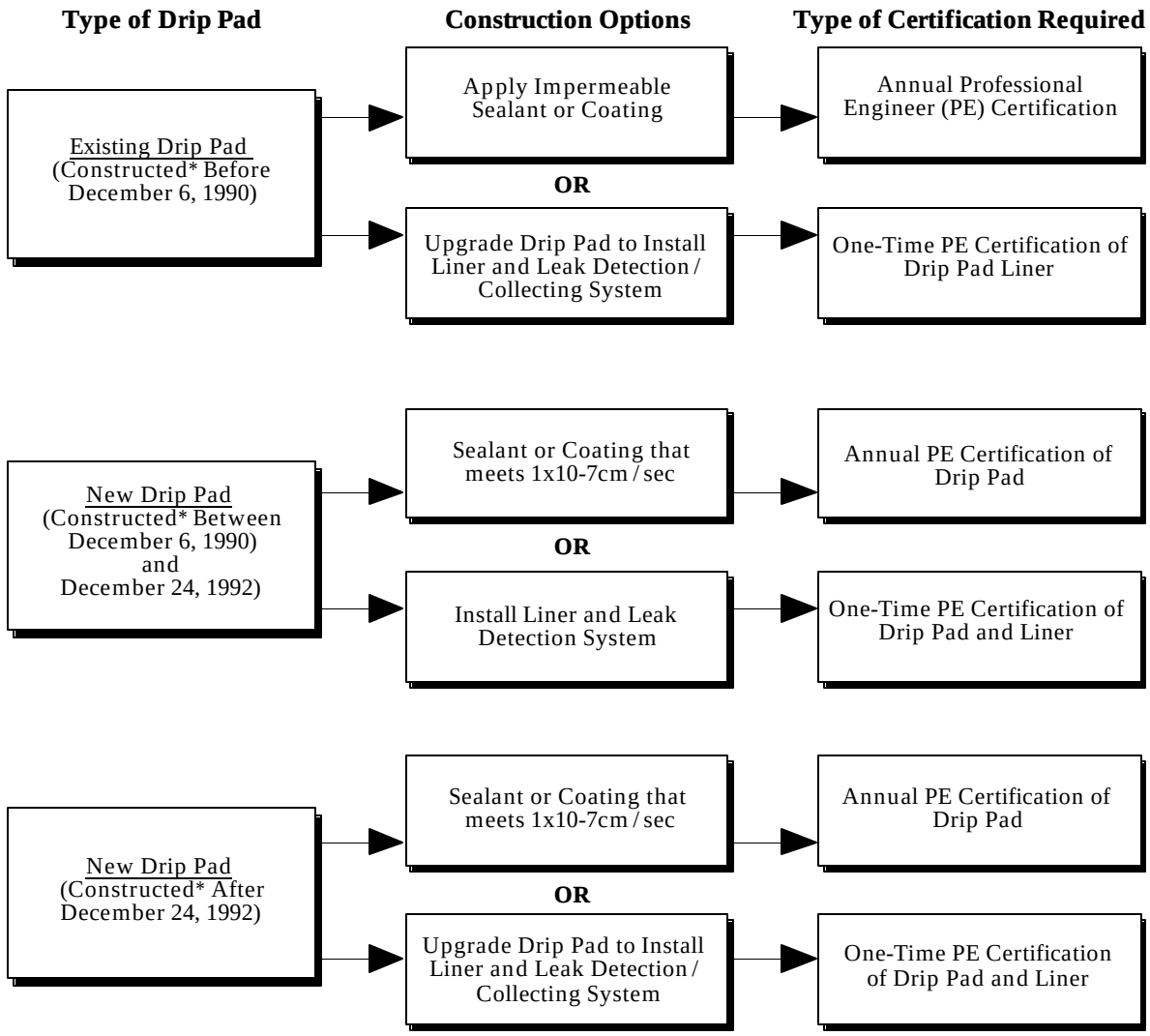
New Drip Pads

New drip pads must be assessed upon initial construction. During construction or installation, all liners and cover systems must be evaluated for uniformity, damage, and imperfections (e.g., holes, cracks, spots) that could potentially affect the drip pad's ability to protect against preservative leakage to the surrounding environment. Once construction is complete,

the drip pad must be inspected by an independent, qualified, registered professional engineer to ensure that it meets all applicable design requirements. All certifications must be kept as part of the facility's operating log. Unlike existing drip pads that have not yet been fully upgraded, there are no annual recertification requirements for new drip pads that have been constructed with a liner and leak detection/leak collection system. Exhibit 16 contains a summary of the drip pad construction and certification requirements.

Note: *EPA strongly encourages the use of both a liner system and application of a coating or sealant to the drip pad to ensure safe hazardous waste management. This will help to prevent present and future threats to human health and the environment posed by accidents, leaks, or general wear and tear.*

Exhibit 16
Drip Pad Construction and Certification Requirements

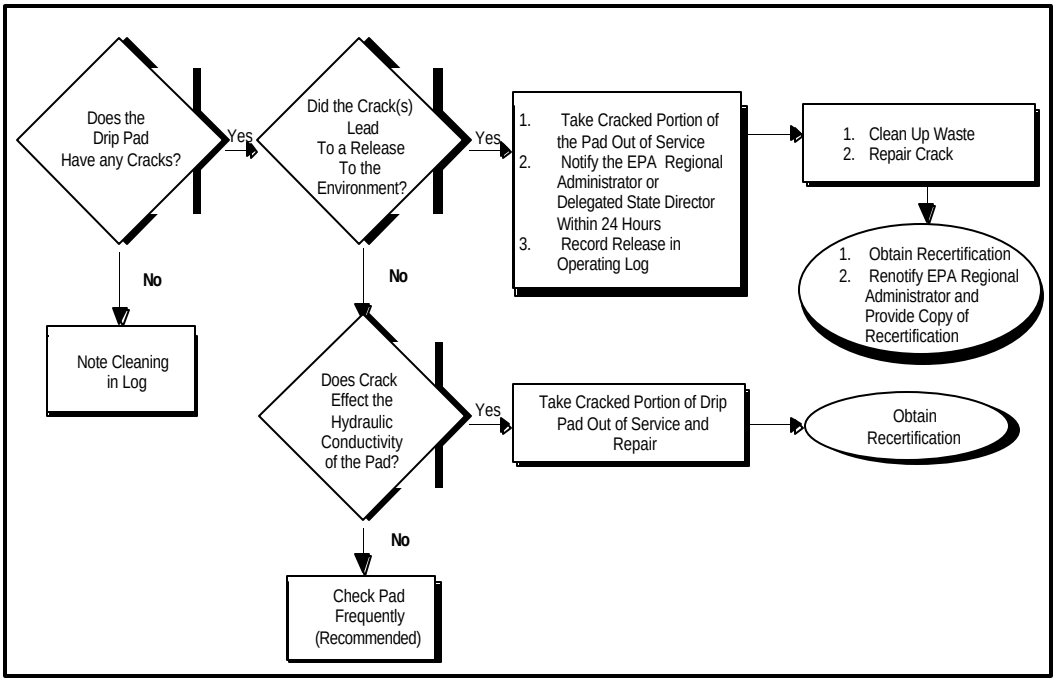


* "Under Construction" includes those drip pads for which an owner / operator signed or entered into a binding financial agreement for construction prior to this date.

