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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260, 261, 262, 264, 265, 270, 271, and 302

[FRL-3448-2]

Hazardous Waste Management System: Identification and Listing of Hazardous Waste; Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities; Requirements for Authorization of State Hazardous Waste Programs; and Designation, Reportable Quantities, and Notification

AGENCY: Environmental Protection Agency.

ACTION: Proposed rule and request for comments.

SUMMARY: The Environmental Protection Agency (EPA) is today proposing to amend its regulations under the Resource Conservation and Recovery Act (RCRA) by listing as hazardous three additional wastes from wood preserving operations that use chlorophenolic, creosote, and/or inorganic (arsenical and chromium) preservatives, and by listing as hazardous one waste from surface protection processes that use chlorophenolics. Wastes from wood preserving and surface protection processes at facilities that previously used chlorophenolics are also included within the scope of the new listings. Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol is already listed as a hazardous waste (EPA waste K001). K001 wastes are not included in today's proposed listings. Comments are not solicited regarding K001 wastes. Comments received that address such wastes will not receive any response.

As stated above, the proposed listings would regulate as hazardous wastes generated from wood preserving and surface protection processes at facilities that previously used chlorophenolics and have changed to another preservative. These wastes are included due to the potential for them to be contaminated by hazardous constituents from chlorophenolic wastes. The Agency recognizes that facilities exhibiting cross-contamination can be cleaned or can have equipment replaced, resulting in the removal of any contamination. Consequently, the Agency is proposing an equipment cleaning or replacement performance standard for wood preserving and surface protection facilities that have changed formulations. Once the standard is met, the waste generated at that facility from processes that do not use chlorophenolic formulations will no longer meet the listing description. However, the waste may meet the description of another listing or it may exhibit a hazardous waste characteristic.

The Agency is proposing to add three compounds to the list of hazardous constituents in Appendix VIII of Part 261. Finally, EPA is proposing amendments to regulations promulgated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) at 40 CFR Part 302 that would designate the wastes proposed for listing as CERCLA hazardous substances and would establish the reportable quantities applicable to these wastes.

The effect of listing these four wastes will be to subject them to the hazardous waste regulations of 40 CFR Parts 262 through 266, 270, 271, and 124 of this chapter; the notification requirements of section 3010 of RCRA; and the notification requirements under CERCLA section 103.

DATES: EPA will accept public comments on this proposed rule until February 28, 1989. Comments received after the close of the comment period will be marked "late" and may not be considered. Any person may request a public hearing on this proposed amendment by filing a written request with EPA, to be received no later than January 17, 1989.

ADDRESSES: Comments on the RCRA proposal should be sent in triplicate to:

EPA RCRA Docket Clerk (OS-332), 401
M Street, SW., Room S-205,
Washington, DC 20460.

All comments must be marked "Docket Number F-88-WPWP-FFFFF."

Comments on the CERCLA proposal should be sent in triplicate to:

Emergency Response Division, Docket
Clerk, ATTN: Docket No. RQ, Room
LG-100, U.S. EPA, 401 M Street, SW.,
Washington, DC 20460.

Copies of materials relevant to this proposed rulemaking are located at U.S. EPA, 401 M Street, SW., Washington, DC 20460. The RCRA portions are located in the sub-basement; the public must make an appointment in order to review them by calling (202) 475-9327. The CERCLA portions are contained in Room LG-100; for an appointment call (202) 382-3046. Both dockets are available for inspection from 9:00 a.m. to 4:00 p.m., Monday through Friday, excluding holidays. The public may copy 100 pages from the docket at no charge; additional copies are $0.15 per page.

Requests for a public hearing should be addressed to Mr. Devereaux Barnes, Director, Characterization and Assessment Division (OS-300), Office of Solid Waste, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460.

FOR FURTHER INFORMATION CONTACT: The RCRA/CERCLA Hotline at (800) 424-9346 or, in the Washington, DC area, (202) 382-3000. For technical information on the RCRA portion of the proposal, contact Mr. Edwin F. Abrams, Listing Section, Office of Solid Waste (OS-333) at (202) 382-4787. For technical information on the CERCLA portion of the proposal, contact Ms. Ivette Vega, Response Standards and Criteria Branch, Emergency Response Division (OS-210) at (202) 475-7369. Both are available at U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460.

SUPPLEMENTARY INFORMATION: The contents of today's preamble are listed in the following outline:

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I. Background

Pursuant to section 3001 of Subtitle C of the Resource Conservation and Recovery Act (RCRA), this notice proposes to list as hazardous three wastes generated from wood preserving processes that use either chlorophenolic, creosote, and/or inorganic (chromium and arsenical) preservatives. In addition, the Agency is also proposing to list as hazardous one waste that is generated from surface protection processes using chlorophenolic formulations. Certain wastes from the wood preserving industry are currently regulated as hazardous or have been proposed for regulation under RCRA previously. The following discussion provides a brief overview of prior regulatory actions affecting wastes from the wood preserving and surface protection industries. Also provided is a brief summary of the Agency's basis for listing as hazardous the wastes covered by this proposed rule.

On May 19, 1980, EPA promulgated an interim final rule which listed as hazardous numerous wastes from specific and non-specific sources (see 45 FR 33084). Among others, EPA listed as hazardous one waste that is generated by wood preserving processes: EPA hazardous waste number K001—bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.

The Agency concurrently proposed to add wastewaters from wood preserving processes to the list of hazardous wastes from specific sources (see 45 FR 33137). Later that year, EPA decided to reopen the comment period on both the K001 listing and the proposed listing for wastewaters from wood preserving processes that use creosote and/or pentachlorophenol, after receiving additional information about those wastes (see 45 FR 77435, November 12, 1980). EPA provided a notice announcing the extended comment period on November 24, 1980 (see 45 FR 77466). While the Agency reopened the comment period on K001, the K001 listing remained in effect and was not suspended.

Also, on May 19, 1980, EPA promulgated final regulations for identifying hazardous wastes by their characteristics (i.e., the hazardous waste characteristics rules). These rules included the Extraction Procedure (EP) Toxicity Characteristic (see 45 FR 33137). Wastes exhibiting this characteristic are subject to regulation under Subtitle C of RCRA. Wastes from wood preserving processes that use inorganic preservatives can contain significant concentrations of arsenic and chromium which may cause solid wastes to be considered characteristically hazardous pursuant to 40 CFR 261.24. Consequently, the EP Toxicity Characteristic caused many wood preserving wastes to be subject to the hazardous waste regulations.

On June 13, 1986, as part of its regulations implementing the Hazardous and Solid Waste Amendments of 1984, the Agency proposed to amend the Extraction Procedure (EP) Toxicity Characteristic (40 CFR 261.24) by adding 38 additional organic compounds and introducing a new leaching procedure: The Toxicity Characteristic Leaching Procedure (51 FR 21648). Among these 38 organics are cresols and pentachlorophenol. If the proposed toxicity characteristic is made final, it may cause a number of wastes generated by the wood preserving and surface protection processes to be designated as characteristically hazardous because these toxicants—namely creosols and pentachlorophenol—are commonly present in wastes generated from wood treatment processes using creosote and chlorophenolic preservatives.

This proposed rule complies with a consent decree filed July 27, 1988, which settled several elements of a civil action filed on March 25, 1985 in U.S. District Court for the District of Columbia (Environmental Defense Fund and National Wildlife Federation v. Thomas *et. al.* No. 85-0974). One portion of this consent decree reads as follows:

> On or before December 31, 1988, EPA will take the following action with respect to pentachlorophenol wastes from the wood preserving industry:
>
> *Either*
>
> (A) EPA will issue a Notice of Proposed Rulemaking in the **Federal Register** proposing regulations with regard to such wastes (with such Notice of Proposed Rulemaking stating that the Agency shall use its best efforts either to promulgate these regulations in final form or to withdraw the proposed regulations by June 30, 1990);
>
> *Or*
>
> (B) EPA will publish in the **Federal Register** a notice announcing that the Agency has made a determination not to

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propose such regulations. Such a determination shall constitute final agency action.

Although EPA believes that the rule proposed today appropriately responds to the consent decree, the Agency acknowledges that the consent decree neither requires that EPA regulate nor mandates a specific statutory framework under which any regulations must be promulgated. The Agency will continue to evaluate the benefits of using other statutes, including FIFRA, to control the wastes proposed today for listing as hazardous. The Agency specifically solicits comments on the use of FIFRA or other statutes.

Furthermore, while EPA also believes that similar risks ascribe to creosote and inorganic preservatives, thereby justifying their inclusion in the proposed rule, the consent decree is silent with respect to them.

Today, EPA is proposing to amend Part 261.31 by adding four waste streams from wood preserving and surface protection processes that use organic and/or inorganic preservatives to the list of hazardous wastes from non-specific sources. The wastes (which are more fully described later) include wastewaters (including those proposed for listing on may 19, 1980, i.e., wastewaters from pentachlorophenol and creosote processes), process residuals, spent preservative formulations, and drippage from treated wood. Table 1 lists the constituents of concern that are present in the proposed listed wastes. The proposed listings do not include wastes already listed as K001, but would supplement the existing K001 listing and increase the quantity of waste from wood preserving processes regulated under Subtitle C of RCRA.

TABLE 1.—CONSTITUENTS OF CONCERN

	F032	F033	F034	F035
Chlorophenols:				
2,4,6-Trichlorophenol		X		
2,3,4,6-Tetrachloropenol		X		
Pentachlorophenol	X	X		
PAHs:				
Benz(a) anthrancene	X		X	
Benzo(a)pyrene	X		X	
Benzo(k)floranthene			X	
Dibenz(a,h)anthrancene	X		X	
Indeno(1,2,3-c,d)pyrene	X		X	
Naphthalene			X	
Dioxins and Furans:				
Tetrachlorodibenzo-*P*-dioxins	X	X		
Pentachlorodibenzo-*P*-dioxins	X	X		
Hexachlorodibenzo-*P*-doxins	X	X		
Heptachlorodibenzo-*P*-dioxins	X	X		
Tetrachlorodibenzofurans	X	X		
Pentachlorodibenzofurans	X	X		
Hexachlorodibenzofurans	X	X		
Heptachlorodibenzofurans	X	X		
Inorganics				
Arsenic	X		X	X
Chromium	X		X	X
Lead				X

Note: X indicates that constituents have been found to be present at levels of regulatory concern in individual waste numbers.

The Agency notes that the scope of K001 is not affected in any way by today's proposal. EPA is not soliciting comments in the K001 listing and will not respond to any such comments received. In a separate notice, also published today, EPA has responded to a petition from the American Wood Preservers Institute (published elsewhere is this issue) requesting that the Agency reconsider its interpretation that K001 waste may form from application of certain wood preserving wastewaters to spray irrigation fields and that the Agency more clearly define K001 sludge. (If the Agency finds that K001 sludges can form on spray irrigation fields, the petition further requests a suspension of the management standards of 40 CFR Part 264 in order to permit affected facilities to assess for the presence of K001 and to come into compliance or obtain an exclusion pursuant to CFR 260.22).

The use of chlorophenolic formulations in processes that preserve or protect wood has caused environmental contamination. Wastes generated from these processes contain high concentrations of chlorinated phenols that are contaminated with polychlorinated dibenzo-*P*-dixions (PCDDs) and polychlorinated dibenzofurans (PCDFs). While only one chlorophenol is a known carcinogen, the Agency has data confirming the systemic toxicity of at least three others. All of the PCDDs and PDDFs, except for octahomologues, are carcinogenic in low doses. The toxicity of these and other compounds found in wastes from wood preserving and surface protection processes that use chlorophenolics is discussed later in this preamble. Past mismanagement of these wastes has resulted in off-site contamination of soils and ground water with PCDFs, PCDDs, and chlorinated phenols. Such contamination is evidence that these substances are sufficiently persistent and mobile in the environment to meet the listing criteria of 40 CFR 261.11 (the basis for listing these wastes is described below).

Creosote is an oily distillate of coal that contains a mixture of compounds including aromatic hydrocarbons, phenolics, and other organics. Wastes from the preservation of wood with creosote contain high concentrations of polynuclear hydrocarbons (PAHs). Four PAHs commonly found in creosote wastes are known carcinogens while four others are known to be systemic toxicants. Past mismanagement of these wastes has led to off-site contamination of ground water, surface, water, and soils. Such contamination is evidence that PAHs are sufficiently persistent and mobile to present a substantial hazard to human health and the environment and meet the listing criteria of 40 CFR 261.11 (the basis for listing these wastes is described below).

Wastes from the preservation of wood with inorganic formulations of arsenic and/or chromium typically contain high concentrations of these toxic metals, as well as lead. Lead is believed to be a contaminant of the arsenic component. Because of the known toxicity and/or carcinogenicity of these metals, the EPA has previously promulgated drinking water standards for them. Contamination of ground water and soils with arsenic, chromium, and lead from past mismanagement of those wastes is evidence that these toxic constituents are sufficiently persistent and mobile to meet the listing criteria of 40 CFR 261.11 (the basis for listing these wastes in described below).

Because wastes from wood preserving and surface protection are capable of posing a threat to human health and the environment when improperly treated, stored, transported, disposed, or otherwise handled, the Agency is proposing that these wastes be listed as hazardous and subject to the requirements of 40 CFR Parts 124, 260 through 266, 268, 270, and 271.

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II. Summary of The Regulation

A. Overview of the Proposal

This notice proposes to add four wastes from wood preserving and surface protection processes to the list of hazardous wastes from non-specific sources (40 CFR 261.31). The four wastes are:

F032—Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes at facilities that currently use or have previously used chlorophenolic formulations (except wastes from processes that have complied with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.

F033—Wastewaters, process residuals, protectant drippage, and discarded spent formulations from wood surface protection processes at facilities that currently use or have previously used chlorophenolic formulations (except wastes from processes that have complied with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations).

F034—Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes that currently use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.

F035—Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes that currently use inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.[1]

EPA has found that these wastes typically and frequently contain toxic constituents, including some that are carcinogenic, that, when mismanaged, pose a substantial present or potential threat to human health and the environment. In addition, the Agency has compiled evidence to demonstrate that the toxic constituents are mobile and persistent in the environment and are capable of reaching receptors in harmful concentrations. The information that supports these findings is summarized in this preamble and is presented, in detail, in the Background Document and other materials which are available in the RCRA Docket for this proposal.

Upon promulgation of these proposed listings, all wastes meeting the descriptions would become hazardous waste. Waste generated prior to promulgation, however, would not be subject to numerous Subtitle C requirements until they are actively managed.

The scope of the F032 listing covers wastes from pressure and non-pressure processes using pentachlorophenol (PCP) as well as other chlorophenolic formulations. In addition, this listing covers wastes from creosote and inorganic processes at facilities that currently use or previously used pentachlorophenol (or other chlorophenolic formulations) because the wastes may be cross-contaminated with chlorinated dioxins and/or dibenzofurans.

Note.—This listing excludes, as do F034 and F035, those wastes already covered by K001.

The agency has concluded that cross-contamination is highly likely to occur under two circumstances: First, when creosote or inorganic processes are located at a facility where chlorophenolic processes are or were employed; and second, when creosote processes or inorganic processes use the equipment previously used for chlorophenolic processes. A discussion on the extent of cross-contamination at facilities which use chlorophenolics (or which previously used chlorophenolics) is presented later in this preamble.

The Agency is proposing equipment cleaning or replacement procedures for generators of F032 wastes which no longer use chlorophenolic preservatives. These procedures are designed to decontaminate and remove the dioxin and dibenzofuran contaminants from process equipment. Once the procedures are carried out to the specified standard, wastes generated in processes using non-chlorophenolic formulations will no longer meet the listing description of F032; however, these wastes may still be hazardous (i.e., they may still meet the listing description of F034 or F035 or exhibit one or more of the characteristics). Notification, recordkeeping, and reporting requirements are also included in the proposed rule and would have to be met. Generators should note that residues from the decontamination process will be regulated hazardous wastes and must be managed as F032.

The scope of the F033 listing would cover wastes from wood surface protection processes that currently use or previously used chlorophenolics, including those processes presently using a preservative that is not among those addressed by today's proposal. Surface protection facilities that currently use chlorophenolic formulations may be able to change to surface protection chemicals that are not regulated by this proposed listing. Wastes from these processes, however, would continue to be regulated under RCRA due to the cross-contamination resulting from residues that remain on-site (e.g., in process equipment) after the change in formulation is made. The Agency recognizes that cross-contamination of wastes may be avoided and is therefore proposing to apply the same equipment cleaning or replacement procedures and recordkeeping, notification, and reporting requirements to F033 wastes as would be applicable to F032 wastes. If these procedures are employed, wastes from surface protection facilities generated in processes that use non-chlorophenolic formulations may no longer meet the listing description. (EPA notes that this provision would not prevent the Agency from taking action to list wastes from surface protection processes using non-chlorophenolic formulations in the future, if such a listing is deemed necessary). In addition, wastes from non-chlorophenolic surface protection processes may also be regulated under RCRA as hazardous wastes if they exhibit any of the characteristics of a hazardous waste.

The scope of the F034 listing would cover all wastes generated by pressure and non-pressure wood preserving processes currently using creosote that are not contaminated by constituents from processes using chlorophenolic preservatives. This listing would not include wastes that are included in the K001 or F032 listings.

The scope of the F035 listing would cover all wastes generated by pressure and non-pressure wood preserving processes currently using inorganic preservatives containing arsenic or

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[1] While wood preserving processes that currently use inorganic preservatives do not generate K001 sludges per se, EPA believes that there may be numerous facilities that previously used chlorophenolic and/or creosote preservatives and have changed to inorganic preservatives in recent years without thoroughly cleaning process equipment. At such facilities there may be K001 wastes that were generated prior to changing preservatives, but that have not yet been actively managed. These sludges are K001 waste and are not included in the F035 listing.

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chromium that are not contaminated by constituents from processes using chlorophenolic preservatives. This listing would not include wastes that are included in the K001 or F032 listings.

Each listing includes excess preservative or protectant that drips or exudes from treated wood while it is stored or held at the wood preserving or surface protection facility after treatment (this includes long- and short-term storage areas, such as "kick-back" areas). This residual has been included in the listings because of its high concentrations of toxic constituents and the documented incidence of mismanagement by the industry. EPA has found many cases where such drippage or "kick-back" has been disposed of directly on the ground, resulting in widespread soil, surface water, and ground water contamination. Drippage may be washed off treated wood or may be carried away by rainwater and spread to nearby streams or other surface water bodies.

As a result of the proposed listing, generators of treated wood drippage would be subject to applicable hazardous waste requirements. Because information on waste management practices for treated wood drippage indicates that drip pads are often being installed at new wood preserving and surface protection facilities for purposes of drippage management, today's proposal includes provisions for establishing a new type of hazardous waste management unit: drip pads at wood preserving and our surface protection facilities.