Inspections

Drip pads must be inspected weekly and after storm events. The inspection must include checks for deterioration of the run-on and run-off control systems, the presence of leakage, proper functioning of the leak detection system, and deterioration of the drip pad surface. Records of drip pad inspections should be maintained at the facility for at least three years from the date of inspection. Exhibit 17 contains information concerning a facility's obligations with respect to drip pad inspection and maintenance.

Exhibit 17
Responding to Drip Pad Cracks



Operating Log

A drip pad owner/operator must comply with several recordkeeping requirements. Facilities are required to keep an operating log to document many of their activities with respect to drip pad maintenance and the management of hazardous waste. It is advisable to keep **all** information related to hazardous waste management activities in the operating log.

The following operations and activities must be documented in the facility's operating log:

- **Leakage/drippage —** date, time, and quantity of leakage collected and removed from leakage collection system, drip pad, and sump

- **Drip Pad Cleaning —** date and time of each drip pad and all cleaning procedures

- **Drip Pad Operation** — documentation that all treated wood is held on the pad until drippage has ceased

- **Inspections** — documentation of all inspections conducted in accordance with the requirements of Subpart W. To inspect a drip pad, owners/ operators must look for deterioration, malfunctions or improper operation of run-on and run-off control systems, proper operation of leak detection systems and leakage from these systems, and deterioration or cracking of the drip pad's surface.

- **Waste Handling** — documentation of facility waste handling practices, including preservative formulations used in the past, drippage management practices, and treated wood storage and handling practices. The log must describe the operation that will be followed to ensure that all wastes are removed from the drip pad and collection system at least once every 90 days.

Releases of Hazardous Waste from Drip Pads

There are several steps a facility must take in the event of a release of hazardous waste from a drip pad. Upon discovery of a release, owners/operators must:

- Discontinue operations on the affected portion of the drip pad
- Record the leak in the facility operating log, noting the date and time
- Determine what repairs are required, remove leakage from below the pad, and establish a schedule for cleanup and repair
- Notify the EPA Regional Administrator or delegated State director within 24 hours of discovery, and provide a written description of the planned cleanup and repair within 10 days
- Promptly perform repairs
- Following completion of repairs, notify the EPA Regional Administrator in writing that the cleanup and repairs were completed in accordance with the previously submitted plan. This notification must be certified by a registered, professional engineer.

Note: *It is not EPA's intent to require owners/operators to notify the EPA Regional Administrator for every repair made to a Subpart W drip pad. The owner/operator must notify the EPA Regional Administrator or State director only when there has been an* ***actual release*** *of hazardous waste from the drip pad. Cracks and other conditions that have the potential to lead to a release in the future need not be reported. Owners/operators must still make all appropriate repairs in a timely fashion and note the repairs in the facility log.*

Contingency Plans

Each facility must develop a contingency plan that describes the steps an owner/operator will take in response to a leak of hazardous waste from drip pads. Large quantity generators are required by regulation to develop such plans and amend them whenever necessary. A copy of the contingency plan must be maintained at the facility and submitted to all local police departments, fire departments, hospitals, and State and local emergency response teams. Contingency plans must contain the following information:

- General information about the facility
- The name, address, and phone number of the emergency coordinator and an alternate emergency coordinator
- Emergency procedures to be followed in the event of a spill, fire, or explosion
- The evacuation plan and a list of all emergency equipment at the facility.

Small quantity generators are also required to have contingency plans. These plans may be less detailed than those required for large quantity generators. However, because they are held to the same standards as large quantity generators when accumulating hazardous waste on drip pads, small quantity generators are required to develop full contingency plans identical to those required of large quantity generators. Conditionally exempt small quantity generators are not required to maintain contingency plans under RCRA, but are encouraged to do so.

Note: *This facility contingency plan is different from the storage yard clean-up plan that is also required under the drip pad standards.*

Closure of Drip Pads

To ensure that drip pads are properly managed when operations have ceased, all drip pads must be "closed" in a way that prevents future migration of contaminants into the environment. Closure of a drip pad involves removal or decontamination of all waste residue, contaminated soils, and equipment. If it is impossible or impractical to remove all contaminated soil, the unit must be treated and closed in a manner similar to a hazardous waste landfill. Generators accumulating hazardous waste on drip pads are also subject to certain closure requirements. For a more detailed discussion concerning generator closure requirements, see Section 3 of this Guide.

Upon closure, owners/operators may also choose to remove and dispose of old drip pads at a facility. These drip pads will most likely be considered listed hazardous waste by virtues of being **debris** which is

contaminated with a listed hazardous waste (e.g., F032, F034, F035). In such cases, it is possible to grind and separate the drip pad into those portions which do contain listed hazardous waste, and those that remain uncontaminated because they never had any contact with a listed waste at all. By separating the two waste streams, owners/operators can reduce waste management costs by sending only those portions of the drip pad that are contaminated with listed hazardous waste to a hazardous waste landfill.

Frequently Asked Questions

The following are frequently asked questions concerning regulatory scenarios encountered at wood preserving facilities. Please consult the appropriate implementing agency for final regulatory determination regarding site-specific situations.

Question 1
Closure Timeframe

- **Once a large quantity generator begins closure activities on a Subpart W drip pad, is there a specific timeframe during which closure activities must be completed?**

  There is no specified time frame during which generators accumulating hazardous waste on drip pads must complete closure activities; however, other RCRA regulations may prevent owners/operators from accumulating hazardous waste on-site longer than 90 days without obtaining a RCRA permit. Section 262.34 allows large quantity generators to accumulate hazardous waste on-site for up to 90 days. A large quantity generator in the process of closing a drip pad will, in fact, lose its generator status if closure activities necessitate storing hazardous waste on site for longer than 90 days. If the 90-day limit is exceeded, the facility will enter interim status, and all applicable closure timelines for interim status facilities will apply.

  Although no timeframes exist for generator closure activities on the Federal level, owners/operators should consult the appropriate State hazardous waste agency to learn of possible State regulations. Many States allow no more than 180 days to complete closure activities.

Question 2
Drip Pad Cleaning

- **Subpart W requires owners/operators to clean the hazardous waste drip pads to allow for weekly inspections. Is shoveling the drip pad considered an appropriate method for meeting this requirement?**

EPA intentionally developed the drip pad cleaning requirements to be performance-based. Thus, any method that allows owners/operators to effectively conduct the required weekly inspection of the drip pad is appropriate. When performing cleaning activities, owners/operators must take special precautions to avoid damage to the impermeable surface of the drip pad (if owners/operators have chosen to comply with that design option).