Of course, generators may choose to install other types of waste management units to handle drippage (i.e., tanks or surface impoundments). In all anticipated cases, generators would become owners and operators of hazardous waste treatment, storage, and disposal facilities as a result of the proposed listing. Today's rule also includes a proposed amendment to the 90-day accumulation rule for generators that operate drip pads at wood preserving and surface protection facilities. Under this proposed amendment, generators who remove drippage from drip pads within 90 days would not be required to obtain RCRA Part B permits for their drip pads, provided that the pads comply with the proposed Part 365 technical standards for drip pads and certain other requirements (this aspect of the proposal is discussed in detail later in this preamble).

Residuals from the treatment, storage, or disposal of wood preserving and surface protection wastes that are included in today's proposed listing would also be classified as hazardous wastes by the "derived from" rule (40 CFR 261.3(c)(2)(i)). These "derived-from" wastes would include any treatment residual other than K001 bottom sediment sludges because the listing definition specifically excludes K001. For example, oil skimmings, oil absorbent materials, and ash or other residuals from treatment are subject to today's proposed listings.

In response to suggestions made by representatives of the wood preserving industry, EPA considered regulating wastes from wood preserving and surface protection processes under authorities provided by other statutes such as the Clean Water Act, the Toxic Substances Control Act (TSCA), and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). The Agency chose however, to propose regulating wastes from wood preserving and surface protection under RCRA. We are soliciting comment today supporting that decision, presenting contrary views, or presenting any pertinent information.

B. Description of the Industry

A wide variety of chemicals are currently used to preserve wood. Those most commonly used are pentachlorophenol, creosote, and inorganic arsenical and/or chromate salts (inorganics). Wood preservatives are used to delay deterioration and decay of wood caused by organisms such as insects, fungi, and marine borers. Surface discoloration (sapstaining) during short-term storage can be adequately controlled by a superficial application of preservative but, for long-lasting effectiveness, penetration of preservative to a uniform depth is required. This deep penetration is usually accomplished by forcing preservative into the wood under pressure, so that "pressure treated" is often used as a synonym for "preserved."

Preserved wood production and treatment chemical consumption are summarized in Table 2. In 1985, three major product groups accounted for 89 percent of the total production of preserved wood in the United States: (1) Lumber and timbers, mostly preserved with inorganic preservatives; (2) railroad cross ties, switch ties and bridge ties, almost all preserved with creosote; and (3) poles, 60 percent preserved with pentachlorophenol, 23 percent with creosote, and 17 percent with inorganic preservatives. The remainder of 1985 production consisted of fence posts, piling, plywood, crossarms, and other products (Micklewright, 1987).

TABLE 2.—PRESERVED WOOD PRODUCTION AND TREATMENT CHEMICAL CONSUMPTION, 1985

	Preservative type		
	Creosote solutions	Pentachlorophenol	Inorganics
Number of plants	122	113	448
Products treated:			
Crossties, switch and bridge ties (million cubic meters)	2.7	0.008	0
Lumber and timbers (million cubic meters)	0.21	0.08	7.7
Poles (million cubic meters)	0.5	1.3	0.38
Other (million cubic meters)	0.27	0.1	1.2
Total volume of wood preserved (million cubic meters)	3.7	1.5	9.3
Treating chemical consumed:			
Creosote and creosote/coal tar (million liters)	390	...	...
Petroleum solvent (million liters)	49	153	...
Pentachlorophenol (million kg)	...	11	...
Inorganic salts (million kg)	...	...	56

Source: Micklewright (1987).

The distribution of preservative use by the wood preserving industry is summarized in Table 3. Seventeen percent of the plants treat with more than one preservative. Wastes generated at these plants can be contaminated with constituents of all preservatives used at the plant.

TABLE 3.—DISTRIBUTION OF PRESERVATIVE USE, 1985

Plants treating with	No. of plants
Creosote	53
Creosote/Pentachlorophenol	24
Creosote/Inorganics	21
Pentachlorophenol/Inorganics	24
Pentachlorophenol	25
Inorganics	379
Creosote/Pentachlorophenol/Inorganics	24
Total	[1] 550

[1] An additional 17 plants treated wood using non-pressure processes.

Source: Micklewright (1987).

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The American Wood Preservers Institute (AWPI) reported 567 plants that produced preserved wood in 1985 (14 additional wood preserving facilities have recently been identified by AWPI). Approximately 60 percent of these plants are in the southeast and southcentral portions of the United States and account for 64 percent of the production of treated wood. Most plants that treat with creosote and/or pentachlorophenol are more than 25 years old; several operating plants are more than 75 years old.

Most surface protection takes place at sawmills, where cut lumber is dip- or spray-treated to prevent sapstain formation during short-term storage. The distinction between wood preservation and surface protection is not only the process used, but also the depth to which the preservation penetrates and the duration of the protection.

In 1983, lumber production in sawmills was approximately 87 million cubic meters or 36.8 billion board feet (Lumber Production and Mill Stocks, 1983, as cited in DPRA, 1986). Approximately 10 percent of this production, or 8.7 million cubic meters (3.7 billion board feet), was surface protected, the majority with aqueous solutions of sodium pentachlorophenate. The Agency believes that there may be up to 500 sawmills currently surface protecting wood with chlorophenate formulations and a total of 1,500 sawmills that have protected wood with chlorophenates within the past ten years.

1. Wood Preservatives and Surface Protectants

Pentachlorophenol is one of a group of synthetic organic compounds called chlorophenols that are commercially manufactured by reacting chlorine with phenol. Standard petroleum oils, similar to #2 heating oil, are most frequently used as solvents in preparing formulations of pentachlorophenol. Kerosene, mineral spirits, butane, alcohols, and liquefied petroleum gas (LPG) are also used as solvents by a small number of facilities. Pentachlorophenol formulations applied to wood typically contain 5 percent total pentachlorophenol; however, concentrations may range from 2 to 9 percent. Pentachlorophenol has been found to be contaminated with all PCDD and PCDF homologues except tetrachlorodibenzo-*p*-dioxins (TCDDs) (Palmer, 1986 and USEPA, 1987).

Tetrachlorophenol in its water soluble chlorophenate form is often used in sapstain control formulations. Commercial tetrachlorophenol has been found to be contaminated with all ten homologues of polychlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs).

Creosote generically refers to mixtures of relatively heavy residual oils (liquid and solid aromatic hydrocarbons) obtained from the distillation of wood, coal tar, or crude petroleum. Only creosotes from coal tars are accepted for use as wood preservatives. The majority of creosote-based formulations consist of coal tar creosote or blends of creosote and crude coal tar.

The inorganic preservatives of concern in this listing consist of arsenical and chromate salts dissolved in water. The most commonly used inorganic preservatives include chromated copper arsenate (CCA), ammoniacal copper arsenate (ACA), acid copper chromate (ACC), chromated zinc chloride (CZC), and fluor-chrome-arsenate-phenol (FCAP). In a 1984 survey of the wood preserving industry (USEPA, 1987), 83 percent of wood preserved with inorganic preservatives was reportedly preserved with CCA. For treatment purposes, CCA is typically diluted in water to 1 to 2 percent total CCA concentration, but treatment concentrations can range from 0.9 to 8 percent total CCA in various treating solutions (USEPA, 1987).

Production of wood treated with inorganic preservatives has more than doubled since 1980. This increase is due to the increased use of treated lumber for decks, porches, and other exterior, weather-exposed structures. The use of inorganic preservatives, particularly CCA, is increasing; as a result, most new wood preserving plants are CCA plants and facilities that treat exclusively with inorganic preservatives are (on average) only 10 years old.

Water solutions of the sodium or potassium salts of pentachlorophenol (pentachlorophenates) are used extensively in the sawmill industry for surface protection. Chlorophenate formulations are produced by dissolving chlorophenols in a slightly alkaline (above pH 7) sodium hydroxide solution. Commercial chlorophenates have been found to contain PCDDs and PCDFs. Generally, these commercial concentrates are diluted to 0.5 to 1 percent total pentachlorophenate and applied to the wood by dipping or spraying.

An estimated 300 to 500 sawmills use an approximate total of 680 kkg (1.5 million pounds) of sodium pentachlorophenate to prevent sapstaining of approximately 8.7 million cubic meters (3.7 billion board feet) of lumber annually.

2. Wood Preserving and Surface Protection Processes

a. Wood preserving processes. Creosote, pentachlorophenol, and inorganic wood preservatives are all applied to wood by similar processes. More than 99 percent of the wood preserved in the United States is produced by pressure treatment processes, which employ a combination of air pressure, hydrostatic pressure, and vacuum (Micklewright, 1987). Pressure treatment takes place in sealed pressure vessels known as cylinders or retorts. A limited quantity of wood is preserved using non-pressure treatment processes in which the preservative is allowed to diffuse into the wood; typical non-pressure processes involve soaking the wood in open tanks at ambient pressure.

The prerservative penetration required to preserve wood adequately can only be achieved if the wood has been properly conditioned; that is, if the moisture content of the freshly-cut wood is reduced to a point where the preservative can penetrate and be retained by the wood. Conditioning is required before pressure and non-pressure preservation processes, but is not used for surface protection in which a superficial application of preservative is adequate. Conditioning is the major source of wastewater in the wood preserving industry.

Moisture reduction methods include drying wood in yards, at ambient temperatures (air seasoning); kiln drying; steaming the wood at elevated pressure in a retort followed by application of a vacuum; heating the stock in a preservative bath under reduced pressure in a retort (Boulton process); and heating of the unseasoned wood in a solvent under pressure (vapor drying).

Air seasoning and kiln drying generate minimal amounts of wastewater. Thus, facilities that use these conditioning methods, principally non-pressure treaters and facilities that use inorganic preservatives, generate little wastewater. Wastewater from air seasoning and kiln drying is often contaminated with preservative by mixing the wastewater with other wastes later in the process. Boultonizing, steam conditioning, and vapor drying (conditioning methods used by pressure treaters) produce wastewater consisting of the water that is driven out of the wood in the same cylinder or retort that is later used for preserving the wood. Steam conditioning also produces a considerable volume of steam condensate. The volume of wood

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conditioning water varies according to wood type, preservative formulation, conditioning method, and other factors. In general, from 64 to 1,200 liters of water may be generated per cubic meter (0.5 to 9 gallons per cubic foot) of wood (USEPA, 1987).

After the moisture content of the wood has been reduced by conditioning, the wood is preserved either by simple non-pressure methods or by pressure processes. Non-pressure processes include brushing, spraying, dipping, soaking, and thermal processes. These processes involve the repeated use of preservative in a treatment tank with fresh preservative solution added to replace consumptive loss. The continual reuse of preservative leads to the accumulation of wood chips, sand, stones, and other debris contaminated with various hazardous constituents in the bottom of the treating tanks. This contaminated debris is the major source of process waste for non-pressure processes.

There are two basic types of pressure treatment processes, distinguished by the sequence in which vacuum and pressure are applied. The first method is referred to in the industry as the "empty-cell" process. It is used to obtain relatively deep penetration with limited absorption of preservative. There are a number of empty-cell processes; generally, air pressure is applied to the wood as preservative is pumped into the treating cylinder or retort. Once the desired level of retention has been achieved, the unused preservative is drained off and the excess preservative is vacuum pumped away from the wood.

The second method, known as the "full-cell" process, results in higher retention of preservative but limited penetration compared to the empty-cell process. A high vacuum is created in the treating cylinder and preservative is pumped in without breaking the vacuum. Once full, pressure is applied until the wood will retain no more preservative. There is no difference in the types of wastes generated by full- and empty-cell processes, although wood treated by the full-cell process may produce more drippage than wood treated by the empty cell process. (The terms "empty" and "full" are measures of the level of preservative retained by the wood cells.)

Typical pressure processes involve recycling of preservatives from work, storage, and mixing tanks to the pressure treating vessel. Fresh preservative solution is added to replace consumptive loss. Preservative formulation lost with wastewater or through drippage into the door sumps is also sometimes collected and fed back into the process. The continual reuse of preservative formulation leads to accumulation of contaminated sawdust, wood chips, sand, dirt, stones, tar, and polymerized oils. This material comprises the bulk of wood preserving process residuals (not including wastewater) and is collected in treating cylinders and tanks; in holding, work, storage, and mixing tanks; in door sumps; and in filters and separators used to prepare preservative solutions for reuse.

After both pressure and non-pressure treatment, some unabsorbed preservative formulation adheres to the treated wood surface. Eventually, this liquid drips from the wood or is washed off by precipitation. If the wood has been pressure treated, excess preservative will also exude slowly from the wood as it gradually returns to atmospheric pressure (a phenomenon commonly called kick-back). Preservative formulation (especially pentachlorophenol and creosote formulations) may continue to exude ("bleed") from pressure and non-pressure treated wood for long periods, even after the wood is shipped off-site and installed for its intended end use (Arsenault, 1976). Drippage from pressure treated wood may be minimized by steaming the wood after treatment to wash off adhering preservative or by applying a final vacuum to the wood charge before it is removed from the retort.

Management of drippage varies from facility to facility and often depends on the production schedule. A facility producing near its capacity generally removes a charge from the treating cylinder and transfers it to storage quickly. In these cases, most drippage and kick-back will occur in the treated wood storage yard. At facilities operating on slower schedules, a charge may be allowed to drip in the retort for an extended period. Other facilities have drip pads over which trams of freshly-treated wood are allowed to sit for one to three days. Drippage may be routed to a sump and reused in the treatment process or may be discarded.

b. Surface protection processes. The surface protection of wood involves the application by spraying or dipping of sapstain control agents to wood. Spraying can be performed manually or with a continuous conveyor belt system where the wood passes through a spray box. The chlorophenolic spray is often contained by means of flexible brushes or curtains positioned at either end of the box. The boxes may be kept at a negative pressure with an exhaust vent to remove the chorophenolic aerosols. After spraying or dipping, the excess or free liquid is drained from the wood into a catch basin, where it is routed to a screen or filter to remove sawdust and other particles before it is returned to the supply tank for reuse. As the freshly-treated wood is moved from the treatment area to the storage area it continues to drip.

Dip tanks may also be used to apply surface protection chemicals to large bundles of wood or to individual pieces of wood in the production line. The wood can be dipped using transport chains, forklift mechanisms for large jobs, or sequential submerging techniques. Solution used in the dip tanks for sapstain control is occasionally recycled, otherwise it is continually replenished. Recycled solution is pumped through a filter or screening device to remove sawdust and debris before it is returned to the storage/mixing tanks. At smaller-scale facilities, sawdust and other debris simply accumulate on the tank bottom.

C. Description of Wastes

Wastes from wood preserving and surface protection processes consist of wastewaters, process residuals (including discarded preservative) and drippage.

1. Types of Waste Included in Today's Proposed Listing

a. Wastewaters. Wastewaters include wastewater generated from steam conditioning the wood in treatment cylinders prior to applying the preservative. Other sources of wastewater include, but are not limited to, preservative formulation recovery and regeneration wastewater, water used to wash excess preservative from the surface of preserved wood (especially poles), and condensate from drying kilns used to dry preserved or surface protected wood. Operations that involve the rinsing of drums, storage tanks, the process area, and equipment also generate wastewater. Finally, water, including rainwater, that accumulates in door and retort sumps and rainwater falling on or in the immediate vicinity of the treating cylinder and work tank area is also included in the proposed listing. (Storage area rainwater is not included in the listing definition. However, it may become subject to regulation when it is disposed together with drippage covered by the listing). Water from the process area is often collected and treated with other process wastewaters and hence, may become a process waste, subjecting mixtures of rainwater and other wastes or wastewaters to the "mixture" rule (see 40 CFR 261.3(a)(2). Collected

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rainwater is included in the effluent guidelines definition of wood preserving process wastewater. Wastewaters are not already covered under the scope of the K001 listing.

Wastewaters from wood preserving and surface protection processes are currently subject to permitting requirements under the National Pollutant Discharge Elimination System (NPDES) or the national pretreatment regulations, both promulgated under authority of the Clean Water Act, as amended. Upon promulgation of today's proposed listing, wastewaters from wood preserving and surface protection would also be subject to regulation under Subtitle C of RCRA, except as excluded under 40 CFR 261.4.

Section 261.4 provides exemptions from treatment as a RCRA solid waste for several types of materials, including wastes that are mixed with domestic sewage as they pass through a sewer system to a Publicly Owned Treatment Works —POTW— (see 40 CFR 261.4(a)(1)) and wastes that constitute industrial wastewater discharges subject to regulations under section 402 of the Clean Water Act (see 40 CFR 261.4(a)(2)). Wastewaters discharged to sewers and eventually to POTWs by wood preserving and surface protection facilities would therefore be exempt from regulations under Subtitle C of RCRA once discharged. They may be subject to RCRA requirements prior to discharge however, and they would be subject to applicable Clean Water Act pretreatment regulations. Similarly, treated effluent from wastewater treatment plants discharged from NPDES-permitted wood preserving and surface protection facilities would qualify for exemption under § 261.4(a)(2) (but would remain subject to all NPDES permit provisions). The exemption would not extend to activities that occur prior to wastewater discharge at NPDES-permitted facilities. Hence, tanks and other units in which listed wastewaters are collected, stored, accumulated, treated, and/or disposed at wood preserving and surface protection facilities would be subject to regulation under Subtitle C of RCRA. Under 40 CFR 261.4, however, tanks that constitute wastewater treatment tanks (in accoradance with the definition of "wastewater treatment units" of 40 CFR 260.10) are exempt from RCRA Subtitle C requirements.

b. Process residuals. Materials such as sawdust, wood chips, sand, dirt, and stones that are attached to the wood when it enters the retort (in the case of pressurized preservation processes), the dip tank, or the spary booth (for surface protection processes) can be washed off the wood during the process. These materials will form a residue in the retort or dip tank. They may also settle out of the preservative solution elsewhere in the process (e.g., in work tanks or sumps) or be removed during filtration of the preservative prior to its reuse. Tar and emulsified or polymerized oils may also settle out in the treating cylinder, treating tank, or dip tank during wood preserving operations using creosote or pentachlorophenol. All of these wastes are considered process residuals. Specifically, process residuals include, but are not limited to: Precipitated preservative solution; tar; emulsified polymerized oils; spent or discarded formulation; treating cylinder, treating tank, and dip tank sediments; filter, screening, or exhaust residuals from spray booths; hand spraying residuals; residuals from drying kilns used to dry preserved or surface protected wood; residuals from holdings, work, storage, mixing, or other tanks; residuals that accumulate in secondary containment surrounding tanks; door or cylinder sump residuals; residuals from recycling and regeneration of preservative; leaks from process equipment; and residuals from maintenance and cleaning of process equipment. Process residuals are not already covered under the scope of the K001 listing.

c. Drippage and drippage residuals. Drippage and drippage residuals may accumulate on designated drip areas, on pathways over which treated wood is transported, and in treated wood storage yards. Drippage and drippage residuals include free drippage of preservative from treated wood, preservative that is washed off treated wood by precipitation, and residuals from collecting and recycling presevative that drips off or is washed off treated wood. Drippage and drippage residuals are not already covered under the scope of K001 listing.

2. Quantities of Waste Generated

Table 4 presents estimates of the quantities of waste generated annually by wood preserving and surface proctection processes. These estimates were prepared using production normalized waste generation rates and estimates of production of preserved and surface protected wood. The waste generation rates were derived from data collected in the 1984 survey of the wood preserving industry conducted by EPA (USEPA, 1987), from data supplied independently by the industry, and from data collected in a sampling effort carried out jointly by EPA and the State of Oregon at four Oregon sawmills. Production estimates, in terms of preservative used at a given facility, were obtained from the AWPI Wood Preserving statistics report for 1985 (Micklewright, 1987). In addition, the production of surface protected wood was estimated to be 8.7 million cubic meters per year (3.7 billion board feet per year). The assumptions and data used to generate this estimate are provide in detail in the Background Document for this proposed listing.

TABLE 4.—ESTIMATED NATIONWIDE WASTE QUANTITIES (M^3/YR.)

Waste	F032	F033	F034	F035
Wastewater[1]	351,000	[2] 500,000	348,100	([3])
Process Residuals[4]	1,800	600	1,400	400
Drippage and drippage residuals	700	8,700	600	1,900
Total	353,500	9,300	350,100	2,300

[1] Wastewater treatment residuals covered under the K001 listing are not included in these estimates. Wastewaters from process area runoff and from contamination or mixing of nonprocess area runoff with listed wastes also are not included in these estimates.

[2] Surface protection processes do not usually generate process wastewater. Precipitation that falls in the process area is included in the F033 listing. Precipitation that falls in other areas of the facility (e.g., on storage yards) is not included in the F033 listing. However, it may become subject to regulation when mixed with other listed materials such as preservative drippage. Assuming a one-quarter acre process area per plant and 40 inches of rain fall per year, about 1,000 cubic meters per year per plant of surface protection wastewaters, consisting of run-off from process areas, are potentially generated. With 300 to 500 surface protection facilities nationwide, this amounts for 300 to 500,000 m^3/yr of wastewaters.

These wastewaters are often collected in catch basins and sumps and conveyed through ditches and conduits. Sediment and sludges collect in these devices at a rate of approximately 4.84 X 10^{-4} m^3 of material per meter^3 surface-protected wood. Assuming production of 8.7 million m^3/yr of surface-protected wood, 4,200 m^3 of sump, catch basin, and drainage ditch sediments are generated annually.

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[3] Inorganic wood preserving processes typically have no net generation of process wastewater because the water is recycled back to the work tank and is ued in mixing new preservative formulation. The wastewater, if disposed, would contain significant concentrations of the constituents of concern and is included in the proposed listing. The agency was unable to identify any reliable estimates of the quantity of wastewater recycled in inorganic processes annually.

[4] Estimates do not include quantities for spent discarded preservative. EPA anticipates that quantities of preservative discarded or spilled annually are small by comparison to other waste streams. Reliable quantitative estimates are not presently available to EPA.

Source: USEPA, 1987.

The waste estimate for F032 includes wastes from chlorophenolic wood preserving processes, and wastes from creosote, inorganic, and other processes at facilities that treat with chlorophenolics. Wastes from creosote and inorganic processes at facilities that formerly used chlorophenolics are not included in the volume estimates for F032 (they are instead included in either F034 or F035) because current EPA data on preservative use cannot be disaggregated by historical preservative use. To the extent that preservation facilities may have switched from chlorophenolics to other formulations, the total quantity of F032 may be slightly underestimated and the quantities of F034 and F035 overestimated.

An estimated 699,000 cubic meters per year of wastewaters are generated by the wood preserving industry. Further, an estimated, 4,200 cubic meters of process residuals, and 11,900 cubic meters of drippage per year are generated. By comparison, wastewater treatment residuals covered under the K001 listing are generated at a rate of 10,000 cubic meters per year; these are not included in the estimates in Table 4.

3. Waste Management Practices

To support this proposed listing, EPA has compiled information on the waste management practices currently used by the industry. Two principal information sources were used: The 1984 survey conducted by EPA (USEPA, 1987) and a survey conducted by the American Wood Preservers Institute (AWPI) (Lindenheim, 1987). Management practices reported for wastewaters, wastewater treatment residuals, and process residuals are summarized in Table 5. Management practices reported for drippage at wood preserving facilities are summarized in Table 6.

TABLE 5—WASTE MANAGEMENT PRACTICES FOR WASTES PROPOSED FOR LISTING AS REPORTED BY SURVEYED FACILITIES (PERCENT) [1]

Waste management practice	Pentachlorophenol and creosote wastewaters [2] [Percent]	Pentachlorophenol wood preserving process residuals [Percent]	Creosote process residuals [Percent]	Inorganic process residuals [Percent]
Discharged to POTW	63			
Discharged to surface water	3			
Reuse, returned to process	10			
Removed by waste contractor [3]	3	70	63	[4]84
Thermal evaporation in tanks	3			
Storage in surface impoundments	13	7	7	0
Storage in Tanks	0	3	7	5
Burned in boiler/wood burner		3	13	0
Landfill		13	7	7
Reclaimed for reuse				2
Land treatment			3	
Not specified	8	10	3	2

[1] Totals may exceed 100 percent because many facilities reported more than one waste management practice.

[2] Wastewaters from inorganic processes are typically recycled and no other waste management practice data were reported.

[3] Ultimate management practice was not reported but is believed to be principally disposal in landfills.

[4] Includes wastes removed by preservative chemical suppliers.

Source: Background Document.

TABLE 6—MANAGEMENT PRACTICES FOR DRIPPAGE AT WOOD PRESERVING FACILITIES, BY PRESERVATIVE USED

	Pentachlorophenol only and creosote plus pentachlorophenol	Creosote only	Inorganics only	Creosote plus/or pentachlorophenol, plus inorganics
Number of plants surveyed	15	25	82	15
Percent with surfaced drip pad	47	40	91	73
Percent reusing drippage from surfaced drip pad	86	100	91	47
Percent with surfaced storage yard	13	12	38	13
Percent allowing drippage in storage yard directly to ground [1]	87	88	62	87

[1] Calculated by difference (100%—% with surfaced storage yard).

Source: (Lindeheim, 1987).

Sixty-three percent of the 86 facilities surveyed in 1984 by EPA that reported managing wastewater discharged their wastewater to Publicly Owned Treatment Works (POTWs). Typically, they also reported that wastewater

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discharged to POTWs was pretreated by oil/water separation in tanks prior to discharge. Ten percent of the facilities reported using some type of aeration wastewater treatment process and 3 percent reported using both aeration and activated carbon filtration wastewater treatment processes. Thirteen percent of the facilities reported storage or disposal of process wastewater in land-based units (i.e., land treatment units, evaporation ponds, and surface impoundments).

Wood preserving facilities generally manage their process residuals by contracting with a commercial waste removal company for their disposal. Some suppliers of inorganic preservatives also provide this service for their customers. Residuals from pentachlorophenol and creosote treating processes are also managed by storage in surface impoundments or burning on-site in an industrial boiler or wood burner. These practices were not reported for inorganic process residuals.

Forty to 50 percent of the facilities that use pentachlorophenol and/or creosote have a surfaced drip pad, while 91 percent of the facilities that use inorganic preservatives have a surfaced drip pad. This larger fraction is believed to be due to the fact that inorganic plants are generally newer than other wood preserving facilities and are specifically designed for recovery and reuse of preservative drippage. Drip pads are used to route to collection areas or devices, excess preservative that drips from the treated wood when it is removed from the treating cylinder. Facilities that do not have surfaced drip pads generally allow excess preservative to drip directly onto the ground. Most of the facilities that have surfaced drip pads report reusing the collected drippage. AWPI did not report the management practices used by facilities that do not reuse collected drippage.

Only 12 to 13 percent of the facilities treating with pentachlorophenol and/or creosote have surfaced storage pads (i.e., long-term storage yards) while 38 percent of facilities treating with inorganic preservatives have some surfaced storage area. Thus, the Agency concludes that at the remainder of the facilities (about 88 percent of pentachlorophenol and creosote facilities and 62 percent of inorganic facilities), any preservative that drips off stored, treated wood (and any preservative that is washed off by precipitation) is disposed of on the ground.

No survey data were available to describe waste management practices at sawmills that surface-protect wood. Some data, however, were obtained from the facilities sampled by EPA in conjunction with the State of Oregon. Three of the four sawmills sampled by EPA reported their practices for managing process residuals. Two of the facilities contract with a commercial waste disposal company to transport their dip tank sludges and spray booth residuals to a solid waste landfill. The third sawmill reported that its dip tank sludge is burned in an on-site boiler with waste wood. Disposal in on- or off-site landfills, burning in on-site boilers, or incinerating off-site are believed to be common management practices for all surface protection process residuals (presumably, ash from boilers and incinerators is disposed in landfills).

In contrast, spills and releases of surface protection chemicals and drippage and drippage residuals are typically allowed to fall or remain on the ground. Some facilities have installed concrete pads contiguous to the dip tanks and sloping toward sumps that collect drippage. Alternatively, a charge of lumber may be suspended over the dip tank to allow excess preservative to drip back into the tank. However, surface-protected wood is generally stacked over the ground during storage and air seasoning. Thus, the preservative that drips or is washed off the wood is disposed of on the ground.

D. Basis for Listing

1. Summary of Basis for Listing

Each of the four wastes from wood preserving and surface protection processes meet the criteria for listing as hazardous presented in 40 CFR 261.11(a)(3); consequently, EPA is proposing that they be added to the list of hazardous wastes from non-specific sources appearing at 40 CFR 261.31. The wastes contain high concentrations of toxic constituents. (As discussed later, all the constituents of concern are carcinogens and/or systemic toxicants, many of which appear on the list of hazardous waste constituents at 40 CFR Part 261, Appendix VIII. EPA is also proposing to add to Appendix VIII the three compounds that are constituents of concern in wood preserving wastes but do not already appear on Appendix VIII). Tables 7, 8, 9, and 10 list the constituents of concern in wood preserving wastes and the range of levels at which they are present in the wastes. Table 11, 12, 13, and 14 present the average waste concentrations (based on process residual and sludge data, which EPA believes are representative of all the listed wastes) and demonstrate that toxic constituents are present in wastes from wood preserving and surface protection processes at levels that far exceed the health-based levels of concern. From these waste concentrations, hypothetical ground water concentrations resulting from mismanagement of the wastes have been projected assuming three dilution and attenuation scenarios. For all three levels, nearly all constituents of concern exceed established Agency health-based numbers.

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TABLE 7
F032 PENTACHLOROPHENOL WASTES FROM WOOD PRESERVING: CONSTITUENTS OF CONCERN AND RANGE OF DETECTED CONCENTRATIONS

	WASTEWATERS (PPM)	PROCESS SLUDGES OR RESIDUALS (PPM)	PRESERVATIVE FORMULATIONS (DRIPPAGE) (PPM)
Pentachlorophenol	0.01-310	40-34,000	14,000-52,000
Benz(a)anthracene	0.03-10	5.1-2,800	75
Benzo(a)pyrene	0.007-10	54-1,100	50
Dibenz(a,h)anthracene	0.1-1	50-310	7
Indeno(1,2,3-c,d)-pyrene	0.006-10	16-130	4 T
Arsenic	0.003-33	NA	NA
Chromium	0.004-14	NA	NA

	WASTEWATERS (PPB)	PROCESS SLUDGES OR RESIDUALS (PPB)	PRESERVATIVE FORMULATIONS (DRIPPAGE) (PPB)
TCDDs	0.001-8	0.001-5	1
PeCDDs	0.008-20	0.2-2	30-70
HxCDDs	0.03-200	0.06-5,000	100-5,000
HpCDDs	0.009-80	0.5-140,000	9,000-100,000
TCDFs	0.0006-2	0.01-35	1-30
PeCDFs	0.001-300	0.08-1,000	100-1,000
HxCDFs	0.001-10	0.01-13,000	200-10,000
HpCDFs	0.002-50	0.3-16,000	100-13,000

Source: Background Document.

NA - Not Analyzed (No Data Collected).

T - Trace. Analytical data support qualitative analysis (i.e., identification) but not quantitative analysis. Concentration cited is the detection limit of the analytical method used.

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TABLE 8

F033 PENTACHLOROPHENOL WASTES FROM SURFACE PROTECTION: CONSTITUENTS OF CONCERN AND RANGE OF DETECTED CONCENTRATIONS

	SUMP, CATCH BASIN AND DRAINAGE DITCH SEDIMENTS (PPM)	PROCESS SLUDGES OR RESIDUALS (PPM)	PRESERVATIVE FORMULATIONS (DRIPPAGE) (PPM)
Pentachlorophenol[1]	1 - 310	880 - 160,000	40 - 1,900
2,3,4,6-Tetrachlorophenol	0.1 - 130	570 - 4,000	300 - 950
2,4,6-Trichlorophenol	0.1 U	3	0.4 - 1.0

	SUMP, CATCH BASIN AND DRAINAGE DITCH SEDIMENTS (PPB)	PROCESS SLUDGES OR RESIDUALS (PPB)	PRESERVATIVE FORMULATIONS (DRIPPAGE) (PPB)
TCDDs	0.007 - 0.01	6 - 30	0.4 - 3
PeCDDs	0.09 - 0.6	30 - 1,000	1 - 200
HxCDDs	0.2 - 400	400 - 7,000	10 - 10,000
HpCDDs	0.9 - 4,000	2,000 - 42,000	20 - 70,000
TCDFs	0.03 - 70	80 - 4,000	4 - 1,000
PeCDFs	0.07 - 20	400 - 11,000	30 - 8,000
HxCDFs	0.03 - 600	1,000 - 12,000	50 - 28,000
HpCDFs	0.4 - 600	800 - 9,000	4 - 50,000

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[1] In the analysis, a pH adjustment causes all pentachlorophenate to be converted to pentachlorophenol. The analysis measures pentachlorophenol.

[2] Wastewaters from surface protection with pentachlorophenate consist essentially of the used preservative formulation. These data therefore also represent what EPA believes are the constituents and constituent concentrations for wastewaters from surface protection with pentachlorophenate.

Source: Background Document.

U - Compound was analyzed for but not detected. Value listed is the lowest detection limit reported.

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TABLE 9
F034 CREOSOTE WASTES: CONSTITUENTS OF CONCERN AND RANGE OF DETECTED CONCENTRATIONS

	WASTEWATERS (PPM)	PROCESS SLUDGES OR RESIDUALS (PPM)	UNUSED FORMULATION (DRIPPAGE) PPM
Benz(a)anthracene	0.03 - 10	280 - 7,500	1,600 - 2,600
Benzo(a)pyrene	0.007 - 10	1,800 - 3,000	400 - 600
Benz(k)fluoranthene	0.02 - 4	2,300	21,400
Dibenz(a,h)anthracene	0.1 - 1	140 - 680	100 - 400
Indeno(1,2,3-c,d)pyrene	0.006 - 10	100 - 300	1,000
Naphthalene	0.1 - 400	700 - 64,000	13,000 - 180,000
Arsenic	0.003 - 30	NA	NA
Chromium	0.004 - 10	NA	NA

NA - Not analyzed (no data collected).

Source: Background Document.

TABLE 10

F035 INORGANIC WASTES: CONSTITUENTS OF CONCERN AND RANGE OF DETECTED CONCENTRATION

	PROCESS SLUDGES OR RESIDUALS (ppm)	UNUSED PRESERVATIVE[1] (ppm)
Arsenic	5,300 - 760,000	5,500
Chromium	70 - 33,000	6,200
Lead	5 - 290	NR

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[1] Presently, EPA does not have reliable waste characterization data for wastewaters from inorganic processes. The Agency believes that the data for unused preservative are representative of both drippage and process wastewaters from inorganic processes.

NR - Not reported.

Source: Background Document.

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TABLE 11

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F032

HAZARDOUS CONSTITUENT	AVERAGE WASTE CONC. DETECTED[1] (ppm)	HEALTH-BASED WATER CONCENTRATION LIMITS (ppm)	BASIS[2]	ESTIMATED DRINKING WELL CONCENTRATIONS[3] (ppm)			CALCULATED CONCENTRATION TO HEALTH-BASED LIMIT RATIOS[4]		
				DA 100	DA 1,000	DA 10,000	DA 100	DA 1,000	DA 10,000
Benz(a)anthracene	900	1.1×10^{-5}	RSD (Class B_2)	9	0.9	0.09	820,000	82,000	8,200
Benzo(a)pyrene	500	3.0×10^{-6}	RSD (Class B_2)	5	0.5	0.05	1,700,000	170,000	17,000
Dibenzo(a,h)anthracene	200	7.1×10^{-7}	RSD (Class B_2)	2	0.2	0.02	2,800,000	280,000	28,000
Indeno(1,2,3-c,d)pyrene	70	2.0×10^{-3}	RSD (Class C)	0.07	7×10^{-3}	7×10^{-4}	350	35	3.5
Pentachlorophenol[5]	20,000	1	RfD	200	20	2	200	20	2
Arsenic	2,000	0.05	MCL	20	2	0.2	400	40	4
Chromium	3,000	0.05	MCL	30	3	0.3	600	60	6
DIBENZO-P-DIOXINS[6]									
TCDDs	3×10^{-3}	2.3×10^{-8}	RSD (Class B_2)	3×10^{-5}	3×10^{-6}	3×10^{-7}	1,3000	130	13
PeCDDs	1×10^{-3}	4.5×10^{-10}	RSD (Class B_2)	1×10^{-5}	1×10^{-6}	1×10^{-7}	22,000	2,200	220
HXCDDs	2	5.6×10^{-9}	RSD (Class B_2)	0.02	0.002	2×10^{-3}	3,600,000	360,000	36,000
HpCDDs	30	2.3×10^{-7}	RSD (Class B_2)	0.3	0.03	0.003	1,300,000	130,000	13,000
DIBENZOFURANS[6]									
TCDFs	2×10^{-3}	2.3×10^{-8}	RSD (Class B_2)	2×10^{-5}	2×10^{-6}	2×10^{-7}	870	87	9
PeCDFs	0.5	2.3×10^{-9}	RSD (Class B_2)	5×10^{-3}	5×10^{-5}	5×10^{-5}	2,200,000	220,000	22,000
HxCDFs	3	2.3×10^{-8}	RSD (Class B_2)	0.003	3×10^{-3}	3×10^{-4}	1,300,000	130,000	13,000
HpCDFs	4	2.3×10^{-7}	RSD (Class B_2)	0.004	4×10^{-3}	4×10^{-4}	170,000	17,000	1,700

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TABLE 11 (CONCLUDED)

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F032

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[1] Average concentrations calculated from process residuals or process sludge data.