Question 3
Curbs on Covered Drip Pads

- **If a drip pad is covered by a roof, is a curb required?**

In order to meet the Subpart W drip pad design criteria, a drip pad must have a curb to prevent precipitation run-off and run-on. However, if a drip pad is inside or under a cover (i.e., a roof) and the surrounding landscape is graded so that run-on cannot occur, the drip pad curb need not be very high to prevent run-on and run-off of rain occurring during a 24-hour, 25-year storm. The requirement in §265.443(f) is designed for those facilities that do not have enclosed drip pads.

Structures built over drip pads should meet the following specifications:

1. The structure must cover the drip pad entirely and have eaves that extend beyond the curb of the drip pad to prevent most wind-blown rain from hitting the drip pad. Owners/operators may also install walls outside the curb to serve the same purpose.

2. Owners/operators should install rain diverters, gutters, or similar devices that prevent water from running off the roof and onto the drip pad.

Question 4
Certification of Operating Practices

- **Is the professional engineer (PE) certification required to address operating conditions at the facility in addition to assessing and certifying the drip pad's integrity?**

No, the purpose of the PE certification is to assess the physical and structural aspects of the drip pad, not the facility's operating practices.

Question 5
Upgrading Drip Pads

- **Are owners/operators of existing drip pads required to upgrade their pads to meet all of the design criteria of Subpart W? If so, when must these upgrades be complete?**

No, the final drip pad standards do not contain a final deadline by which owners/operators must upgrade their drip pads to install liners and leak detection systems. Instead, owners/operators of existing pads that have not been upgraded must continue to annually certify the integrity of their existing drip pad until such upgrades are completed. A written plan for upgrading is only required if the treater plans to upgrade the drip pad to include a liner. Such plans must be submitted at least two years prior to upgrading.

Question 6 Collection System and Drip Pad Clean-out

- **After cleaning the drip pad and the collection system (sumps) every 90 days, as required for large and small quantity generators, how long can the hazardous waste remain on site?**

If the hazardous waste is placed in satellite accumulation areas, the waste can remain there until the drum is full. Once the drum is full, it must be dated and moved to the hazardous waste storage area. The 90 or 180 day accumulation clock starts once the hazardous waste has been sealed into a drum or placed in a tank.

Additional information is available on the subjects discussed above:

- For general information on RCRA, refer to EPA's RCRA Orientation Manual, 1990 Edition, EPA/530-SW-90-036.

- For information on the specific regulations, consult the following sections of the Code of Federal Regulations:

  - New vs. Existing Drip Pad — 40 CFR 265.440
  - Assessment of Existing Drip Pad Integrity — 40 CFR 265.441
  - New Drip Pad Design Standards — 40 CFR 264.573 and 265.443
  - Sealed Drip Pads — 40 CFR 265.442
  - Drip Pad Liners — 40 CFR 264.573 and 265.443
  - Leak Detection/Collection Systems — 40 CFR 264.573 and 265.443
  - Uncovered Drip Pads — 40 CFR 265.440
  - Drip Pad Operations — 40 CFR 265.443
  - Temporary Accumulation of Hazardous Waste on Drip Pads — 40 CFR 262.34
  - Releases of Hazardous Waste from Drip Pads — 40 CFR 265.443, 265.445
  - Recordkeeping and Reporting Requirements — 40 CFR 265.444
  - Contingency Plans — 40 CFR 265.440
  - Closure of Drip Pads — 40 CFR 265.111, 265.114, 265.445.

SECTION 6
STORAGE YARDS

Introduction

Most wood preserving facilities maintain storage yards to hold treated charges of wood until they are sent off-site for sale. Because of the high cost of controlling wastes in storage yards (e.g., building storage sheds and paving storage yards), EPA has imposed minimal RCRA regulation on the management of storage yards at wood preserving facilities. Because of enhanced waste minimization efforts throughout the wood p5reserving industry and the drip pad operating standards of Subpart W, little waste, if any, is generated in these areas.

The drip pad regulations require that all treated wood (from both pressure and non-pressure processes) be held on drip pads until drippage has ceased. Incidental and infrequent drippage in the storage yard from a charge that stopped dripping before it was removed from the drip pad is not considered illegal disposal if it is cleaned up within 24 hours (or 72 hours if the drippage occurs on a holiday or weekend) in accordance with the facility's contingency plan. Drippage that is cleaned up must be handled as hazardous waste.

The contingency plan must be developed and maintained on file at the facility. The contingency plan must describe how the facility will:

- Clean up any drippage within 72 hours of occurrence (not detection)
- Document the cleanup of such drippage, and retain records of the cleanup for a period of three years
- Manage any contaminated media (e.g., soil, water) as F-listed hazardous waste or characteristic hazardous waste.

EPA expects an adequate storage yard contingency plan to include frequent storage yard inspections, to ensure that incidental drippage and soils are cleaned up within 24 hours (72 hours if over a holiday or weekend).

EPA encourages owners/operators of facilities to develop grid locator systems in their storage yards to facilitate the tracking of cleanup activities. In addition, EPA also recommends constructing covered storage yards to reduce the potential of run-off contamination.

StormwaterRun-off in Storage Yards

Generally, stormwater runoff in storage yards is not considered a listed waste. EPA has clarified that the hazardous waste listings for wood preserving chemicals do not apply to precipitation run-off from treated wood in storage yards without drip pads, where the owner or operator has allowed the treated wood to sit on the drip pad until all drippage has ceased. This is consistent with EPA's general position that the derived-from rule does not apply to precipitation run-off (see 40 CFR 261.3(c)(2) and 45 FR 33096; May 19, 1990). Stormwater that falls onto the drip pad, however, and that is collected and disposed, will be considered a listed waste and subject to RCRA regulation.

As discussed above, owners/operators must keep treated wood on drip pads until all drippage has ceased. In order for precipitation run-off in storage yards not to be considered a listed hazardous waste, an owner/operator must show through its records that the facility complies with this requirement. In the case of incidental drippage in storage yards, owners/operators must maintain a spill contingency plan for such occurrences. If the facility does not have documentation that it is in compliance with Subpart W, EPA can assert that the stormwater transported a listed hazardous waste and that the resulting sludge also carries the listing.

EPA encourages the construction of stormwater run-off mitigation systems and the appropriate handling of sediments generated as a result of such management. In addition, any of these wastes may exhibit a characteristic of hazardous waste, even though they may not meet a listing description.

Additional information is available on the subjects discussed above:

- For information on the specific regulations, consult the following section of the Code of Federal Regulations:
  - Storage yard contingency plans — 40 CFR §265.440(c).
- For more information on the management of drippage in storage yard, consult the regulatory interpretive correspondence dated May 31, 1991, written from Lowrance to Hazardous Waste Management Division Directors. This memorandum is also a part of the RCRA Permit Policy Compendium, #9489.1991(02).

SECTION 7
TANKS AND SUMPS

Introduction

Tanks are used by wood preserving facilities in a number of ways. Some tanks are used to mix and store preservative solution, while others are used to store and treat hazardous waste generated as a result of wood preserving operations. Tanks that are used to mix and store preservative solution which does not contain RCRA hazardous waste are not covered by the regulations described below. If, however, tanks are used to accumulate, store, or treat waste from the wood preserving process, such as hazardous waste drippage from Subpart W drip pads, the tanks are governed by RCRA Subpart J requirements.

Both large and small quantity generators accumulating hazardous waste in tanks are required to comply with the requirements in Subpart J. Large quantity generators must follow the interim status tank standards in 40 CFR Part 265, and small quantity generators are governed by special tank standards, also in Part 265, Subpart J.

Note: *A small number of wood preserving facilities perform non-pressurized wood treatment using large tanks of preservative formulation in which charges of wood are submerged. If the facility has not been equipped with a Subpart W drip pad, the charge must remain over the tank until all drippage has ceased.*

Sumps are man-made reservoirs built into the ground that are designed to capture waste from troughs or trenches. Sumps **meet the definition of tanks under RCRA**, and are subject to regulation under Subpart J. Both tanks and sumps are often used to capture waste from drip pads.

Tanks and sumps that are part of wastewater treatment units may be exempt from RCRA regulation if they are otherwise subject to regulation under the Clean Water Act (CWA).

This section of the Compliance Guide will discuss the following RCRA requirements that apply to tanks:

- Tank Assessment
- Secondary Containment and Leak Detection
- Ancillary Equipment
- Operating and Maintenance Requirements
- Inspections

- Response to Releases
- Closure
- Underground Storage Tanks (USTs).

New vs. Existing Tanks

Different regulatory requirements apply depending on whether tanks are classified as "existing" or "new" under RCRA. The "new" versus "existing" distinction dictates when secondary containment systems must be installed. Tanks which held hazardous waste before July 14, 1986 (the effective date of applicable EPA regulations), are classified as "**existing**," while tanks that began holding hazardous waste after that date are considered "**new**." New tanks also include reinstalled and replacement tanks or components.

All tanks must be assessed to evaluate structural integrity and compatibility with the wastes that the tank will hold. The assessment must address design standards, corrosion protection, testing, and the age of the tank.

Assessment of Existing Tanks

Most existing tanks do not have to meet the technical standards for new tanks until the tank system is 15 years old. To ensure the tank's structural integrity until then, existing tanks without secondary containment systems (secondary containment systems are discussed in detail below) must be assessed for leakage and overall fitness. The assessment must show that the tank is not leaking and is otherwise fit for use. This assessment was to have occurred by January 12, 1988.

An assessment of an existing tank must verify that the tank was designed and maintained to contain the particular wastes stored or treated without failing, collapsing, or rupturing. The written assessment must be certified by a registered professional engineer and placed in the facility's operating log.

Assessment of New Tanks

New tanks must satisfy the following requirements:

- The system must have adequate foundations, structural support, and corrosion protection to prevent collapse, rupture, or failure.
- All seams and connections must be adequately sealed.
- Facilities must prepare a written design assessment, which must be certified by a registered professional engineer and kept in the operating log.

New tanks must be inspected prior to use by a registered professional engineer to ensure no damage to the tank occurred during tank installation or that necessary repairs were properly performed. All new tanks and ancillary equipment must be tested for tightness, and any leaks must be remedied before the tank may be used. The assessment must ensure the following:

- Design and method of operation will protect underground components from damage caused by vehicle traffic.
- Tank foundations will support the load of a full tank.
- Tank is anchored to prevent floating or dislodgment.
- Tank can withstand the effects of frost.
- Backfill, used for underground tank systems, made up of noncorrosive, porous, and homogeneous materials, has been placed to ensure proper support.
- Ancillary equipment has been supported and protected against physical damage.

Corrosion Protection

New tanks and tank system components made in whole or in part of metal must have adequate corrosion protection if the system will be in contact with soil or water. One or more of the following corrosion protection methods is required:

- Use of materials that are corrosion-resistant.
- Corrosion-resistant coating in combination with cathodic protection (cathodic protection prevents corrosion by reversing naturally occurring electrical current in tanks, for example through the use of sacrificial anodes).
- Electrical isolation devices.

Regardless of the protection method used, installation of the corrosion protection system must be supervised by an independent corrosion expert.

Leak Detection and Secondary Containment

Secondary containment and leak detection systems allow detection of leaks from the primary or inner tank and provide an emergency, short-term secondary barrier to contain releases and prevent them from entering into the environment. These systems also provide protection from spills caused by operational errors, such as overfilling. Large sumps under retort areas should not be considered secondary containment if they routinely hold hazardous wastes generated from the retort.

All new hazardous waste tank systems not otherwise exempted from regulation must have secondary containment and leak detection. Secondary containment and leak detection for existing tanks is to be phased in over time, based on the age of the tank and its hazardous waste contents. For example, existing tanks of known and documented age must have detection and containment within two years after January 12, 1987, or when the tank system has reached 15 years of age.

A secondary containment system must satisfy the following requirements:

- Designed, installed, and operated so that no waste is released to surrounding soil, groundwater, or surface water
- Constructed of material or liner that is compatible with the waste being stored or treated in the tank
- Capable of containing accumulated waste until it is removed (accumulations must be removed within 24 hours)
- Structurally strong enough to prevent failure
- Foundation must be capable of resisting failure due to normal movement of the surrounding soils.

Leak Detection Systems

As part of the secondary containment system, hazardous waste tanks must be equipped with a leak detection system capable of detecting failure either in the primary or secondary containment structures. The presence of accumulated materials in the secondary containment system must be detected within 24 hours or at the "earliest practicable time." Thermal conductivity sensors, electrical resistivity sensors, and vapor detectors are common leak detection devices. Daily visual inspections may be used where tanks and tank components are accessible.

Secondary Containment Devices

Secondary containment systems prevent waste leaking from the tank from migrating to the soil, groundwater, or surface water. The containment device must be capable of detecting and collecting releases and must be:

- Constructed of or lined with materials compatible with the waste to be contained
- Strong enough to prevent failure from pressure, contact with the waste, climate, and the stress of daily operations
- Placed on a foundation capable of supporting the system
- Equipped with a leak detection system
- Sloped or otherwise designed to drain or remove liquids resulting from spills, leaks, or rain.