[2] Reference Dose (RfD), Risk Specific Dose (RSD), and Maximum Contaminant Level (MCL) are explained later in the preamble, as are the classes of RSDs. Class A, B, and C carcinogens are based on exposure limits at a 10^{-6} risk level.

[3] Calculated for three dilution/attention (DA) levels.

[4] Ratio obtained by dividing assumed drinking well concentration column by health-based water concentration limit column, for all three dilution/attenuation (DA) levels.

[5] This health-based water concentration limit may change following EPA review of the NTP carcinogen study.

[6] Waste concentrations presented for dioxins and furans are for the total congener category specified (e.g., the concentration indicated for PeCDD is for all isomers of PeCDDs found). The health-based water concentration limit for each congener category is based on extrapolation using toxicity equivalency factors relative to the toxicity of 2,3,7,8-TCDD. (See Risk Assessment Forum, 1986).

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TABLE 12

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F033

HAZARDOUS CONSTITUENT	AVERAGE WASTE CONC. DETECTED[1] (ppm)	HEALTH-BASED WATER CONCENTRATION LIMITS (ppm)	BASIS[2]	ESTIMATED DRINKING WELL CONCENTRATIONS[3] (ppm)			CALCULATED CONCENTRATION TO HEALTH-BASED LIMIT RATIOS[4]		
				DA 100	DA 1,000	DA 10,000	DA 100	DA 1,000	DA 10,000
Pentachlorophenol[5]	20,000	1	RfD	200	20	2	200	20	2
2,4,6-Trichlorophenol	3	1.8×10^{-3}	RSD (Class B2)	0.03	0.003	3×10^{-4}	20	2	0.2
2,3,4,6-Tetrachlorophenol	3,000	1	RfD	30	3	0.3	30	3	0.3
DIBENZO-P-DIOXINS[6]									
TCDDs	2×10^{-2}	2.3×10^{-8}	RSD (Class B_2)	2×10^{-4}	2×10^{-5}	2×10^{-6}	8,700	870	87
PeCDDs	0.3	4.5×10^{-10}	RSD (Class B_2)	0.003	3×10^{-4}	3×10^{-5}	6,700,000	670,000	67,000
HxCDDs	3	5.6×10^{-9}	RSD (Class B_2)	0.03	0.003	3×10^{-4}	5,400,000	540,000	54,000
HpCDDs	20	2.3×10^{-7}	RSD (Class B_2)	0.2	0.02	0.002	870,000	87,000	8,700
DIBENZOFURANS[6]									
TCDFs	1	2.3×10^{-9}	RSD (Class B_2)	0.01	0.001	1×10^{-4}	4,300,000	430,000	43,000
PeCDFs	3	2.3×10^{-9}	RSD (Class B_2)	0.03	0.003	3×10^{-4}	4,300,000	430,000	43,000
HxCDFs	6	2.3×10^{-8}	RSD (Class B_2)	0.06	0.006	6×10^{-4}	2,600,000	260,000	26,000
HpCDFs	3	2.3×10^{-7}	RSD (Class B_2)	0.03	0.003	3×10^{-4}	130,000	13,000	1,300

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[1] Average concentrations based on process sludge or process residual data.

[2] Reference Dose (RfD), Risk Specific Dose (RSD), and Maximum Contaminant Level (MCL) are explained later in the preamble, as are the classes of RSDs. Class B carcinogens are based on exposure limits at a 10^{-6} risk level.

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TABLE 12 (CONCLUDED)

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F033

[3] Calculated for three dilution/attenuation (DA) levels.

[4] Ratio obtained by dividing assumed drinking well concentration column by health-based water concentration limit column for all three dilution/attenuation (DA) levels.

[5] This level health-based water concentration limit may change following EPA review of the NTP carcinogen study.

[6] Waste concentrations presented for dioxins and furans are for the total congener category specified (e.g., the concentration indicated for PeCDDs is for all isomers of PeCDDs found). The health-based water concentration limit for each congener category is based on extrapolation using toxicity equivalency factors relative to the toxicity of 2,3,7,8-TCDD. (See Risk Assessment Forum, 1986).

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TABLE 13

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F034

HAZARDOUS CONSTITUENT	AVERAGE WASTE CONC. DETECTED[1] (ppm)	HEALTH-BASED WATER CONCENTRATION LIMITS (ppm)	BASIS[2]	ESTIMATED DRINKING WELL CONCENTRATIONS[3] (ppm)			CALCULATED CONCENTRATION TO HEALTH-BASED LIMIT RATIOS[4]		
				DA 100	DA 1,000	DA 10,000	DA 100	DA 1,000	DA 10,000
Benz(a)anthracene	4,000	1.1×10^{-5}	RSD (Class B_2)	40	4	0.4	3,600,000	360,000	36,000
Benzo(k)fluoranthene	2,000	4.0×10^{-3}	RSD (Class B_2)	20	2	0.2	5,000	500	50
Benzo(a)pyrene	2,000	3.0×10^{-6}	RSD (Class B_2)	20	2	0.2	6,700,000	670,000	67,000
Dibenz(a,h)anthracene	400	7.1×10^{-7}	RSD (Class B_2)	4	0.4	0.04	5,600,000	560,000	56,000
Indeno(1,2,3-c,d)pyrene	200	2.0×10^{-3}	RSD (Class C)	0.5	0.05	5×10^{-3}	1,000	100	10
Naphthalene	40,000	14	RfD	400	40	4	30	3	0.3
Arsenic	2,000	0.05	MCL	20	2	0.2	40	4	0.4
Chromium	3,000	0.05	MCL	30	3	0.3	60	60	6

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[1] Average concentrations based on process residuals or process sludge data.

[2] Reference Dose (RfD), Risk Specific Dose (RSD), and Maximum Contaminant Level (MCL) are explained later in the preamble, as are the classes of RSDs. Class B and C carcinogens are based on exposure limits at a 10^{-6} risk level.

[3] Calculated for three dilution/attenuation (DA) levels.

[4] Ratio obtained by dividing assumed drinking well concentration column by health-based water concentration limit column for all three dilution/attenuation levels.

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TABLE 14

BASIS FOR LISTING: HEALTH EFFECTS OF THE CONSTITUENTS OF CONCERN IN F035

HAZARDOUS CONSTITUENT	AVERAGE WASTE CONC. DETECTED[1] (ppm)	HEALTH-BASED WATER CONCENTRATION LIMITS (ppm)	BASIS[2]	ESTIMATED DRINKING WELL CONCENTRATIONS[3] (ppm)			CALCULATED CONCENTRATION TO HEALTH-BASED LIMIT RATIOS[4]		
				DA 100	DA 1,000	DA 10,000	DA 100	DA 1,000	DA 10,000
Arsenic	100,000	0.05	MCL	1,000	100	10	2,000	200	20
Chromium	10,000	0.05	MCL	100	10	1	2,000	200	20
Lead[5]	80	0.05	MCL	0.8	0.08	0.008	20	2	0.2

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[1] Concentrations based on process sludge or residual data.

[2] Reference Dose (RfD), Risk Specific Dose (RSD), and Maximum Contaminant Level (MCL) are explained later in the preamble, as are the classes of RSDs.

[3] Calculated for three different dilution/attenuation (DA) levels.

[4] Ratio obtained by dividing assumed drinking well concentration column by health-based water concentration limit column for all three dilution/attenuation (DA) levels.

[5] The MCL for lead is currently undergoing EPA review.

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In the past, EPA's selection of constituents of concern for listed hazardous wastes has relied on comparisons of maximum reported waste constituent concentrations with health-based levels of concern. In this case, the Agency has found, as is shown in Tables 11, 12, 13 and 14, that the concentrations of constituents of concern in wood perserving wastes are so high that even projections of ground water contamination levels based on average waste concentrations (rather than maximum concentrations) exceed health-based levels of concern.

Tables 11, 12, 13, and 14 summarize the Agency's analysis of the hazards posed by the constituents of concern. In this analysis, EPA examined projected ground water concentrations for the constituents of concern assuming three dilution and attenuation factors: 100, 1,000, and 10,000. These three levels encompass a broad range of dilution/attenuation factors. The drinking water well concentrations calculated for dilution/attenuation levels of 100, 1,000, and 10,000 assume that the concentration of each constituent of concern in the well water are 1 percent, 0.1 percent, and 0.01 percent, respectively. The tables show that, in the vast majority of cases, the constituents of concern are likely to appear in ground water at concentrations that exceed the health-based levels of concern by one to four orders of magnitude using the extremely liberal dilution and attenuation factor of 10,000. Thus, even if the Agency did not evaluate the hazard conservatively, these wastes clearly would contain concentrations of constituents of concern far in excess of safe levels.

Damage cases, described below and in an appendix to this preamble, further demonstrate that the constituents of concern in the wastes proposed for listing are sufficiently mobile and persistent for past mismanagement to have resulted in contamination of ground water, surface water, and soils.

After considering all of the factors of 40 CFR 261.11(a)(3), because these wastes contain high concentrations of highly toxic constituents that are mobile and persistent and are unlikely to degrade in the environment before reaching receptors, and because past mismanagement of these wastes has already resulted in serious environmental damage and risk to human health, EPA is proposing that F032, F033, F034, and F035 be added to the list of hazardous wastes from non-specific sources.

2. Waste Characterization and Constituents of Concern

The following section summarizes the information concerning waste characterization and constituents of concern that EPA has gathered to support this proposed listing. EPA has selected constituents of concern based on two principal factors: Their known toxicity and their relevant concentrations in the waste. Other constituents were detected in these waste streams but were not selected as constituents of concern; data on these can be found in the Background Document for today's proposal.

a. Wastes from chlorophenolic wood preserving processes (F032). Table 7 lists the constituents of concern found in wastes from wood preserving operations using chlorophenolic formulations as well as the concentration ranges of these constituents. Pentachlorophenol averaged 15 mg/l in wastewaters with a maximum concentration of 310 mg/l. Twenty-one different polynuclear aromatic hydrocarbon (PAH) compounds (only some of which are constituents of concern) were found in wastewaters from wood preserving operations using pentachlorophenol and/or creosote. The PAH contaminants are believed to be derived from the use of petroleum carrier solvents for the pentachlorophenol formulation and/or the current or past use of creosote wood preserving processes. Arsenic concentrations in wastewaters from facilities that are treated with pentachlorophenol and/or creosote and inorganic preservatives ranged from 0.003 to 33 mg/l, averaging 5 mg/l. Chromium concentrations ranged from 0.004 mg/l to 14 mg/l, averaging 2 mg/l. The Agency believes that pentachlorophenate may be used to preserve wood, although its use is not extensive. Wastes from wood preservation processes that use pentachlorophenate are expected to contain the same chlorophenolic constituents as wastes from pentachlorophenol processes.

The average pentachlorophenol concentration for process sludges was about 1.6 percent. No analyses were available of preservative formulation as it drips from treated wood. Instead, in-use pentachlorophenol wood preserving formulation was sampled to obtain data indicative of constituent concentrations in drippage because EPA believes that drippage either will be or will substantially resemble preserving formulations. The average pentachlorophenol concentration was 26,000 mg/l (2.6%); the maximum concentration was 52,000 mg/l (5.2%). All ten PCDD/PCDF homologue groups were detected in non-wastewater pentachlorophenol treating wastes. However, 2,3,7,8-TCDD was not detected in nine analyzed samples of F032 wastes (process residuals and preservative formulation believed typical of drippage). Total TCDDs were detected in eight of 20 analyzed samples. Calculated equivalent 2,3,7,8-TCDD concentrations for all cogener groups detected averaged 200 ppb for process sludges residuals and 300 ppb for in-use treating solutions.

Within hazardous waste listing F032, the Agency is proposing to include wastes generated at facilities that previously used chlorophenolic formulations and wastes generated from creosote, inorganic, and other processes located within the same facility as a chlorophenol process. Process sludges and wastewater residuals gradually accumulate in wood preserving, surface protection, and wastewater treatment equipment. Periodically (annually, semianually, monthly, or perhaps more frequently, depending on the size and operating practices of the facility) the accumulated residuals are removed from the equipment and then disposed. The Agency has information (which is available in the docket to this rule making) that wood preserving facilities regularly change the preservatives used in a particular piece of process equipment without removing accumulated materials or in any way cleaning the equipment.

EPA has gathered considerable evidence that F032 waste (from inorganic and creosote processes that is either generated from equipment that has been previously used in chlorophenolic processes or generated at facilities that have used or currently use processes on the same site) is contaminated by the constituents of concern from the chlorophenolic processes. Such cross-contamination is documented by the waste characterization data available in the Background Document. These data show that constituents unique to chlorophenolic wastes from chlorophenolic processes were identified in wastes that came from creosote and inorganic processes. The Background Document for this listing presents many cases that describe cross-contamination. The cross-contamination is further documented by information on the wastes and their management practices collected by EPA through site visits and surveys. Based on this information, EPA has concluded that a serious and significant degree of cross-contamination exists due to

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common practices in the industry. EPA has therefore included wastes from inorganic and creosote processes that may be cross-contaminated with chlorophenolic wastes in the F032 listing.

Following are a few examples identified by EPA where cross-contamination as a result of normal operating practices has occurred. More examples are provided in the Background Document.

At a U.S. Army depot in Memphis, Tennessee, wood products were dipped or steeped in a 5,000 gallon vat of pentachlorophenol solution. Treating solution was stored in a ⅜-inch steel underground storage tank which subsequently leaked. After a number of years, the wood treatment process was discontinued and an investigation of the site undertaken. Various surfaces in the treatment area were sampled and analyzed for PCDD and PCDF content. Chips from the treatment building cinderblock walls and concrete floor contained 24.7 ppb and 42.3 ppb of toxic equivalent 2,3,7,8-TCDD, respectively. The storage tank was emptied, cleaned and sandblasted. After sandblasting, a 100 cm^2 wipe of the inside of the storage tank showed 1.3 ppb toxic equivalent 2,3,7,8-TCDD. The tank was hydroblasted and retested. The toxic equivalent 2,3,7,8-TCDD concentration in a 100 cm^2 wipe was then 0.13 ppb. These data demonstrate that process equipment used for preserving wood with pentachlorophenol can be contaminated even after accumulated residuals are removed.

In addition, as part of EPA's general sampling and analysis effort, sediment was collected from a treating cylinder that had been used to treat wood with pentachlorophenol until 2 to 4 months prior to the sampling episode. At that time, the preservative used in the cylinder was replaced with creosote, but the cylinder was not cleaned. The sediment in this wood treating cylinder contained material that had accumulated during pentachlorophenol wood preserving operations and materials that had accumulated during creosote wood preserving operations. Analysis of the sediment showed 140 mg/kg of pentachlorophenol. Pentachlorophenol has never been found as a constituent of creosote or of creosote wood preserving formulations. Cross-contamination must therefore have occurred.

The major cause of cross-contamination at facilities using more than one type of preservative is mixing of the wastes generated from the various processes. Indeed, plants visited by EPA that use more than one type of preservative comingled wastes, and all plants using both creosote and chlorophenolic formulations comingled wastewaters.

One facility surveyed by EPA reported that wastewater from its pentachlorophenol wood preserving operations was routed to an oil-water separator. The oil fraction was returned to the pentachlorophenol work tank while the separated water was used to make up CCA treating solution. In addition, this facility has one vacuum pump used to create a vacuum on both the CCA retort and the pentachlorophenol retort. Cooling and sealing water from the pump was also used to make up CCA treating solution. A second facility reported using the wastewater (after oil/water separation) from its pentachlorophenol treatment operation to make up its ACA treating solution. These practices resulted in cross-contamination of inorganic wood preserving wastes with chlorophenolic, PCDD, and PCDF constituents.

EPA has also obtained reports of other practices leading to cross-contamination of wastes, such as the use of common equipment for moving treated wood, untreated wood, and waste material and the use of common tramcars for holding wood in the treating cylinders. Also, creosote process wastes have become contaminated with chlorophenolic, PCDD, and PCDF constituents at facilities that use a common oil-water separator for chlorophenolic and creosote wastewaters when the recovered oil is recycled back to the creosote process.

Cross-contamination has occurred even when treating cylinders or tanks are dedicated to the application of one preservative formulation. For example, a California wood preserving facility that treated wood with pentachlorophenol and creosote in dedicated retorts measured wastewater contaminant concentrations of pentachlorophenol in the creosote wastewaters of 32 mg/l (Palmer, 1986). This cross-contamination is believed to be the result of using other equipment in common and interconnecting piping. Thus, cross-contamination may occur at facilities that attempt to segregate chlorophenolic from non-chlorophenolic wastes if the processes, process equipment, and process areas are not adequately segregated.

The Agency's principal concern regarding cross-contamination is that it may result in wastes from creosote and inorganic processes containing dioxins and dibenzofurans that are not normally present in wastes generated by these processes. EPA recognizes that the presence of dioxin contaminants in a hazardous waste may reduce the availability of hazardous waste treatment, storage, or disposal facilities that can or will accept the waste.

Since cross-contamination can be eliminated through proper cleaning and replacement of contamination equipment, today's proposal includes standards for equipment cleaning and replacement. Generators of F032 who change to another preservative and who comply with the equipment cleaning and replacement standards will generate wastes that do not meet the F032 listing once cleaning and replacement is complete and provided that the generator does not resume using chlorophenolic formulations. Generators should note that after successful cleaning and replacement, their wastes may continue to be subject to regulation under Subtitle C of RCRA either because they meet the listing descriptions of F034 or F035 or because they exhibit one or more of the characteristics of hazardous waste. The equipment cleaning and replacement standards are discussed in detail elsewhere in this preamble.

b. Wastes from chlorophenolic surface protection processes (F033). Table 8 lists the constituents of concern found in wastes from surface protection operations using chlorophenates as well as the concentration ranges of these constituents. Although no wastewater is directly generated from surface protection processes, precipitation that comes into contact with process areas can become contaminated with surface protection chemicals. This contaminated precipitation is collected in sumps and catch basins and may be conveyed back to the process, to wastewater treatment (or, more commonly, to offsite discharge via natural drainage or earthen ditches).

No information quantifying the amount of wastewater generated at surface protection facilities was collected by the agency during its study of the industry. The quantity of precipitation falling on the process area at a surface protection facility is estimated to be approximately 1,000,000 liters (270,000 gallons) per year, assuming an annual rainfall of 100 cm (40 inches) and a process area of 1,000 m^2 (0.25 acre). For 300 to 500 surface protection facilities, this amounts to 300 to 500 million liters (80 to 130 million gallons) per year.