Hazardous waste tank regulations require the use of one of the following four secondary containment systems:

- An **external liner** designed to work in connection with a barrier — the liner must be free of cracks and should completely surround the unit with an impermeable material. The liner can be made of many different types of materials, including synthetic membranes, concrete, clay, cement, or asphalt, and must be large enough to contain 100 percent of the capacity of the largest hazardous waste tank within its boundary. The liner must be designed to prevent run-on and run-off.

- A **vault**, which is an underground area designed to contain releases not visible to the operator — if the vault is constructed of concrete, it must have a waterproof exterior and must be lined inside with a leak proof sealant. The vault must be large enough to contain 100 percent of the capacity of the largest hazardous waste tank within its boundary and must be equipped with protection against the formation and ignition of vapor within the vault.

- A **double-walled tank** ("tank within a tank") — this option is considered to be the most protective. A double-walled tank must be designed and constructed so that any release from the inner tank is completely contained by the outer tank. Such tanks must be equipped with built-in, continuous leak detection.

- An **alternative equivalent device**, subject to the approval of the EPA Regional Administrator.

Exemption from Secondary Containment Requirement

Some tanks may automatically qualify for an exemption from secondary containment and leak detection requirements. One exemption applies to tanks, including sumps, that serve as part of a secondary containment system. This exemption does not apply to drip pad sumps as these sumps serve as primary, not secondary, containment systems.

Secondary Containment for Ancillary Equipment

All ancillary equipment must have full secondary containment. Ancillary equipment includes devices such as piping, fittings, flanges, valves, and pumps, that are used to distribute, meter, or control the flow of hazardous waste from its point of generation to a storage or treatment tank. Examples of secondary containment for ancillary equipment include use of a trench, jacketing, or double-walled piping. If inspected daily, the following equipment is exempt from this requirement:

- Aboveground piping
- Welded flanges, joints, and connections
- Seal-less or magnetic coupling pumps
- Aboveground pressurized piping systems with automatic shut-off devices.

Operating and Maintenance Requirements

Hazardous waste tanks and secondary containment systems must be operated so that releases will be minimized or eliminated. Spills or overflows from the tank or secondary containment system must be prevented by:

- Using spill prevention controls, such as check valves
- Using overfill prevention controls such as alarms and automatic feed cutoffs
- Maintaining sufficient distance between the top of the tank and the surface of the waste in the tank (freeboard).

Inspections

To verify that hazardous waste tanks, components, and secondary containment systems are operated and maintained in satisfactory condition, routine inspections are required. Records of all tank inspections should be kept in the operating log.

The following tank system components must be inspected at least once a day:

- Overfill/spill control equipment to ensure it is in good working order
- Aboveground portions of the tank system to detect corrosion or release of waste
- Data gathered from monitoring and leak detection equipment
- Construction materials and the area immediately surrounding the accessible portion of the tank system, including secondary containment structures, to detect corrosion or waste release.

The cathodic protection system must be inspected within six months of installation and annually thereafter. All sources of impressed current (a specific type of corrosion protection using direct current from an external source) must be inspected and/or tested at least every other month.

Response to Releases

A tank system or secondary containment system that has leaked must be taken out of operation immediately. The flow of waste into the tank must be stopped, and the system must be inspected to determine the cause of

the release. All visible contamination must be removed and properly disposed. Any waste remaining in the tank must be removed within 24 hours.

Unless the release is exempt (leaks of less than one pound that are immediately contained are exempt from Federal reporting obligations), the facility must immediately notify the EPA Regional Administrator or the National Response Center (NRC) and submit a follow-up written report to the EPA Regional Administrator within 30 days.

The tank must then be repaired, equipped with secondary containment (if not already equipped), or closed. If the leaking component is aboveground and can be inspected visually, secondary containment does not need to be provided after repair.

If any of the repairs are major, they must be certified by a registered professional engineer; this certification must be submitted to the EPA Regional Administrator within seven days after returning the system to service. Except for the notification and reporting requirements, the above procedures apply even if a release has been contained by a secondary containment system.

Closure

When a tank containing hazardous waste at a wood preserving facility is no longer used, or abandoned, owners/operators must complete proper closure activities to complete their regulatoryresponsibilities. Whenever possible, a storage or treatment tank system must be "clean closed" by removing or decontaminating all waste residues, contaminated containment system components, and contaminated soils, structures and equipment. If clean closure is not possible, the facility may opt to leave the contamination in place. If this occurs, the facility must develop a plan for taking care of the remaining waste for a number of years after closure, similar to that developed for a landfill.

Underground Storage Tanks

EPA has developed a separate regulatory program for underground storage tanks (USTs). Tanks regulated under this program contain what are called "regulated substances" which include petroleum products and hazardous substances as defined under CERCLA. The primary distinction between the regulations described above and USTs is the content of the tanks. Specifically, underground storage tanks are those underground tanks storing "regulated substances." The definition of regulated substance specifically excludes any RCRA hazardous wastes. Thus, any tank holding a RCRA hazardous waste will not be subject to the Part 280 underground storage tank regulations.

Additional information is available on the subjects discussed above:

- For general information on RCRA, refer to EPA's RCRA Orientation Manual, 1990 Edition, EPA/530-SW-90-036.
- For information on the specific regulations, consult the following sections of the Code of Federal Regulations:
  - Exclusion from Tank Regulations — 40 CFR §§ 264.1(c)(10); 270.1(c)(2)(v)
  - New vs. Existing Tanks — 40 CFR §260.10
  - Assessment of Existing Tanks — 40 CFR §265.191
  - Design of New Tanks — 40 CFR §265.192
  - Secondary Containment and Leak Detection — 40 CFR §265.193
  - Variance from Secondary Containment Requirements — 40 CFR §265.193(g)
  - Secondary Containment for Ancillary Equipment — 40 CFR §265.193(f)
  - Operating and Maintenance Requirements — 40 CFR §265.194
  - Inspections — 40 CFR §265.195
  - Response to Releases — 40 CFR §265.196
  - Closure — 40 CFR §265.197
  - Underground Storage Tanks — 40 CFR Part 280.

SECTION 8
ADDITIONAL FEDERAL STATUTORY REQUIREMENTS

Clean Water Act

In 1972, Congress passed the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA). The goal of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's surface waters by prohibiting the discharge of pollutants to surface waters in toxic amounts.

The CWA regulates both direct and indirect discharges. Direct discharges or "point source" discharges are from sources such as pipes and sewers. Indirect discharges through publicly-owned treatment works (POTWs) are regulated by the industrial waste pretreatment program.

NPDES Program

The National Pollutant Discharge Elimination System (NPDES), promulgated pursuant to CWA §402, is the national program for issuing, monitoring, and enforcing permits for direct discharges of pollutants to the navigable waters of the United States. NPDES permits, issued by either EPA or an authorized State, contain industry-specific, technology-based and/or water quality-based effluent limits, and establish pollutant monitoring and reporting requirements. A facility that intends to discharge into the nation's waters must first obtain an NPDES permit. A permit applicant must provide quantitative analytical data identifying the types of pollutants present in the facility's effluent discharge. The permit will then set forth the conditions and effluent limits under which a facility may discharge.