Limited data were available to characterize the concentration of constituents of concern in surface protection wastewater. One sample of water taken from a drain near a dip tank contained 14 ppm tetrachlorophenols

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and 6 ppm pentachlorophenol. At another facility, a sample of wastewater collected from a ditch which drained the dip tank area to a creek contained 0.3 ppm pentachlorophenol. The complete data set, including all constituents detected, can be found in Appendix D of the Background Document.

In process sludges or residuals (such as working tank or retort sediments), the concentration of pentachlorophenol averaged 20,000 mg/kg, (2.0 percent). Tetrachlorophenols are present in the preservative formulation, either as the active ingredient or a contaminant of pentachlorophenates. The average total isomer tetrachlorophenol concentration was 17,000 mg/kg (1.7 percent).

The pentachlorophenol concentration in sludges that accumulate in catch basins, sumps, and drainage ditches averaged 95 mg/kg while the concentration of 2,3,4,6-tetrachlorophenol averaged 40 mg/kg. No analyses of preservative formulation as it drips from surface-protected wood were available. Instead, in-use chlorophenate surface protection formulation was sampled to obtain data representative of constituent concentrations in drippage. Wastewater from surface protection processes consists principally of used preservative formulation (i.e., the formulation in the dip tank). EPA, therefore, believes that in-use chlorophenate surface protection characterization data are also representative of wastewaters from surface protection with chlorophenate formulations. The average pentachlorophenol concentration was 810 mg/l with an average 2,3,4,6-tetrachlorophenol concentration of 520 mg/l.

All ten PCDD/PCDF homologue groups, including 2,3,7,8–TCDD, were detected in surface protection wastes. 2,3,7,8–TCDD was detected in 3 of 15 samples of F033 wastes analyzed for 2,3,7,8–TCDD (catch basin and drainage ditch sediments, process residuals and preservative formulation). Total TCDDs (including 2,3,7,8–TCDD and all other homologues) were detected in 7 of 16 samples of F033 wastes analyzed for TCDDs. The average 2,3,7,8–TCDD concentration in process sludges was 8 ug/1 (ppb). The 2,3,7,8–TCDD concentration measured in one sample of sediment from a surface drainage ditch was 7 ppt. Total equivalent 2,3,7,8–TCDD concentrations were also calculated from sampling data for the various types of surface protection wastes. The equivalent concentration averaged 700 ppb for process sludges or residuals, 4 ppb for sludges that accumulate in sumps and catch basins and 700 ppb for in-use surface protection solutions. The sampling data and Toxicity Equivalent Factors used to calculate these averages from sampling data are provided in the Background Document.

The Agency anticipates that as a result of today's proposed listings, many sawmills that generate no hazardous waste except the residuals from chlorophenolic surface protection processes will change preservative formulations to avoid becoming hazardous waste generators.

Generators of F033 wastes should note that the listing includes cross-contaminated wastes, similar to the F032 listing. Therefore, although a generator may change preservatives to one that has not been evaluated as part of this listing, the wastes from the new preservative would continue to be F033 wastes due to the potential for cross-contamination. As for F032 cross-contaminated wastes, in order to provide generators who are able to change preservatives with an opportunity to eliminate the potential for cross-contamination and hence, to have their wastes generated from processes using non-chlorophenolic formulations no longer be F033 waste, EPA is proposing standards for equipment cleaning and replacement as part of today's proposed rule. Generators who change to another preservative (that is, one not subject to the listing) and who comply with the equipment cleaning and replacement standards will generate wastes in these processes that are not F033-listed waste. Generators should note, however, that their wastes will remain subject to the hazardous waste characteristic rules and, should they exhibit one or more characteristics of hazardous waste, would continue to be subject to regulation under Subtitle C of RCRA. The Agency notes also that the equipment cleaning and replacement standard does not in any way affect any future listing determinations that EPA may make regarding other surface protection formulations not covered by today's listing. Should the agency promulgate a listing for such other preservatives in the future, wastes generated, although in compliance with the equipment cleaning and replacement standard could again be subject to Subtitle C regulations.

c. Wastes from creosote wood preserving processes (F034). Table 9 lists the constituents of concern found in wastes from wood preserving operations using creosote as well as the concentration ranges of these constituents. Pentachlorophenol, PCDDs, and PCDFs derive solely from wood preserving operations using chlorophenolics and are not present in wastes at facilities that have never used chlorophenolic formulations. Twenty-five different PAH compounds (not all of which are defined as constituents of concern) were found in wastewaters from wood preserving operations using creosote. Naphthalene, the most frequently detected compound, averaged 56 mg/1 in wastewaters. Phenanthrene, also frequently detected, averaged 54,000 mg/kg (5.4 percent), in process sludges or residuals.

No analyses of creosote preservative formulations were available, either as they drip from treated wood or as in-use formulations. However, initial free drippage from creosote-treated wood is expected to have the same composition as unused creosote formulations (mixtures of creosote and coal tar). Literature data on creosote formulations, presented in the Background Document for today's proposal, were available for eleven PAH compounds with phenanthrene at 180,000 mg/kg (18 percent) present at the highest concentration.

Toxic metals concentrations in wastes from creosote processes are variable and depend on the extent of cross-contamination at a particular facility. Data describing the extent of cross-contamination between creosote and inorganic processes are provided in the Background Document developed in support of this proposed listing.

d. Wastes from inorganic wood preserving processes (F035). Table 10 lists the constituents of concern found in wastes from wood preserving processes using only inorganic formulations of arsenic and chromium. It also lists the concentration ranges of these metals in the wastes. Arsenic concentrations in process residuals averaged 150,000 mg/kg (15 percent); chromium concentrations averaged 14,000 mg/kg (1.4 percent). Lead was also present in samples of process sludges, at an average concentration of 80 mg/kg. Lead found in wood preserving wastes is believed to be a contaminant of the arsenic component of the preservative formulation. This listing applies only to wastes from facilities that presently use inorganic preservatives and are not using or have not previously used chlorophenolic preservatives as previously discussed (those wastes from inorganic facilities where chlorophenolics have been used are covered under the proposed F032 listing). Consequently, the constituents of concern for F035 do not include pentachorophenol, PCDDs, or PCDFs. PAH compounds derive from creosote

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and from petroleum oils used as pentachlorophenol carriers and may be present in residuals from inorganic treating facilities that have always previously used creosote preservatives or are presently using both inorganics and creosote preservatives on the same site.

Information available to EPA indicates that wastewaters from arsenical or chromium wood preserving processes are typically recycled. These wastewaters are proposed to be listed as hazardous waste and will be subject to regulation when they are not recycled (See generally, the Solid Waste Redefinition Rule, 50 FR 663, January 4, 1985).

No analyses of inorganic preservative formulations, either as they drip from treated wood or as in-use formulations, were available. However, initial drippage from wood treated with inorganic preservatives is expected to have the same composition as unused preservative solution, as specified by the American Wood Preservers Association. A 2.5 percent solution of CCA-C, the most commonly used inorganic preservative, has approximately 5,500 mg/1 arsenic and 6,200 mg/1 chromium. Data supporting these concentration estimates are provided in the Background Document developed to support this proposed listing.

3. Health Effects of Concern

The Agency has obtained data demonstrating that the constituents found in the wastes generated by the preservation and surface protection of wood with chlorophenolics, creosote, and inorganic formulations are systemic toxicants and/or carcinogens. These toxic constituents are present in concentrations capable of causing adverse health effects as shown by Tables 11, 12, 13 and 14. The tables demonstrate that even if only 0.01 percent of the average constituent levels in the waste reaches environmental receptors, the exposure concentrations are often four orders of magnitude higher than the health-based levels of concern. If the Agency assumes more conservative dilution and attenuation factors (projecting that a larger portion of the waste disposed would reach environmental receptors) the exposure concentrations would be even higher. Given such high concentrations in the waste, the potential for exposure to harmful concentrations of the constituents of concern is extremely high.

For the purpose of listing waste as hazardous under RCRA, the Agency routinely uses three basic methods to indicate measures of toxicity: (1) Maximum Contaminant Levels (MCLs); (2) Risk Specific Doses (RSDs) for known carcinogens; and (3) Reference Doses (RfDs) for systemic toxicants. Based on different criteria, each of these methods give the maximum doses or levels of exposure that are acceptable.

MCLs are final Drinking Water Standards promulgated under Section 1412 of the Safe Drinking Water Act of 1974, as amended in 1984, for both carcinogenic and non-carcinogenic compounds. In setting MCLs, EPA considers a range of pertinent factors (for example, see 52 FR 25697-98, July 8, 1987).

For many carcinogenic constituents for which MCLs are not promulgated, the Agency has developed oral RSDs. The RSD is a dose that corresponds to a specified level of risk of an individual contracting cancer over a 70-year lifetime because of the presence of the toxicant in drinking water. To develop an RSD, a risk level must be specified. EPA specifies the risk level of concern on a weight-of-evidence scheme based on the quality and adequacy of experimental data and the kinds of responses induced by a suspect carcinogen. The carcinogenic constituents of concern in F032, F033, F034, and F035 for which no MCLs exist are either probable human carcinogens (Class B_2), based on a combination of sufficient evidence in animals and inadequate data in humans, or possible human carcinogens (Class C), based on limited animal evidence in the absence of human data. (Details on the other classes of carcinogens are given in the Background Document.) The oral RSDs for carcinogenic agents are presented at the 10^{-6} risk level for Class A and B carcinogens and the 10^{-5} risk level for Class C carcinogens. This is consistent with the risk levels used to delist specific wastes.

Oral Reference Dose Numbers (RfDs) are established for non-carcinogenic constituents. An RfD is an estimate of a daily exposure to a substance for the human population (including sensitive subgroups) that appears to be without an appreciable risk of deleterious effects during a lifetime. If frequent exposures that exceed the RfD occur, the probability that adverse effects may be observed increases. The method for estimating the RfD for non-carcinogenic end points was described in the proposed rule for the Toxicity Characteristic (51 FR 21648, June 13, 1986).

The hazardous constituents of concern have carcinogenic or other chronic systemic effects on laboratory animals or humans and have been determined to be present in the wastes from wood preserving and surface protection processes in sufficient concentrations to pose a substantial threat to human health and the environment. As outlined here, EPA has established RfDs, RSDs, or MCLs for all of the constituents of concern in wood preserving wastes. A brief summary of the toxicity of these constituents is presented in this preamble. A more detailed discussion is included in the Background Document to today's proposal.

The concentration limits for the constituents of concern in Tables 11, 12, 13, and 14 are based on two assumptions. First, that the average person has a mass of 70 kg and, second, that a person drinks, on average, 2 liters of water daily.

All the chlorophenols of concern (see Table 1) for F032, F033, and F034 are chronic systemic toxicants. One of them 2,4,6-trichlorophenol is also a Class B_2 carcinogen (based on animal toxicity data) with an RSD of 1.8×10^{-3} ppm; it has caused lymphomas, leukemias, and carcinomas in rats and mice, and has been determined to be mutagenic.

2,3,4,6-tetrachlorophenol is a systemic toxicant and has been assigned an RfD of 1 ppm. This is supported by subchronic oral and reproductive studies in animals; significant biochemical and clinical pathological changes have been reported.

Previous studies of pentachlorophenol have shown it to be highly toxic to humans. Based on available data, EPA has established an RfD for pentachlorophenol of 1 ppm. Pentachlorophenol causes contact dermatitis, damage to vision, and, on ingestion, lung, liver, and kidney damage. Inhalation of pentachlorophenol results in acute poisoning, centering on the circulatory system with accompanying heart failure. Oral doses of 29 ppm have been reported to be lethal to humans. Data from a recent National Toxicology Program bioassay, (McConnell, 1988), however, provide evidence that pentachlorophenol is also a carcinogen.[2]

The polynuclear aromatic hydrocarbon constituents of concern in F032, F033, and F034 (see Table 1) are all chronic systemic toxicants; some are also carcinogenic. Naphthalene has an RfD of 14 ppm, pyrene an RfD of 4 ppm,

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[2] The NTP bioassay would change the previously established health-based number of 1 ppm for pentachlorophenol. The final rule may be revised following Office of Solid Waste's review of the study.

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and benzo(k)fluoranthene an RfD of 0.004 ppm.

Benz(a)anthracene is a Class B_2 carcinogen; various studies on mice have resulted in sarcomas, bladder carcinomas, and malignant skin tumors. The RSD, by ingestion, at the 10^{-6} risk level, is 1.1×10^{-5} ppm.

Benzo(a)pyrene is also a Class B_2 carcinogen; its RSD, by ingestion, at the 10^{-6} risk-level, is 3×10^{-6} ppm in drinking water. In animals, it has caused stomach, skin, and lung tumors, lung adenomas, and local tumors following direct injection. In humans, clear association between exposure and occurrence of lung cancer has been shown for several mixtures containing benzo(a)pyrene. Skin exposure has resulted in benign and reversible skin lesions.

Dibenz(a,h)anthracene is also a Class B_2 carcinogen. Its RSD, by ingestion, at the 10^{-} risk level is 7×10^{-7} ppm. Via various routes of exposure, dibenz(a,h)anthracene has increased the occurrence in mice of lung, skin, and mammary carcinomas, subcutaneous sarcomas, pulmonary adenomas, and hemangioendotheliomas. Indeno(1,2,3-cd)pyrene is a Class C carcinogen; it has an RSD of 0.002 ppm. Specifically, skin carcinomas and papillomas in mice have resulted from subcutaneous injection of and skin painting with indeno(1,2,3-cd)pyrene.

Each of the inorganic constituents of concern in F032,, F033, F034, and F035 (arsenic, chromium, and lead) has an MCL of 0.05 ppm. Arsenic is a proven carcinogen (Class A), has caused skin and lung cancer in humans and, through occupational exposure, may cause precancerous lesions. Chromium compounds are acute systemic toxicants, mainly affecting the skin and mucous membranes. Lead is an accumulative poison; it can cause a number of human physiological effects including kidney damage and reproductive disorders. (The MCL for lead is currently being reviewed by the Agency.)

To date, EPA has established health-based numbers for only two of the PCDD constituents of concern: 2,3,7,8-tetrachlorodibenzo-*p*-dioxin and hexachlorodibenzodioxin. Only limited data exist on the other congeners. These congeners differ in the number of chlorine atoms they contain and the relative positions of these chlorine atoms on the dioxin or furan molecules. The similarity in structure that some of these congeners display indicates that they are often present together as a complex mixture. The congener 2,3,7,8-TCDD is the most widely studied constituent of concern. It is a Class B_2 carcinogen, its RSD, at the 10^{-6} risk level, corresponds to a water concentration limit of 2.3×10^{-10} ppm. Exceptionally low doses of this compound elicit a wide range of toxic responses in animals (e.g., adverse reproductive effects, thymic atrophy, and a wasting syndrome leading to death).

For those PCDD congeners and PCDFs that do not have established RSDs, EPA is proposing to use the health-based numbers for 2,3,7,8-TCDD as an indicator of their relative toxicity. This is determined by using the toxicity equivalence factors (TEFs) assigned to the relevant congener and applied to risk levels associated with 2,3,7,8-TCDD. Limited data suggest that other PCDD congeners have toxic effects similar to those of 2,3,7,8-TCDD. Further, data indicate that some PCDF congeners exhibit 2,3,7,8-TCDD-like toxicity.

Briefly, to determine TEFs, concentration data are first obtained on the PCDDs and PCDFs present in the mixture. Then, reasoning on the basis of the structure-activity relations and results of short-term tests, the toxicity of each of the components is estimated and expressed as an equivalent amount of 2,3,7,8-TCDD. Combined with estimates of exposure and known toxicity information on 2,3,7,8-TCDD, the risks associated with the mixture of PCDDs and PCDFs can be assessed. The Agency believes that, in the absence of toxicological data on all the PCDDs and PCDFs and, as an interim measure, this method provides a reasonable estimate of the toxicity (see Risk Assessment Forum, 1986).

4. Constituents Proposed for Addition to Appendix VIII

The majority of the constituents of concern present in the wood preserving and surface protection wastes already appear on the list of hazardous constituents (409 CFR Part 261, Appendix VIII). This action proposes to add three more constituents of concern from such wastes which are not presently listed on Appendix VIII to that appendix, specifically: benzo(k)-fluoranthene, heptachlorodibenzofurans, and heptachlorodibenzo-*p*-dioxins. The known health effects of these waste constituents are summarized in the following discussion.

Benzo(k)fluoranthene is classified by EPA as a Class B_2 carcinogen. Available toxicity data (USEPA, 1987) demonstrate that it is carcinogenic to animals and, according to the International Agency for Research on Cancer (IARC), benzo(k)fluoranthene is a probable human carcinogen. Benzo(k)fluoranthene has been evaluated in dermal studies with mice, in mouse-skin initiation-promotion assays using TPA as a promoter, and in a subcutaneous injection study of mice. It has been shown to be active as an initiator and produced injection site sarcomas in the subcutaneous study. Benzo(k)fluoranthene has also been shown to be mutagenic in standard mutagenicity tests with *Salmonella typhimurium* strains TA100 and TA98.

Heptachlorodibenzo-*p*-dioxins and heptachlorodibenzofurans are members of the large family of chlorinated dioxins and furans. Certain of these chemicals, most notably, 2,3,7,8-TCDD, have been shown to be highly toxic. The Agency's Carcinogen Assessment Group (CAG) has completed quantitative analyses demonstrating that 2,3,7,8-TCDDs and 2,3,7,8-HxCDDs are among the most potent animal carcinogens ever evaluated by the Agency. Limited experimental data, supplemented by structure/activity analyses indicate other chlorinated dioxins and furans, such as heptachlorodibenzo-*p*-dioxin and heptachlorodibenzofuran may have toxic effects similar to 2,3,7,8-TCDD at very low doses (EPA, 1987). EPA has therefore concluded that there is sufficient evidence to conclude that heptachlorodibenzo-*p*-dioxin and heptachlorodibenzo-furan are constituents of concern in hazardous wastes and should be added to 40 CFR 261 Appendix VIII.

5. Mobility and Persistence of Wastes from Wood Preserving and Surface Protection Processes

The toxic constituents from wood preserving and surface protection processes have been found to migrate from the wastes and, further, they have been found to have sufficient mobility and persistence in the environment to contaminate ground water (including drinking water), surface waters and sediments, and surface soils. The solubilities and projected ground water mobility of the selected organic constituents of wood preserving wastes are presented in Table 15.

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TABLE 15.—GROUNDWATER MOBILITY AND PERSISTENCE OF CONSTITUENTS OF CONCERN

Constituents of concern	Water solubility (ppm)	Log [1] K_{ow}	K_{oc}[2]	Mobility [3]		Persistence [3]
				Slightly [4] contaminated medium	Highly [5] contaminated medium	
CHLOROPHENOLS						
2,4,6-Trichlorophenol	800	3.61	2,000	low	high	high.
2,3,4,6-Tetrachlorophenol	—	4.1	4,050	low	high	high.
Pentachlorophenol [6]	14	5.04	16,000	low	high	high.
POLYNUCLEAR AROMATIC HYDROCARBONS						
Benz(a)anthracene	0.057	5.61	20,000	low	high	high.
Benzo(a)pyrene	0.038	6.06	550,000	low	high	high.
Benzo(k)fluoranthene	0.0043	6.06	550,000	low	high	high.
Dibenz(a,h)anthracene	0.0005	6.84	3,300,000	low	high	high.
Indeno(1,2,3-c,d)pyrene	0.0005	6.50	1,600,000	low	high	high.
Naphthalene	31.7	3.29	940	low	high	high.
POLYCHLORINATED DIBENZO-*P*-DIOXINS AND DIBENZOFURANS						
Tetrachlorodibenzo-*p*-dioxins [7]	0.0002	6.84	3,300,000	low	high	high.
Pentachlorodibenzo-*p*-dioxins [8]	0.0001	9.65	1,700,000	low	high	high.
Hexachlorodibenzo-*p*-dioxins [9]	0.000004	10.44	11,500,000	low	high	high.
Heptachlorodibenzo-*p*-dioxins [10]	0.000002	11.50	17,000,000	low	high	high.

[1] K_{ow} = Octanol-water partition coefficient; See Background Document for Data Sources.

[2] K_{oc} = Soil sorption coefficient. See Background Document for Data Sources.

[3] Qualitative relative evaluation of mobility and persistence, based on water solubility, log K_{ow}, and K_{oc}.

[4] Slightly contaminated medium represents a mismanagement scenario where release of hazardous constituents does not result in saturation of the underlying soil by organic hazardous constituents.

[5] Highly contaminated medium represents a mismanagement scenario where release of hazardous constituents results in saturation of the underlying soil by organic hazardous constituents.

[6] Solubility of pentachlorophenol is dependent on pH. Value indicated represents a pH of 4.74.

[7] Data based on properties of 2,3,8,7-Tetrachlorodibenzo-*p*-dioxin.

[8] Data based on properties of 1,2,3,4,7-Pentachlorodibenzo-*p*-dioxin.

[9] Data based on properties of 1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin.

[10] Data based on properties of 1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin.

Source: Background Document.

The subsurface transport of toxic constituents from their disposal site through the unsaturated soil zone to, and then within, ground water may take place by several mechanisms. The toxicants may exist as water soluble substances that are transported by advection (i.e., with the moving water phase), the least complex transport mechanism. Such aqueous-phase transport is believed to be the predominant mechanism for the metal constituents of wood preserving wastes.

A second mechanism for the transport of wood preserving wastes is migration in a discrete oil (or other nonaqueous solvent) phase. Subsurface investigations at many of the sites described in the damage cases (found in the docket supporting this listing) have revealed the presence of a discrete oil or creosote phase. These phases may exist as oil sludges, lenses, or a floating oil layer on the water table. Because the oil and creosote differ from ground water in their chemical and physical properties, including density, these nonaqueous phases may migrate in the subsurface independent of ground water flow. For example, dense materials will tend to migrate vertically through an aquifer until buoyancy is achieved or a vertical barrier is encountered. These materials may also migrate laterally faster or slower than the rate of ground water flow because of the effects of differing chemical and physical properties on attenuation mechanisms.

Investigations of many wood preserving facilities have revealed that toxic organic constituents of wood preserving wastes are present in ground water at concentrations that far exceed their solubility. For example, in seven out of eight measurements of heptachlorodibenzo-*p*-dioxins (HpCDDs) in ground water from three different facilities, the measured HpCDD concentration exceeded its reported solubility (0.002 ppb) by many orders of magnitude. The HpCDD concentration at one site was 4.2 ppb; at a second site, ground water collected at a depth interval of 62 to 155 feet below the surface contained 2.6 ppb of HpCCD.

The reported solubility of pentachlorophenol is 14 ppm. Ground water samples from five sites contained over 20 ppm of pentachlorophenol. The concentration at one site was 210 ppm. Although exact reasons for these phenomena are not fully understood, they are believed primarily to result from the oily nature of these wastes and solvent-assisted transport.

Creosote constituents have also been measured in ground water at concentrations above their solubilities. At one site, benz(a)anthracene and benzo(a)pyrene were all measured at concentrations about ten times their reported solubility (measured concentrations were 0.35 and 0.08 ppm, respectively). Again, this is believed primarily to be due to the oily nature of these wastes.

It should be stressed that these ground water samples did not contain a separate oil phase (contaminant concentrations in subsurface oil phases are, in general, much higher than those described above.) Clearly, the distinct aqueous phase and oil phase transport mechanisms do not fully explain the migration of toxic constituents of organic wood preserving wastes. The actual mechanism or mechanisms at work are not fully understood; hypotheses include transport of the organics as oil micelles (microdroplets) or emulsions suspended in water, transport of the organics sorbed onto humic acids or colloidal solids which are suspended in ground water, pH effects, and cosolvent effects, perhaps from lignins and terpenes that leach from wood during treatment. Although the exact transport mechanisms have not been fully elucidated, it is clear from available data that the toxic constituents in wood preserving wastes are highly mobile and can therefore

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reach environmental receptors at hazardous concentrations.

The mobility parameters summarized in Table 15 distinguish between low- and high-contaminated soil medium. At low contamination levels, leaching of water soluble constituents from the waste to the ground water predominates with less water soluble constituents being adsorbed by the surrounding soil, or migrating through other less well-understood mechanisms. However, as the contamination level of the soil medium increases, the soil becomes saturated, eliminating further adsorption of the non-polar constituents and creating a separate organic phase. This organic phase dissolves the non-polar constituents and facilitates transport from the site.

The Agency considers a compound to be persistent if it persists in the environment long enough to be detected since, if a chemical can be detected in ground water, exposure to humans is possible. All the constituents of concern in waste streams, F032, F033, F034, F035 are adequately persistent to result in human exposure if they are released into ground water. The principal processes that limit the persistence (half-life) of chemicals in ground water are hydroloysis and biodegradation. None of the constituents are expected to hydrolyze in water between pH 2 and 12 at ambient temperature at a rate fast enough to be a factor in limiting human exposure. This is because none of the constituents of concern have structural components that would be expected to react with water under those conditions.

Biodegradation is probably the most important degradation mechanism for each of the organic constituents of concern. Under certain aerobic conditions (i.e., condition in which oxidizing microorganisms are capable of metabolism), organic hazardous constituents are expected to be biodegradable as shown under controlled laboratory conditions. Little is known, however, about the degradation of these compounds in the real world or in anaerobic environments. Under anaerobic conditions (i.e., those in which microorganisms capable only of oxidative metabolism, cannot survive), these compounds may persist for very long periods. In ground water therefore, where microbial life and oxygen are limited, to biodegradation of these constituents is expected to be slow or non-existent.

To substantiate the mobility and persistance of these compounds, over 100 cases of environmental contamination with wood preserving and surface protection wastes are described in the docket supporting this proposed rulemaking. Selected cases describing environmental contamination with pentachlorophenol, creosote, and inorganic wood preserving wastes and pentachlorophenate surface protection wastes are presented in an appendix to this preamble.

E. Basis for Designating F032 and F033 As Toxic (T) Rather Than Acute Hazardous (H)

EPA has previously listed wastes from the manufacture of pentachlorophenol—namely, F021 (wastes from the production or manfacturing use of pentachlorophenol, or of intermediates used to produce its derivatives) and F027 (discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols)—as acute hazardous waste. EPA promulgated the listing for F021 and F027 on January 14, 1985 (see 50 FR 1978), as part of an action that involved listing seven different acute dioxin-containing wastes.

Today's action proposes to designate wastes from wood preserving and surface protection processes that use or may be contaminated with pentachlorophenol (F032 and F033, repectively) as toxic (T) rather than as acute hazardous (H) waste. EPA's decision to designate F032 and F033 as toxic is based primarily on new information regarding the toxicity of commerical pentachlorophenol products contaminated with concentrations of hexachlorodizbenzodioxin (HxCDD). This new information also may affect the Agency's basis for designating F021 and F027 as acute hazardous. Consequently, EPA may, in the future, consider changing the designation of F021 and F027 from acute hazardous to toxic. Any such action would be the subject of a separate rulemaking in the future. The agency is not soliciting comments on the basis for, or listing of, hazardous wastes F020 through F023, or F026 through F028 as part of this proposal, and will not respond to any comments received regarding these listings.

In the preamble that accompanied the January 14, 1985 rule, the Agency stated that "The principal basis for listing the pentachlorophenol wastes as acute hazardous is the presence of substantial concentrations of HxCDDs and HxCDFs (hexachlorodibenzofurans) * * *" (50 FR 1980). On the basis of the toxicity data available at the time of promulgation (i.e., that HxCDDs are about 4 percent as toxic as tetrachlorodibenzodioxins (TCDDs), equal in potency to Aflatoxin B1, and 1,000 times more potent than ethylene dibromide), EPA concluded that HxCDD is one of the most potent carcinogens ever identified by the Agency. The Agency concluded therefore, that "* * * because these wastes contain the potent carcinogen HxCDD at levels of regulatory concern, they meet the criteria of 40 CFR 261.11(a)(2), and are properly listed as acute hazardous wastes * * *" (50 FR 1982). In making this finding, the Agency relied on toxicity data for HxCDD, provided by a bioassay conducted by the National Cancer Institute in 1983 as a surrogate for the toxicity of mixtures of pentachlorophenol and HxCDD found in pentachlorophenol wastes.

In April of this year, the National Toxicology Program (NTP) released a draft report on the results of a study of the toxicity of purified and technical grade pentachlorophenol containing measured levels of HxCDD as well as other dioxin homologues in lower concentrations (McConnell, 1988). EPA's Carcinogen Assessment Group (CAG) has reviewed the NTP report, found the study to be valid according to its established criteria, and concluded that the data from the study are valid for use in calculating $Q1^*$ values for the mixtures studied.

The NTP draft report states that the purified pentachlorophenol tested was DOW EC-7 which contained 0.19 ppm HxCDD. The technical grade pentachlorophenol tested was a composite mixture of equal parts of products made by Monsanto, Reichhold, and Vulcan; it contained 10.1 ppm. HxCDD. The DOW EC-7 was also reported to contain tetrachlorodibenzodioxin at greater than 0.04 ppm, heptachlorodibenzodioxin at 0.53 ppm, octachlorodibenzodioxin at 0.69 ppm, heptachlorodibenzofuran at 0.13 ppm, and octachlorodibenzofuran at 0.15 ppm. NTP reported that the technical grade mixture contained the following additional dioxins and furans: Heptachlorodibenzodioxin at 296 ppm, octachlorodibenzodioxin at 1,386 ppm, pentachlorodibenzofuran at 1.4 ppm., hexachlorodibenzofuran at 9.9 ppm, heptachlorodibenzofuran at 88 ppm, and octachlorodibenzofuran at 43 ppm (McConnell, 1988).

The results of the study demonstrate that both grades of pentachlorophenol tested show significant increases in liver and kidney tumors in male B6C3F1 mice and increases in vascular tumors in female mice of the same strain. Using linear low dose extrapolation, a report completed for Vulcan Materials Co. in May of 1988 finds that, using the Crump

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Global 86 Multistage Procedure, the purified pentachlorophenol exhibits a $Q1^*$ for humans of 0.245 (mg/kg/day)-1 and the technical grade pentachlorophenol exhibits a $Q1^*$ of 0.788 (mg/kg/day)-1 (Litt, 1988). These values are approximately four to five orders of magnitude lower than the $Q1^*$ of 11,000 (mg/kg/day)-1 for HxCDD calculated from the data in the NCI bioassay that served as EPA's basis for selecting HxCDD both as the basis for listing F021 and F027 and as the basis for designating F021 and F027 as acute hazardous waste.[3] The data also demonstrate that pentachlorophenol is itself carcinogenic.

Based on the recent data provided by NTP, EPA has concluded that the assumption that HxCDD can serve as a reasonable surrogate to indicate the toxicity of pentachlorophenol wastes may not be appropriate. The new data indicate that the purified and technical grades of pentachlorophenol (with concentrations of HxCDD and other dioxins and furans generally two orders of magnitude higher than the concentrations found in F032) exhibit significantly lower carcinogenic potentcy than EPA had anticipated when listing F021 and F027. Moreover, the $Q1^*$ values generated from the liver tumor data reported by NTP are comparable to, or lower than, those exhibited by the constituents of other wastes that have been listed as toxic hazardous waste by EPA. For example, five waste streams from the production of inorganic pigments (K002, K003, K004, K005, and K006) are listed for their Chromium VI content. EPA's CRAVE presently reports a $Q1^*$ for Chromium VI of 41 (mg/kg/day)$^{-1}$. EPA Hazardous Waste No. K019, heavy ends from the distillation of ethylene dichloride in its production, is listed for a number of carcinogenic chlorinated organic chemicals. The most potent of these, ethylene dichloride has a $Q1^*$ of 1.2 (mg/kg/day)$^{-1}$ for inhalation exposures and 0.6 (mg/kg/day)$^{-1}$ for oral exposures. As a third example, EPA Hazardous Waste No. K041 (wastewater treatment sludge from the production of toxaphene) is listed on the basis of its toxaphene concentration, which has an EPA CRAVE-calculated $Q1^*$ of 1.1 (mg/kg/day)$^{-1}$ (Ratcliff, 1988). All of these wastes are listed as toxic on the basis of carcinogens that are as potent as or more potent than the mixtures of pentachlorophenol studied by NTP.

Waste characterization data obtained by EPA for F032 wastes indicate that these wastes contain a median HxCDD concentration of 5,000 ppb (or 5 ppm), less than one-half the maximum concentration reported for the NTP composite. Other dioxin homologues, including tetrachlorodibenzodioxins, pentachlorodibenzodioxins, and heptachlorodibenzodioxins, are also typically present in F032 and F033 wastes at concentrations one to two orders of magnitude lower than the HxCDD concentrations. Pentachlorophenol concentrations in F032 and F033 wastes range from 0.01 ppm to 160,000 ppm (median: 80,000 ppm). EPA therefore believes it may be appropriate to assume that the toxicity of the mixtures tested by NTP is similar to the toxicity of F032 and F033 wastes. The Agency solicits comments on this assumption.

Although the NTP test mixtures differ from the typical make-up of F032 and F033 wastes, the concentrations of all of the dioxin homologues reported by NTP for their test materials are considerably higher than those documented for dioxin homologues in F032 and F033. Because the Agency has concluded that the new toxicity data indicate that mixtures of pentachlorophenol and dioxin homologues are dominated, in terms of their carcinogenic potency, by pentachlorophenol, EPA further concludes that a designation of toxic rather than acute hazardous is warranted for F032 and F033. Available data show that pentachlorophenol is likely to be the principal determinant of the relative toxicity of the waste. The cited references and further discussions of EPA's analyses appear in the docket.

In listing a waste as hazardous, EPA is not concerned solely with the toxicity of individual waste constituents. Rather, EPA must base listing decisions on a consideration of both the potential toxicity of a waste and the mobility and persistence of waste constituents (i.e., their probability of reaching environmental receptors in significant concentrations). The Agency does not now have data that demonstrate conclusively how pentachlorophenols or the dioxin and furan constituents of F032 and F033 would move in the environment and what their relative ground water concentrations would be in a representative environmental setting. EPA has noted, however, that considerable ground water contamination has been documented at wood preserving facilities. Data reviewed by EPA show that both the pentachlorophenol and the dioxin and furan constituents eventually migrate to the ground water. EPA believes that exposures to ground water consumed as drinking water contaminated with F032 or F033 wastes would involve simultaneous ingestion of pentachlorophenol, dioxins, and dibenzofurans at relative concentrations similar to those present in the waste. EPA solicits comment on this assumption. The Agency believes that the health risks associated with such exposures are best represented by the data from the NTP study.

EPA specifically requests comment on the appropriate designation of F032 and F033 as toxic rather than acute hazardous. Information received on this issue may result in the Agency reevaluating its proposal to designate F032 and F033 as toxic. Again, the Agency is not soliciting comment regarding existing F listings; ample opportunity for public comment concerning the appropriate designation of F021 and F027 will be provided if and when a proposal to change the designation is deemed appropriate.

F. Technical Standards for Drip Pads

The amendments proposed today include additional standards applicable to drip pads in treated wood storage yards and in kick back areas used in managing hazardous waste at wood preserving and surface protection facilities. These standards are intended to provide for proper handling of treated wood drippage.

At many wood preserving facilities, treated wood is stored in open, unpaved storage yards where excess preservative drips from the wood or is washed away by rain. The drippage and contaminated rainwater are often allowed to run onto the ground and may be collected in ditches or ponds, or they are allowed to run into nearby surface water, thereby contributing to soil, surface water, and ground-water contamination. The hazards posed by contamination from drippage that mixes with other wastes or is contained in rainwater result from this practice of allowing excess preservative to drip or wash from treated wood to the ground in wood storage yards and are part of the basis for including treated wood drippage in the proposed listings.

Available data show that considerable surface water, soil, and ground water contamination presently exists at wood preserving and surface protection-sites. These data show that soils and sediments from accumulated mixtures of drippage and waste or

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[3] In its own evaluation of the NTP reports, EPA has calculated similar $Q1^*$ values using the data reported for liver tumors. EPA has also calculated $Q1^*$ values using the data for hemangiosarcomas reported by NTP and may determine that these data provide a more accurate estimate of the carcinogenicity of the two pentachlorophenol mixtures. EPA's calculations are available in the public docket for this rule.

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rainwater may contain significant concentrations of the constituents of concern, including pentachlorophenol, PCDDs, and PCDFs. The data indicate that significant environmental contamination (and potential threat to human health and the environment) results where storage residuals (from drippage) from wood preserving and surface protection are allowed to accumulate in surface impoundments, ditches, or other collection units and they support EPA's decision to include drippage and drippage residual in the proposed listings.

Generators of F032, F033, and F035 drippage (and any water or wastes that become mixed with drippage) must manage it in accordance with Subtitle C requirements. Generators who dispose of drippage on the ground must conduct such disposal in accordance with Subtitle C requirements, including the prohibition on disposing liquids in landfills (see 40 CFR 264.314 and 265.314). Generators of treated wood drippage will therefore become owners and operators of hazardous waste treatment, storage, and/or disposal facilities subject to the 40 CFR Part 264 permitting standards, the 40 CFR Part 265 interim status standards, and associated standards for permit applications and other requirements. Under the existing Part 264 and 265 standards, generators may operate either tanks or land disposal units to manage their treated wood drippage. Today's proposal would add Part 264 permitting and Part 265 interim status standards for drip pads. In the event that drippage is collected and is moved from the drip pad within 90 days following generation, generators may avail themselves of the 90-day accumulation standards of 40 CFR 262.34, and would not need Part B permits for their drip pads or tanks (consistent with § 264.1(g)(3), 265.1(c)(7), and 270.1(c)(2)(i)) provided that they comply with the Part 265 standards, as required by 40 CFR 262.34.