The NPDES permit application, whether for a new discharge or for an existing discharge, requires extensive information about the facility and the nature of the discharge from the facility. EPA application forms include Form 1 (general information), Form 2 (detailed information on existing sources), Form 2D (detailed information on new sources and new discharges), Form 2E (for facilities that discharge only non-process wastewater), and Form 2F (for stormwater discharges). State application forms must, at a minimum, require the information required by EPA's forms.

One of the primary purposes of the NPDES permit is to establish effluent limitations. The CWA mandates a two-part approach to establishing effluent limitations. First, all dischargers are required to meet specific established treatment levels. The effluent limitations for the wood

preserving industry are found in 40 CFR Part 429. Second, more stringent requirements must be met where necessary to achieve water quality goals for the particular body of water into which the facility discharges.

Stormwater Discharges

In 1987, Congress amended the CWA and created a program for the comprehensive control of stormwater discharges. Pursuant to that delegated authority, EPA established a stormwater program which requires facilities to obtain a permit for stormwater discharges associated with industrial activity, including discharges to a municipal storm sewer.

All wood treating plants, regardless of size, must obtain an NPDES permit for stormwater discharges. The permit is a legally enforceable agreement between the regulatory agency (either EPA or the State) and the industrial facility that governs the quality of stormwater effluent released into receiving waters, such as creeks, streams, ponds, and rivers.

EPA published permit application requirements for stormwater discharges associated with specific industrial activities in the *Federal Register* on November 16, 1990 (55 FR 47990). The regulations outline three permit application options for stormwater discharges associated with industrial activity:

1 - Submit an individual application. An individual permit application requires detailed quantitative information based on sampling of stormwater discharges collected during storm events.

2 - Participate in a group application. Group applications allow similar dischargers to apply as a group for a permit. This type of permit reduces the cost of compliance for group members and the administrative costs for regulators. Additional information on group applications is provided in the September 29, 1995, *Federal Register* (60 FR 50804).

3 - File a Notice of Intent (NOI) to be covered under a general multi-sector stormwater permit. Under the multi-sector permit, stormwater dischargers have to develop site-specific pollution prevention plans based on industry-specific best management practices specified in the permit.

NPDES stormwater permits are issued by the EPA Regional office or by States authorized by EPA to administer the program. Contact your EPA Regional office to determine who is administering the program in your facility's jurisdiction.

Pretreatment Program

Industrial discharges that do not discharge directly into waters of the U.S., but instead discharge into a public sanitary sewer system are regulated under the CWA pretreatment program (CWA §307(b)). The national pretreatment program controls the indirect discharge of pollutants to POTWs by industrial users. Facilities regulated under §307(b) must pretreat their wastewater before discharging. The goal of the pretreatment program is to protect municipal wastewater treatment plants from damage that may occur when hazardous, toxic, or other wastes are discharged into a sewer system. Discharges to a POTW are regulated primarily by the POTW itself, rather than by the State or EPA. EPA has developed technology-based pretreatment standards for categories of industrial users of POTWs; different standards apply to existing and new sources within each category.

EPA's Office of Water, at (202) 260-5700, will direct callers with questions about the CWA to the appropriate EPA office. EPA also maintains a bibliographic database of Office of Water publications which can be accessed through the Ground Water and Drinking Water resource center, at (202) 260-7786.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), regulates chemicals with pesticidal properties that are sold in commerce as poisons. Many of the chemicals used by the wood preserving industry are regulated under FIFRA.

Wood preserving formulations must be registered with EPA by the producer. To register a chemical, an application package that includes product chemical composition and health risk data must be submitted to EPA.

Under FIFRA, products are classified as either a restricted-use or general-use pesticide. This classification must appear on product labels. Wood preserving formulations containing creosote, pentachlorophenol, and inorganic salts such as chromated copper arsenate are classified as restricted-use pesticides. The application of such formulations is therefore limited to licensed pesticide applicators or an individual under the direct supervision of a licensed pesticide applicator. Wood preserving facilities using these formulations must have at least one employee who is licensed to apply restricted-use pesticides. The standards for licensing are established by the Federal government or by State governments with Federal approval. (A list of State contacts for licensing is provided in Appendix B).

In addition to the licensing requirements, wood preserving facilities using arsenic are required to either conduct air monitoring on personnel working in areas where arsenic exposure might occur or require operators to wear respirators. This air monitoring and associated recordkeeping must be done in accordance with EPA's Permissible Exposure Limit (PEL) Monitoring Program. The analytical results from the PEL Monitoring Program must be submitted annually to PEL Monitoring, U.S. EPA.

Wood Products Contact
PEL Monitoring (2223A)
Manufacturing Branch
U.S. Environmental Protection Agency
401 M Street, SW
Washington, D.C. 20460

In order to educate consumers on the safe and proper handling of wood treated with creosote, pentachlorophenol, and inorganic arsenicals, a voluntary **Consumer Awareness Program** was established jointly by EPA and the wood preserving industry. Through the program, a Consumer Information Sheet (CIS) containing information about treated wood is distributed to end-users at the time of sale or delivery. The CIS contains language agreed upon by EPA and the wood treatment industry. The primary responsibility for ensuring that the CIS is distributed to the consuming public resides with the wood treaters. They are responsible for distributing CISs and signs and placards to their retailers, wholesalers, and distributors, and attaching a CIS to each bundle or batch of pressure treated wood as well as to each invoice.

EPA's National Pesticides Telecommunications Network, at (800) 858-PEST, answers questions and distributes guidance regarding the registration of pesticides, labeling, the PEL Modeling Program, and the Consumer Awareness Program. The Network operates weekdays from 6:30 a.m. to 4:30 p.m., PST, excluding Federal holidays.

Clean Air Act

The Clean Air Act (CAA) is the principal Federal statute governing air pollution and is administered by EPA. EPA may grant States the authority to administer certain provisions of the CAA following approval of State Implementation Plans (SIPs).

Currently, the CAA does not impact wood preserving processes directly, however several portions of the Act may affect facility operations. For instance, boilers burning sawdust for fuel may be regulated for particulates emitted to the atmosphere. Some States regulate kilns using natural gas

for fuel, and require a permit for their use. If you use a fuel oil or diesel back-up, your State may require emissions data on sulfur dioxide.

Title I of the CAA established New Source Performance Standards (NSPSs), which are national emission standards for new stationary sources falling within particular industrial categories. The NSPS regulations in 40 CFR 60.110b - 60.117b might apply to an oil borne wood processing facility if the facility uses a process tank that has a design capacity of over 40 cubic meters and was built after July 23, 1984.