EPA recognizes that, at some wood preserving facilities, concrete pads have been installed to route drippage in kick back and storage areas to collection areas or devices. EPA believes that most drip pads are constructed so that drippage runs off the pad, which is sloped, and collects in a sump or in some other depressed area (other than land) associated with (or part of) the pad. The drippage then accumulates in this collection area or device until removed for recycling, disposal, storage, or treatment.

These associated collection areas or devices generally will meet the definition of a hazardous waste storage tank (see 40 CFR 260.10) and are therefore subject to applicable standards under 40 CFR Parts 264 and 265 Subparts J. EPA does not believe, however, that the drip pads themselves meet the definition of a tank. These pads resemble floors, which are neither tanks nor "ancillary equipment" for tanks, and are not currently subject to regulation.

Because no management standards currently apply to drip pads, EPA is proposing to designate drip pads as a new hazardous waste management unit and to impose standards for the operation of these pads. EPA is thus proposing to add a definition to § 260.10 for drip pads at wood preserving and surface protection facilities and add to Part 264 technical permitting standards and Part 265 interim status standards for drip pads at wood preserving and surface protection facilities. EPA is also proposing amendments to the 90-day accumulator rule of § 262.34 that will allow generators who operate drip pads at wood preserving and surface protection facilities to operate their drip pads without obtaining a RCRA Part B permit, provided that they: (1) Remove collected drippage from the drip pad and associated collection area or device within 90 days following generation, (2) comply with the Part 264 technical standards for drip pads at wood preserving and surface protection facilities, (3) label or mark each drip pad with the words "Hazardous Waste", (4) mark each drip pad with the date on which accumulation began in a manner that is visible for inspection, and (5) comply with the requirements for 40 CFR Part 265, Subparts C and D and § 265.15 for preparedness and prevention, contingency plan and emergency procedures, and inspections. EPA does not solicit, and will not respond to, any comments regarding the basis for, scope, or applicability of the existing regulation at 40 CFR 262.34.

The proposed Part 264 technical standards specify design and operating requirements for drip pads at wood preserving and surface protection facilities. The standards include requirements for containment systems, inspections, and for preventing trackage of drippage from kick back, drip, and storage areas. The standards would also require that generators operating drip pads at wood preserving and surface protection facilities comply with all of the general requirements of Part 264 Subparts A through H. The specific technical requirements are discussed in detail later in this section.

1. Part 264 Technical Standards for Drip Pads (40 CFR Part 264, Subpart T)

The technical standards for drip pads have been designed to provide substantial protection, and resemble to a large degree the existing standards for hazards waste tanks. The drop pad standards add a novel requirement to prevent the tracking of hazardous waste off the pad by equipment or personnel. The standard for preventing tracking of waste off of drip pads is included because information available to EPA shows that tracking can cause soil contamination and may be a significant mechanism by which cross-contamination occurs at facilities that use more than one preservative at a single location. The Agency requests comment on all aspects of the proposed technical standards.

a. Requirements for containment systems (40 CFR 264.571). The proposed standards for drip pads at wood preserving and surface protection facilities require that drip pads be constructed of a curbed, impervious base (e.g., concrete) that is sloped or otherwise designed to drain accumulated liquids resulting from drippage and precipitation. Drip pads and associated collection areas or devices (systems) that are exposed to rain must have sufficient capacity to contain the water from a 25-year/24-hour storm event. The pad must also be surrounded by a dike or berm to prevent water from running onto it. Accumulated materials must be removed from the associated collection system at intervals sufficient to prevent overflow onto the drip pad. The standards for containment systems further require that drip pads be maintained in good condition (i.e., without cracks or visible signs of leakage). Any pad that is visibly cracked or otherwise not capable of containing drippage must be repaired or promptly removed from service.

b. General operating requirement (40 CFR 264.572). In order to prevent hazardous waste or hazardous constituents from being tracked from treated wood drip pads, the proposed standards include a general operating requirement which specifies that drip pads must be operated and maintained such that tracking of drippage off-site is prevented. To comply with this requirement, generators must have equipment (e.g., forklifts, tram cars, etc.) that is dedicated for use on each drip pad and that does not leave the pad. Personnel working on drip pads should decontaminate any clothing or shoes before they are taken off a drip pad site. During the course of EPA's data and

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information collection activities to support this proposal, Agency personnel received descriptions of and observed wood preserving facilities that have already initiated such practices in order to prevent releases of wood preserving chemicals (This information is available in the docket for this rulemaking). The Agency therefore anticipates that many wood preserving facilities are already using practices that meet this requirement.

c. Inspection requirements (40 CFR 264.573). Today's proposed standards for drip pads require that owners and operators inspect their drip pads at least weekly for signs of cracking or deterioration that could lead to releases of hazardous waste. The inspection standard specifies that the entire surface of all drip pads be inspected weekly. This requirement is intended to ensure that portions of the drip pad that are covered by treated wood for extended periods of time are inspected regularly for signs of deterioration. At facilities where treated wood is held for more than one week, owners and operators may need to move wood periodically so that all parts of the drip pad can be inspected on schedule. Under the general requirements of Part 264, owners and operators would also be required to maintain records of their inspections.

d. Closure requirements (40 CFR 264.574). At closure, owners and operators of drip pads would be required to remove all hazardous waste and hazardous waste residues from the drip pad. The base and any contaminated soil would also have to be decontaminated at closure.

2. Part 265 Interim Status Standards (40 CFR Part 265, Subpart T)

The interim status standards for drip pads at wood preserving and surface protection facilities include all of the same requirements as the proposed Part 264 standards.

G. Equipment Cleaning or Replacement Standards for Wood Preserving and Surface Protection Facilities

1. Applicability

As stated previously, documented cases of cross-contamination following a changeover of wood preserving or surface protection formulations require that both past and current use of a formulation be included in the listing descriptions. The Agency realizes that generators can take measures following a changeover of formulation to abate cross-contamination. Consequently, the Agency is proposing equipment cleaning and replacement procedures that, if adhered to, would cause waste at these facilities generated in processes that do not use chlorophenolic formulations to no longer meet the listing description of F032. Such wastes, however, may meet the description of the other wood preserving hazardous waste listings, such as F034 or F035 or exhibit one or more of the hazardous waste characteristics. Further, equipment cleaning or replacement procedures apply to facilities engaged in surface protection processes that currently use or previously used chlorophenolics. Once the procedures are adhered to, wastes from processes that do not use chlorophenolics would no longer meet the listing description of F033. Consequently, these wastes would only be regulated under Subtitle C of RCRA if they exhibit one or more of the characteristics of hazardous waste. Generators should note that the wastes generated from equipment cleaning and replacement, pursuant to this section, must be treated as listed F032 or F033 waste.

EPA believes that the cleaning procedures are necessary in order to allow wastes known not to contain PCDDs and PCOFs to be handled in accordance with their potential hazard. The Agency is concerned with these wastes in particular, because of the small number of permitted and interim status facilities (and hence low capacity) able to receive dioxin-containing wastes. The existing capacity shortage and the reported tendency of hazardous waste handlers to turn away any hazardous waste that may contain chlorinated dioxins, regardless of its regulatory status under RCRA, has raised concerns about growing quantities of waste for which there may be no viable treatment or disposal option. EPA is proposing the equipment cleaning and replacement standards for generators of F032 and F033 wastes as one measure that can be taken to avoid exacerbating the existing capacity shortage. Today's proposal does not include provisions for equipment cleaning and replacement to alleviate cross-contamination between creosote and inorganic preservative processes because the hazardous constituents of F034 and F035 do not raise the same concerns. F034 and F035 thus are listed by process rather than by facility. EPA solicits comment however, concerning the potential benefits of a facility-based listing description for F034 and F035 and of applying the equipment cleaning and replacement provisions to such listings.

2. Equipment Cleaning or Replacement Performance Standard

The performance standards require that the owner or operator of the facility must clean or replace all equipment that may have come into contact with chlorophenolic formulations or constituents originally present in the formulations. This must be done in a manner that eliminates the release of hazardous waste, hazardous constituents, leachate, or hazardous waste decomposition products from prior use of chlorophenolics to the environment (as detailed in the cleaning and replacement requirements). If equipment cleaning and replacement procedures have been completed satisfactorily, it can be demonstrated that the wastes generated will no longer meet the listing description of F032 or F033 because there will be no cross-contamination from the previous use of chlorophenolics.

3. Equipment Cleaning or Replacement Requirements

Generators must follow the equipment cleaning or replacement standard according to a plan written by the generator or his representative. Once the plan is carried out, it must be signed by the generator and a copy of the certified plan must be submitted to the Regional Administrator along with other information, as explained below.

The plan must stipulate methods to remove all visible residues from equipment including, but not limited to, sumps, tanks, piping systems, drip pads, forklifts, and trams. Further, the plan must detail the use of solvent rinsing to remove non-visible contaminants. Rinsing must continue until no chlorophenolics or dioxins are detected in the final rinse using the testing method required. Alternatively, the plan may describe methods to replace all the process equipment that may have come into contact with chlorophenolic formulations. The standard requires that all residues from the cleaning operations and all discarded equipment that has not been decontaminated must be handled as either F032 or F033 depending upon the type of process for which the equipment was used.

4. Previous Equipment Cleaning or Replacement Provision

If it can be documented that pervious equipment or replacement procedures have been conducted, and that they meet the proposed standards of § 261.35, this information, verified by the owner or operator, may be used to fulfill the equipment cleaning or replacement requirements. If this alternative is used, the generator must document (by providing records of all the formulations and existing processes used on-site) that no further cross-contamination could

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have occurred following the cleaning or replacement. Further, generators must submit documentation of prior equipment cleaning or replacement and continued use of non-chlorophenolic formulations to the EPA Regional Administrator, along with a certification of its authenticity, and must receive the Regional Administrator's written approval before the generator can be considered to have complied with the equipment cleaning and replacement standards and the wastes can be considered to no longer meet the listing discription of F032 or F033. The Regional Administrator will review the information submitted to determine whether all necessary equipment has been cleaned or replaced and that cleaning has been verified through adequate and appropriate testing, as required by § 261.35.

5. Testing Requirement

The procedure also specifies certain testing and recordkeeping requirements. Following equipment cleaning, SW-846 Method 8290 must be used to analyze for dioxins and dibenzofurans (Method 8290 has been proposed for addition to SW-846 but has not been added in final form. EPA expects that Method 8290 will be final before this proposed rule becomes effective. A description of Method 8290 is available in the docket for this rule). Once the contaminants are no longer detected in the solvent rinse using these methods, the equipment is judged clean and the equipment cleaning or replacement standard has been met.

6. Notification, Review, and Approval

Generators intending to use the equipment cleaning or replacement procedures so that their wastes will not meet the F032 or F033 listing decription must submit a notification of their intent to clean and replace equipment to the Regional Administrator 30 days before cleaning and replacement activities commence. Within 30 days following completion of equipment cleaning and replacement activities, generators must submit copies of all records and the cleaning and replacement plan together with a signed certification to the Regional Administrator. Under the proposed rule, the Regional Administrator will review all documentation provided and make a determination concerning whether the generator has fully complied with the equipment cleaning and replacement standards.

In the event that the Regional Administrator notifies the generator of a tentative determination that the requirements for equipment cleaning and replacement have not been met, the generator will be allowed 30 days to provide any additional information that would support a change in the determination. After receipt of any additional information, the Regional Administrator must notify the generator of the final determination within 30 days. A determination that all equipment cleaning and replacement requirements have been met becomes effective immediately and the subject wastes would then no longer meet the listing description of F032 or F033, provided that the generator does not resume or initiate use of chlorophenolic formulations. They may, however, continue to be RCRA hazardous waste either because they meet other listing descriptions (e.g., F034 or F035) or because they exhibit one or more of the characteristics of hazardous waste.

H. Test Methods for Compounds Added to Appendices VII and VIII of 40 CFR Part 261

In order to analyze for the constituents of concern present in today's proposed listed wastes, appropriate analytical procedures must be specified. Tables 1 and 2, in 40 CFR Part 261, Apendix III list the analytical methods authorized by the Agency for organic and inorganic compounds. These procedures are described in EPA Publication SW-846: "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," (U.S. EPA, 1986), a copy of which is included in the docket for this proposal. The detection limits required for these analyses are those specified by SW-846.

The majority of the wood preserving and surface protection constituents of concern already have analytical methods assigned to them in Part 261. Today's proposal will add benzo(d)fluoranthene to Appendix III. Benzo(k)-fluoranthene can be analyzed for using method numbers 8100, 8250, 8270, or 8310.

Today's proposal also adds heptachlorodibenzo-*p*-dioxins and heptachlorodibenzofurans to the list of hazardous constituents of 40 CFR Part 261, Appendix VIII. These two chemicals belong to the family of PCDDs and PCDFs already listed in Appendix III. Method 8290, listed on Appendix III as the method of analysis for PCDDs and PCDFs, should be used to analyze for heptachlorodibenzo-*p*-dioxins and heptachlorodibenzofurans. EPA notes that Method 8290 has been proposed for addition to SW-846. EPA expects that the method will be added in final form before the effective date of this proposed rule. A description of Method 8290 is available in the docket for this proposed rule.

The test methods are designed for use in detecting specified substances by applicants who wish to conduct waste evaluations in support of delisting petitions (40 CFR 260.22), and by owners or operators of hazardous waste management facilities who must conduct ground water or incinerator monitoring (See, e.g., 40 CFR 264.99 and 264.341).

I. Applicability of RCRA Rules for Recycled or Reclaimed Hazardous Waste

EPA recognizes that certain wastes from wood preserving and surface protection processes are recycled or reused at the generating site. For example, information on waste management practices collected by EPA shows that drippage from wood preserving, particularly drippage collected in kick-back areas, is often recycled back to the process. Wastewaters generated by inorganic wood preserving processes also are commonly recycled on-site by return them to the process.

Secondary materials that are used or reused directly either as a feedstock or as an effective substitute for commercial chemical products are also not considered to be solid wastes provided that the reuse is not use constituting disposal or use as a fuel (See 50 FR 665, January 4, 1985).

On January 8, 1988, EPA proposed amendments to the Definition of Solid Waste (see 53 FR 519) regarding regulation of recycled materials under Subtitle C or RCRA. These proposed amendments constituted EPA's response to a ruling made by a panel of the District of Columbia Circuit Court of Appeals in the matter of *American Mining Congress v. EPA*, 824 F.2d 1177 (DC Cir. 1987). The amendments propose to exclude from being solid wastes certain in-process recycled materials from the petroleum refining industry and certain other sludges, by-products, and spent materials that are reclaimed as part of continuous, on-going manufacturing processes. Under the proposed amendment, secondary materials that are reclaimed and returned to the original processes in which they were generated are excluded from Subtitle C regulation if any storage that occurs before recycling takes place in tanks and the return process takes place through a "closed loop" that is "* * * entirely connected with pipes or other comparable enclosed means of conveyance" (see 53 FR 529).

Information available to EPA regarding the manner in which process residuals are reclaimed in wood

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preserving and surface protection processes indicates that these materials are not typically reused directly. In addition, recycling does not take place in closed-loop systems of the type anticipated by the proposed amendment. EPA therefore believes that most on-site recycling at wood preserving and surface protection facilities would not quality for either the existing or the proposed exclusion.

Generators should note that, under 40 CRF 261.6 (b) and (c), any recyclable materials that are hazardous waste are subject to the applicable requirements of Parts 262 and 263 (standards for generators and transporters of hazardous wastes, respectively). Storage of recyclable materials also is subject to all of the applicable requirements of Part 264, and generators are required to comply with the notification requirements of section 3010 of RCRA and the requirements of 40 CFR 265.71 and 265.72 for use of the manifest and manifest discrepancies. While generation, storage, and transportation of recyclable materials are regulated the same as other hazardous waste, the actual recycling process does not need a RCRA permit.

Additionally, EPA has previously promulgated regulations for recyclable materials that are used in a manner constituting disposal (see 40 CFR 266.20 through 266.23) and standards for hazardous waste burned for energy recovery (see 40 CFR 266.30 through 266.35). Generators should note that, to the extent that the wastes proposed for listing today are recycled in ways that constitute disposal or are burned for energy recovery in boilers or industrial furnaces that are exempt from regulation under Subpart O of Part 264, the appropriate standards of Part 266 apply.

III. State Authority

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR Part 271 for the standards and requirements for authorization.) Following authorization, EPA retains enforcement authority under sections 3008, 7003 and 3013 of RCRA, although authorized States have primary enforcement responsibility.

Prior to the Hazardous and Solid Waste Amendments of 1984 (HSWA), a State with final authorization administered its hazardous waste program entirely in lieu of EPA administering the Federal program in the State. The Federal requirements no longer applied in the authorized State, and EPA could not issue permits for any facilities in the State which the State was authorized to permit. When new, more stringent Federal requirements were promulgated or enacted, the State was obliged 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, however.

In contrast, under section 3006(g) of RCRA, 42 U.S.C. 6926(g), new requirements and prohibitions imposed by the HSWA take effect in authorized States at the time that they take effect in nonauthorized States. EPA is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, the HSWA applies in authorized States in the interim.

Certain portions of today's rule are proposed pursuant to section 3001(e) of RCRA, a provision added by HSWA. Therefore, the Agency is proposing to add these requirements to Table 1 in 40 CFR 271.1(j), which identifies the Federal program requirements that are promulgated pursuant to HSWA and that take effect in all States, regardless of their authorization status. States may apply for either interim or final authorization for the HSWA provisions identified in Table 1, as discussed in the following section of this preamble.

B. Effect on State Authorization

As noted previously, certain portions of today's rule are being proposed pursuant to provisions added by HSWA, while others are being proposed pursuant to pre-HSWA authority. The addition of F032 and F033 to the list of hazardous wastes from non-specific sources and the equipment cleaning and replacement standards for F032 and F033 wastes are proposed pursuant to section 3001(e) of RCRA, a provision added by HSWA. These standard will therefore take effect in all States (authorized and non-authorized) on the effective date. Permitting and interim status drip pad standards associated with F032 and F033 wastes will take effect on the effective date pursuant to 40 CFR 264.1(f)(2) and proposed § 265.1(c)(4)(iii) (see below). The addition of F034 and F035 to the list of hazardous wastes from non-specific sources and the addition of test methods to Appendix III of Part 261 are not immediately effective in authorized States since the requirements are not pursuant to the HSWA. The permitting and interim status standards for drip pads associated with F034 and F035 wastes will therefore only become effective in authorized States when F034 and F035 become hazardous waste in each authorized State and when the State is authorized for the drip pad standards.