Pursuant to the CAA, EPA has established National Emission Standards for Hazardous Air Pollutants (NESHAPs). NESHAPs are national standards oriented toward controlling particular hazardous air pollutants (HAPs). Wood treating plants are not currently regulated under these rules. Although arsenic, copper, chromium, and pentacholorphenol are listed as HAPs, no standards have been established for them.

Under the CAA Title V, each industrial source of air emissions that is defined as a Òmajor sourceÓ must submit a permit application. One purpose of the permit is to include all air emissions requirements that apply to a given facility in a single document. A Òmajor sourceÓ is defined as a stationary source that:

- Emits or has the potential to emit 100 tons per year of any pollutant listed under §302 of the CAA.

- Emits or has the potential to emit certain criteria pollutants (volatile organic compounds, nitrogen oxides, sulfur oxides, carbon monoxide, lead, and particulates) in non-attainment areas designated under Title I.

- Emits or has the potential to emit 10 tons per year of any HAP (listed in CAA §112(b)), or 25 tons per year of any combination of HAPs, or any source subject to NSPSs or NESHAPs.

Most wood treating facilities will be considered minor sources of air pollution; however, documentation to establish this classification may be requested by EPA or the State. One method of calculating emissions potential is to review equipment specifications provided by the designer or supplier. Other calculation methods include evaluating the quantities of chemicals purchased and processed per year.

In the 1990 Clean Air Act Amendments, Congress added subsection (r) to CAA section 112 for the prevention of chemical accidents. The goals

of the chemical accident prevention provisions are to focus on chemicals that pose significant hazard to the community should an accident occur, to prevent their accidental release, and to minimize the consequences of such release. Regulations for the §112(r) Risk Management Program are currently being established by EPA. To date, EPA has established the list of chemicals and thresholds for on-site storage and use, but not the requirements for risk management plans. These rules may be applicable to wood preserving facilities. EPA's EPCRA Hotline will be able to provide specific information about this reporting requirement when it is published in the *Federal Register*.

EPA's Control Technology Center, at (919) 541-0800, provides general assistance and information on CAA standards. The Stratospheric Ozone Information Hotline, at (800) 296-1996, provides general information about regulations promulgated under Title VI of the CAA, and EPA's EPCRA Hotline, at (800) 535-0202, answers questions about accidental release prevention under CAA §112(r). In addition, the Technology Transfer Network Bulletin Board System (modem access (919) 541-5742) includes recent CAA rules, EPA guidance documents, and updates of EPA activities.

Comprehensive Environmental Response, Compensation, And Liability Act

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as Superfund, authorizes EPA to respond to releases, or threatened releases, of hazardous substances that may endanger public health, welfare, or the environment. CERCLA also enables EPA to force parties responsible for environmental contamination to clean it up or to reimburse the Superfund for response costs incurred by EPA. The Superfund Amendments and Reauthorization Act (SARA) of 1986 revised various sections of CERCLA, extended the taxing authority for the Superfund, and created a free-standing law, SARA Title III, also known as the Emergency Planning and Community Right-to-Know Act (EPCRA). A discussion of the EPCRA regulations follows the discussion of CERCLA.

The CERCLA hazardous substance release reporting regulations found in 40 CFR Part 302 direct persons in charge of facilities to report to the National Response Center (NRC) any release of a hazardous substance which within a 24-hour period equals or exceeds a designated reportable quantity (RQ). The NRC, located at U.S. Coast Guard Headquarters ((800) 424-8802), is a national communications center continuously staffed to handle activities related to spills and releases.

Hazardous substances and RQs are defined and listed in 40 CFR §302.4. Arsenic, chromium, cresote, and pentachlorophenol are a few of the hazardous substances listed in 40 CFR §302.4 often found at wood preserving facilities and for which reporting may be required. The RQs for these substances are:

- Arsenic - 1 lb.
- Chromium - 5,000 lbs.
- Creosote - 1 lb.
- Pentachlorophenol-10 lbs.

The Superfund Hotline can provide RQs for other specific hazardous substances and assist in determining which releases are reportable. A report of a release may trigger a response by EPA, or by one or more Federal or State emergency response authorities.

EPA implements hazardous substance responses according to procedures outlined in the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 CFR Part 300). The NCP includes provisions for permanent cleanups, known as remedial actions, and other cleanups referred to as "removals." EPA generally takes remedial actions only at sites on the National Priorities List (NPL), which currently includes approximately 1300 sites. As of May 1996, approximately 45 sites were on the NPL because of contamination stemming from wood preserving operations.

EPA's RCRA/Superfund/UST Hotline, at (800) 424-9346, answers questions and references guidance pertaining to the Superfund program. The Hotline operates weekdays from 9:00 a.m. to 6:00 p.m., EST, excluding Federal holidays.

Emergency Planning And Community Right-To-Know Act

The Superfund Amendments and Reauthorization Act (SARA) of 1986 created the Emergency Planning and Community Right-to-Know Act (EPCRA), also known as SARA Title III. This law was designed to improve community access to information about potential chemical hazards and to facilitate the development of chemical emergency response plans by State and local governments. EPCRA required the establishment of State Emergency Response Commissions (SERCs), responsible for coordinating certain emergency response activities and for appointing Local Emergency Planning Committees (LEPCs).

EPCRA regulations, at 40 CFR Parts 350-372, establish four types of reporting obligations for facilities which store or manage specified chemicals:

- **EPCRA §302 - Emergency Planning** requires facilities to notify their SERC and LEPC of the presence of any extremely hazardous substance (EHS) in excess of the substance's threshold planning quantity (TPQ) (the list of EHSs and TPQs is in 40 CFR Part 355, Appendices A and B). EPCRA §302 also directs facilities to appoint an emergency response coordinator. It is unlikely that this section of EPCRA is applicable to the wood preserving industry because the types of chemicals generally stored do not meet the regulatory definition of an extremely hazardous substance.

- **EPCRA §304 - Emergency Release Notification** requires facilities to notify the SERC and LEPC in the event of a release exceeding the reportable quantity of either a CERCLA hazardous substance or an EPCRA extremely hazardous substance which may affect persons beyond the facility's boundaries.

- **EPCRA §§311/312 - Hazardous Chemical Inventory Reporting** requires facilities at which a hazardous chemical, as defined by the Occupational Safety and Health Act, is present in an amount exceeding a specified threshold to submit material safety data sheets (MSDSs) and hazardous chemical inventory forms (also known as Tier I and II forms) to the SERC, LEPC, and local fire department by March 1 of every year. This information helps the local government respond to a spill or release of the chemical. Many of the chemicals used by wood treaters are defined as hazardous chemicals.

- **EPCRA §313 - Toxic Chemical Release Inventory** requires manufacturing facilities included in SIC codes 20 through 39, which have ten or more full-time employees, and which manufacture, process, or use specified chemicals in amounts greater than threshold quantities, to submit an annual toxic chemical release report by July 1 of every year. The SIC code for lumber and wood products is 24. This report, commonly known as the Form R, covers releases and transfers of toxic chemicals to various facilities and environmental media, and allows EPA to compile the national Toxic Release Inventory (TRI) database.

All information submitted pursuant to EPCRA regulations is publicly available, unless protected by a trade secret claim.

EPA's EPCRA Hotline, at (800) 535-0202, answers questions and distributes guidance regarding EPCRA regulations. A guidance document, ÒTitle III Section 313 Release Reporting Guidance, Estimating Chemical Releases from Wood Preserving Operations,Ó is available from the Hotline. The EPCRA Hotline operates weekdays from 9:00 a.m. to 6:00 p.m., EST, excluding Federal holidays.

Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) mandates that EPA establish regulations to protect human health from contaminants present in drinking water. The law authorizes EPA to develop national drinking water standards and to create a joint Federal-State system to ensure compliance with these standards. The SDWA also directs EPA to protect underground sources of drinking water through the control of underground injection of liquid wastes.

The SDWA may be of concern to the wood preservers if dry wells are used. If water contaminated with wood preservative is allowed to drain into a dry well, it could lead to contamination of underground sources of drinking water. Under the SDWA, a permit program for the safe disposal of wastes through controlled underground injection has been established. The Underground Injection Control (UIC) program (40 CFR Parts 144-148) regulates five classes of injection wells and may be applicable to wood treaters. UIC permits include design, operation, inspection, and monitoring requirements. Wells used to inject hazardous wastes must also comply with RCRA corrective action standards to be granted a RCRA permit, and must meet applicable RCRA land disposal restriction standards.

EPA's Safe Drinking Water Hotline, at (800) 426-4791, answers questions and distributes guidance pertaining to SDWA standards. The Hotline operates from 9:00 a.m. through 5:30 p.m., EST, excluding Federal holidays.

DOT's Hazardous Materials Transportation Act (HMTA)

The Department of Transportation (DOT) regulates all aspects of the shipping and receiving of hazardous materials when those activities are performed in commerce. ÒIn commerceÓ includes the shipping of hazardous materials typically found at wood treatment sites, such as chromium, pentachlorophenol, arsenic, and creosote, to an industrial facility for use in industrial processes.

Hazardous materials are those materials that DOT has determined may harm human health and the environment during shipping. Hazardous materials include specific hazardous chemicals, such as arsenic acid, but also include general hazardous categories, or classes. The DOT Hazardous Materials Table (49 CFR Part 172.101) includes a list of all hazardous materials, as well as requirements for proper shipment of listed items. The Hazardous Materials Table also provides information on proper containers and labels, as well as vehicle requirements.

DOT requires that proper shipping papers accompany all shipments of hazardous waste or hazardous materials. Shipping papers indicate what is being shipped, the quantity being shipped, and the particular hazards of the material. When shipping wood preserving chemicals, an Annotated Bill of Lading may be used that includes all required DOT shipping information. For shipping hazardous waste, a RCRA hazardous waste manifest must be used.

DOT's Hazardous Materials Information Line, at (800) 467-4922, provides general assistance and information on HMTA regulations. The Information Line operates weekdays from 8:00 a.m. to 5:30 p.m., EST, excluding Federal holidays.

Pollution Prevention Act

Congress enacted the Pollution Prevention Act in 1990 to promote pollution prevention in existing regulatory programs, including EPCRA, RCRA, CWA, and CAA. The first step in pollution prevention is the development and implementation of a pollution prevention plan. Wood preserving facilities are impacted by pollution prevention regulations related to the generation of hazardous and non-hazardous waste in the treating process, and through other activities and stormwater control measures.

For assistance in developing a facility pollution prevention plan, contact the regulatory Hotlines for the EPCRA, RCRA, CWA, and CAA programs.

Toxic Substances Control Act

The Toxic Substances Control Act (TSCA) grants EPA the authority to create a regulatory framework to collect data on chemicals in order to evaluate, assess, mitigate, and control risks which may be posed by their manufacture, processing, and use. Wood treating plants may be affected by a TSCA reporting requirement promulgated pursuant to section 8(c) of TSCA and found at 40 CFR §717. These regulations enable employees, consumers, the general public, or environmental advocacy

groups to allege that the chemicals used by a plant caused an adverse effect to their health or the environment that had not been previously identified. If such an allegation is made, it should be documented on company letterhead and placed in the company's TSCA 8(c) file for future reference.

EPA's TSCA Assistance Information Service, at (202) 554-1404, answers questions and distributes guidance pertaining to TSCA standards. The Service operates from 8:30 a.m. through 4:30 p.m., EST, excluding Federal holidays.

Additional information is available on the subjects discussed above. The following is a list of Code of Federal Regulation citations applicable to the wood preserving industry.

- For regulatory information on Clean Water Act, consult the following sections of the Code of Federal Regulations:
  - National Pollutant Discharge Elimination System - 40 CFR Parts 122 and 125
  - Effluent Guidelines and Standards for the Timber Products Processing Point Source Category - 40 CFR Part 429

- For regulatory information on FIFRA, consult the following sections of the Code of Federal Regulations:
  - Worker Protection Standards - 40 CFR Part 170
  - Certification of Pesticide Applicators - 40 CFR Part 171
  - For information about the PEL monitoring program, see Federal Register Vol.49, no.136, July 13, 1984, p28666-28689.

- For regulatory information on the Clean Air Act, consult the following sections of the Code of Federal Regulations:
  - New Source Performance Standards - 40 CFR §60.110b - 60.117b
  - National Emission Standards for Hazardous Air Pollutants - 40 CFR Part 61
  - Risk Management Programs - 40 CFR Part 68
  - National Emission Standards for Hazardous Air Pollutants for Source Categories - 40 CFR Part 63

- For regulatory information on the Superfund program, consult the following sections of the Code of Federal Regulations:
  - National Contingency Plan - 40 CFR Part 300
  - Hazardous Substance Release Reporting - 40 CFR Part 302

- For regulatory information on EPCRA, consult the following sections of the Code of Federal Regulations:
  - Emergency Planning - 40 CFR Part 355
  - Release Reporting - 40 CFR §355.40
  - Hazardous Chemical Inventory Reporting - 40 CFR Part 370
  - Toxic Chemical Release Reporting - 40 CFR Part 372

- For regulatory information on the Safe Drinking Water Act, consult the following sections of the Code of Federal Regulations:
  - Underground Control Program - 40 CFR Parts 144-148

- For regulatory information on DOT's Hazardous Materials Transportation Act, consult the following sections of the Code of Federal Regulations:
  - Hazardous Materials Table - 49 CFR §172.101

- For regulatory information on TSCA, consult the following sections of the Code of Federal Regulations:
  - Records and Reports of Chemical Health Effects - 40 CFR Part 717