1. HSWA Provisions

As noted above, EPA will implement the addition of F032 and F033 to the list of hazardous wastes from non-specific sources (and the standards for equipment cleaning and replacement) in authorized States until the States modify their programs to adopt these rules and the modification is approved by EPA. Because this portion of the rule is proposed pursuant to HSWA, a State submitting a program modification may apply to receive either interim or final authorization under section 3006(g)(2) or 3006(b), respectively, on the basis of requirements that are substantially equivalent to or equivalent to EPA's. The procedures and schedule for State program modifications for either interim or final authorization are described in 40 CFR 271.21. It should be noted that all HSWA interim authorizations will expire January 1, 1993 (see § 271.24(c)).

40 CFR 271.21(e) requires that States having final authorization must modify their programs to reflect Federal program changes, and must subsequently submit the modifications to EPA for approval. The deadline by which States must modify their programs to adopt this proposed regulation will be determined by the date of promulgation of the final rule in accordance with § 271.21(e)(2). Once EPA approves the modification, the State requirements become Subtitle C RCRA requirements.

States with authorized RCRA programs may already have requirements similar to those proposed in today's rule. Such State regulations have not been assessed against the Federal regulations being proposed today to determine whether they meet the tests for authorization. Thus, a State is not authorized to implement their regulations as RCRA requirements until the State program modification is submitted to EPA and approved. Of course, States with existing standards may continue to administer and enforce their standards as a matter of State law. In implementing the Federal program, EPA will work with States under cooperative agreements to minimize duplication of efforts. In many cases, EPA will be able to defer to the States in

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their efforts to implement their programs rather than take separate actions under Federal authority.

States that submit their official applications for final authorization less than 12 months after the effective date of these standards are not required to include standards equivalent to these standards in their application. However, States must modify their programs by the deadlines set forth in § 271.21(e). States that submit official applications for final authorization 12 months after the effective date of these standards must include standards equivalent to these standards in their application. 40 CFR 271.3 sets forth the requirements States must meet when submitting final authorization applications.

2. Non-HSWA Provisions

Other portions of today's proposed rule will not be effective in authorized States since the requirements will not be imposed pursuant to the Hazardous and Solid Waste Amendments of 1984. These portions include the addition of F034 and F035 to the list of wastes from non-specific sources, the permitting and interim standards for drip pads that handle F034 and F035 wastes, and the addition of test methods to 40 CFR Part 261, Appendix III. Just these requirements will be applicable in those States that do not have interim or final authorization. In authorized States, these requirements will not be applicable until the States revise their programs to adopt equivalent requirements under State law.

40 CFR 271.21(e)(2) requires that States that have final authorization must modify their programs to reflect Federal program changes and must subsequently submit the modifications to EPA for approval. The deadline by which the States must modify their programs to adopt this proposed regulation will be determined by the date of promulgation of the final rule in accordance with § 271.21(e). Once EPA approves the modification, the State requirements become Subtitle C RCRA requirements.

States with authorized RCRA programs may already have requirements similar to those proposed in today's rule. These State regulations have not been assessed against the Federal regulations being proposed today to determine whether they meet the tests for authorization. Thus, States are not authorized to carry out their regulations as RCRA requirements until State program modifications are submitted to EPA and approved. Of course, States with existing standards may continue to administer and enforce their standards as a matter of State law.

States that submit their official application for final authorization less than 12 months after the effective date of these standards are not required to include standards equivalent to these standards in their application. However, States must modify their programs by the deadlines set forth in § 271.21(e). States that submit official applications for final authorization 12 months after the effective date of those standards must include standards equivalent to these standards in their applications. 40 CFR 271.3 sets forth the requirements States must meet when submitting final authorization applications.

3. Special Provision for Drip Pad Standards Applicable to F032 and F033

Under 40 CFR 264.1(f)(2), EPA may issue permits in authorized States if the subject regulated unit was not regulated under RCRA at the time of the State's authorization and the standards for permitting the unit were promulgated after the State received final authorization. At the time that today's rule is promulgated, EPA will therefore, under 40 CFR 264.1(f)(2), issue permits for drip pads used in association with F032 and F033 wastes in authorized States.

Similarly, EPA is proposing to add § 265.1(c)(4)(iii) to be able to impose Federal interim status standards on drip pads that handle F032 and F033 wastes. This section, which is an exact corollary to § 264.1(f)(2), would subject to interim status standards a waste listed under HSWA and therefore hazardous within the State until the State becomes authorized for the listed waste and for the management standards.

The standards for drip pads as they apply to F032 and F033 thus will become applicable in both authorized and unauthorized States upon promulgation. EPA will not implement the standards for permitting drip pads as they apply to F034 and F035 wastes in authorized States. These standards will become effective in authorized States when the State modifies its program in accordance with 40 CFR 271.21(e), presumably at the same time as the F034 and F035 listing become applicable in authorized States.

IV. CERCLA Designation and Reportable Quantities Adjustment

The wastes proposed to be listed as hazardous in today's notice will, on the effective date of the final rule, automatically become hazardous substances under section 101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended. CERCLA section 103(a) requires that persons in charge of vessels or facilities from which a hazardous substance has been released in a quantity that is equal to or greater than its reportable quantity (RQ) immediately notify the National Response Center (at (800) 424–8802 or at (202) 426–2675) of the release.

Under section 102(b) of CERCLA, new RCRA hazardous waste listings with constituents that have not been previously designated as hazardous under CERCLA have the statutorily-imposed RQ of 1 pound unless or until adjusted by regulation. In order to coordinate the RCRA and CERCLA rulemakings with respect to new waste listing, the Agency today is proposing regulatory amendments under CERCLA authority in connection with the proposed listing of wastes F032, F033, F034, and F035. The Agency is jointly proposing with the waste listings to: (1) Designate wastes F032, F033, F034, and F035 as hazardous substances under section 102(a) of CERCLA; and (2) adjust the RQs of wastes F032, F033, F034, and F035 based on the application of a proposed RQ adjustment methodology.

The Agency is proposing adjustments from the statutory RQs established under CERCLA section 102 based upon the adjustment methodology described in previous final rules (50 FR 13456 (April 4, 1985), and 51 FR 34534 (September 29, 1986)) and a proposed rule (52 FR 8140, March 16, 1987). The proposed RQs for newly listed hazardous wastes are based on the RQs of the hazardous constituents of the newly listed hazardous wastes identified under RCRA. Thus, if a newly listed hazardous waste has only one constituent of concern, and that constituent is a CERCLA hazardous substance, the waste will have a proposed RQ that is the same as the RQ for the constituent (whether statutory or finally adjusted). If the hazardous waste has more than one constituent of concern and all constituents are CERCLA hazardous substances, the lowest RQ assigned to any of the constituents will be the proposed RQ for the hazardous waste.

If the waste has both CERCLA and non-CERCLA constituents, the proposed RQ for the waste will be the lowest RQ of any of the constituents. The non-CERCLA constituents will be evaluated and given an RQ value for the purpose of adjusting the RQ of the hazardous waste (however, constituents cannot be assigned RQs until they are designated as CERCLA hazardous substances). If the RQ value for any of the non-CERCLA constituents is lower than the RQ values for the CERCLA constituents, the waste will be proposed for

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adjustment at this lower level. If the waste has only non-CERCLA constituents the RQ will be proposed for adjustment at the level of the lowest RQ value of any constituent.

EPA has previously adjusted RQs for wastes on the basis of hazardous constituents that are not CERCLA hazardous substances by attributing an RQ to such constituents in order to assign an appropriate RQ to the waste stream (see 48 FR 23565, May 25, 1983). In other words, the Agency derives the RQ for a waste stream based upon the lowest RQ of all of the hazadous constituents known to be in the waste, regardless of whether the constituents are CERCLA hazardous substances. EPA is proposing to use this adjustment methodology for the wastes proposed for listing today. The "RQ" developed for non-CERCLA substances is used for ranking purposes only; no releases of such constituents need be reported to the National Response Center.

The proposed RQs apply to the waste streams, not just to the CERCLA hazardous substances. CERCLA does not require persons in charge of vessels or facilities to analyze wastes to determine the concentrations of individual hazardous constituents in a mixture; however, if a person has completely analyzed the waste and determines that the amount released of each constituent is below its respective RQ, no notification is required (see 40 CFR 302.6(b)). (See also 50 FR 13463 dealing with mixtures of hazardous substances.) This does not mean that the hazardous waste stream will have an RQ other than the one listed on Table 302.4 of 40 CFR Part 302 for that hazardous waste stream. This has been a source of confusion for the regulated community and will be clarified in future rulemakings.

Table 16 lists the proposed RQs for hazardous wastes that are proposed to be designated as CERCLA hazardous substances as well as the RQs for each hazardous constituent of the hazardous wastes. Hazardous waste streams F032, F034, and F035 contain constituents with RQs of 1 pound. Therefore, the proposed RQ for each of these hazardous wastes is 1 pound. For hazardous waste stream F033, the lowest RQ for a constituent with an established RQ is 10 pounds. Therefore, the proposed RQ for waste stream F033 is 10 pounds.

TABLE 16.—PROPOSED RQS FOR CERCLA HAZARDOUS SUBSTANCES

Hazardous substance	Constituent	RQ (lbs)	Future final RQ (lbs)
Waste No. F032.		1	
	Arsenic	1	1
	Benz (a) anthracene	1	10
	Benzo (a) pyrene	1	1
	Chromium	1	5,000
	Dibenz (a,h) anthracene.	1	1
	Indeno (1,2,3-cd) pyrene.	1	100
	Lead	1	100
	Naphthalene	100	
	Pentachlorophenol	10	10
	Phenol	1,000	
	Tetrachlorodibenzo-*p*-dioxins.	**	
	Pentachlorodibenzo-*p*-dioxins.	**	
	Hexachlorodibenzo-*p*-dioxins.	**	
	Heptacholorodibenzo-*p*-dioxins.	**	
	Tetrachlorodibenzofurans.	**	
	Pentachlorodibenzofurans.	**	
	Hexachlorodibenzofurans.	**	
	Heptachlorodibenzofurans.	**	
Waste No. F033.		10	
	Pentachlorophenol	10	10
	2,3,4,6-Tetrachlorophenol.	10	
	2,4,6-Trichlorophenol	10	10
	Tetrachlorodibenzo-*P*-dioxins.	**	
	Pentachlorodibenzo-*p*-dioxins.	**	
	Hexachlorodibenzo-*p*-dioxins.	**	
	Heptachlorodibenzo-*p*-dioxins.	**	
	Tetrachlorodibenzofurans.	**	
	Pentachlorodibenzofurans.	**	
	Hexachlorodibenzofurans.	**	
	Heptachlorodibenzofurans.	**	
Waste No. F034.		1	
	Arsenic	1	1
	Benz (a) anthracene	1	10
	Benzo (k) fluoranthene	1	5,000
	Benzo (a) pyrene	1	1
	Biphenyls	**	
	Chromium	1	5,000
	Dibenz (a,h) anthracene.	1	1
	Indeno (1,2,3-cd) pyrene.	1	100
	Lead	1	100
	Naphthalene	100	
Waste No. F035.		1	
	Arsenic	1	1
	Chromium	1	5,000
	Lead	1	100

** indicates that no RQ is being assigned to the generic broad class.

The Agency notes that only the proposed RQs for the waste streams are open to comment. Consequently, the Agency is not soliciting comments on the RQs for the constituents of concern, nor will it respond to any such comments received.

Each hazardous waste having the characteristics identified under or listed pursuant to section 3001 of RCRA meets the statutory definition of a hazardous substance contained in CERCLA section 101(14). Under CERCLA section 102(a), the EPA Administrator has the authority to designate as a CERCLA hazardous substance any substance referred to in section 101(14). In order to clarify that the RCRA hazardous wastes proposed to be listed in today's rule are subject to CERCLA authority, EPA also proposes to designate hazardous wastes F032, F033, F034, and F035 as hazardous substances under CERCLA section 102(a).

V. Compliance Cost and Economic Impact Analysis

Executive Order No. 12291 requires EPA to prepare an analysis of the costs and economic impacts associated with a proposed regulation. The results of this analysis are used to determine whether the regulation will result in: (1) Incremental annual costs that exceed $100 million, (2) significant increases in costs or prices for consumers or individual industries, or (3) significant adverse effects on competition, employment, investment, innovation, or international trade. If a proposed rule meets any of these criteria, it is a "major rule," as defined by Executive Order No. 12291 and a Regulatory Impact Analysis must be completed before the rule is promulgated.

Today's proposed regulation is not a "major" rule because it will not have an annual economic effect of more than $100 million. This section of the preamble discusses the results of the cost and economic impact analyses undertaken to assess the effects of the proposed rule (DPRA Inc., 1988b). The draft Cost and Economic Impact

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Analysis is available in the public docket for this proposal.

A. Description of Affected Population

1. The Wood Preserving Industry

Those facilities in the wood preserving industry that use chlorophenolic formulations, creosote formulations, or inorganic formulations containing arsenic and/or chromium are subject to the proposed rule. The wood preserving industry produces about 380 million cubic feet of preserved wood per year. Approximately 70 percent of the wood preserving production is treated with arsenical compounds; the balance is treated with creosote (21 percent) and pentachlorophenol (9 percent).

In 1985, 567 plants produced preserved wood in the U.S. The American Wood Preservers Institute reports that 14 additional plants have come into operation since 1985. Approximately 60 percent of all wood preserving plants are located in the southeast and southcentral portions of the U.S. These plants account for 64 percent of annual U.S. production. Most plants that treat with creosote and/or pentachlorophenol are more than 25 years old; several operating plants are more than 75 years old. The use of inorganic preservatives is presently increasing and, as a result, most new wood preserving plants are CCA plants. Facilities that treat with inorganic preservatives exclusively are, on average 10 years old.

2. The Surface Protection Industry

The surface protection industry consists of approximately 6,000 sawmills. EPA estimates that approximately 1,500 sawmills have used sodium pentachlorophenate to control sapstain; these facilities are subject to the proposed rule. Of these 1,500 sawmills, the Agency estimates that approximately 250 to 300 sawmills currently use chlorophenolic solutions to control sapstain. Sapstain control (surface protection) can also be accomplished using: (1) Water storage of logs, (2) rapid processing of sawn lumber and kiln-drying, or (3) use of chemicals other than sodium pentachlorophenate. Surface protection facilities that have never used chlorophenolic solutions are not subject to the proposed rule.

B. Regulatory Assumptions Used in this Analysis

As described previously, today's proposed rule would add four wastes from the wood preserving and surface protection industries to the list of hazardous wastes from non-specific sources. Each of the hazardous waste listings identifies four components: wastewaters, process residuals, preservative drippage, and discarded spent preservative formulations. Specific practices required for each component under the proposed rule are discussed below. These required practices form the regulatory basis for compliance cost and economic impact analysis.

1. Compliance Practices that Contribute to Incremental Costs

As a result of the proposed rule, generators of F032, F033, F034, and F035 wastes will be required to collect and manage treated wood drippage. Generators may choose to use tanks or surface impoundments, as well as drip pads to manage drippage wherever it is generated at wood preserving and surface protection facilities, including kick-back areas and treated wood storage yards. EPA believes that because many wood preserving and surface protection plants have drip pads in kick-back areas and some have installed or are installing drip pads in treated wood storage yards, most generators will choose to maintain drip pads throughout their facilities. Drip pads are likely to be concrete pads. They must have berms that effectively prevent off-site migration of drippage and drippage residuals. Drip pads will likely have drainage systems with a sump for collecting drippage and runoff mixed with drippage. Drippage will be managed either by being disposed of or by being recycled.

Process residuals from plants using creosote and inorganic preservatives are assumed to be disposed of and managed in permitted RCRA facilities. Process residuals from facilities using pentachlorophenol are assumed to be incinerated in permitted RCRA incinerators.

Unlike wood preserving facilities, surface protection facilities may switch to alternative chemicals that are not hazardous to comply with the proposed rule, and thereby avoid all compliance costs except the cost of decontaminating their facilities and the incremental cost (if any) of using alternative methods to achieve sapstain control. Surface protection facilities that continue to use sodium pentachlorophenate or choose not to comply with the equipment cleaning and replacement standards must manage process residuals as Subtitle C hazardous wastes.

Surface protection facilities that do not currently use chlorophenolic solutions, but have used sodium pentachlorophenate in the past, will be required to decontaminate their facilities to prevent contamination of sawed wood, production equipment, and wastes with pentachlorophenate residuals, or manage their waste in accordance with Subtitle C requirements. This analysis assumes that decontamination will be accomplished by solvent rinsing until no dioxins or dibenzofurans are detectable.

Wood preserving and surface protection facilities that continue to produce wastes subject to the proposed rule, but that do not already have RCRA permits, will be required to obtain them. The Agency has only identified 25 wood preserving facilities that do not already have a RCRA permit or that will be required to obtain a permit and to comply, for the first time, with interim status standards. Because RCRA-permitted and interim status facilities are subject to corrective action standards, these newly permitted facilities will be subject to corrective action as a result of the proposed rule. Accordingly, the potential cost of corretive action for these facilities is attributed to the proposed rule. However, corrective action costs for those wood preserving facilities that are already permitted or subject to interim status standards are attributable to the corrective action regulations, and not to this rule.

2. Compliance Practices That Do Not Contribute to Incremental Costs

Some of the wastes defined in today's proposed rule are already regulated as characteristic hazardous waste under RCRA. Further, many of the facilities affected by today's proposal may already generate EPA waste K001. Because wood preserving and surface protection plants with these wastes already manage their wastes in regular units, this analysis does not include the costs associated with regulating these types of wastes under the proposed rule.

For example, the majority of wastewaters generated by wood preserving plants using creosote and pentachlorophenol are co-managed with K001 wastes in permitted RCRA units. Wastewaters from plants using only inorganic formulations are generally recycled with zero discharge. Generation of discarded spent preservative formulation is negligible for all segements of the wood preserving industry. Accordingly, this analysis did not include the incremental costs and benefits of managing these wood preserving waste stream components as hazardous wastes.

Surface protection facilities that currently use chlorophenolic solutions can curtail generation of listed wastes by switching to alternate chemicals or

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methods of sapstain control and complying with the standards for equipment cleaning and replacement. This analysis assumes that affected surface protection plants will decontaminate their equipment and switch to didecyl dimethyl ammonium chloride (DDAC), residuals of which are not regulated as hazardous waste. Another option would be to replace contaminated equipment. Because the cost of decontamination is likely to be less than equipment replacement, this analysis assumes that in general, generators will prefer equipment decontamination to replacement.

C. Costs and Economic Impacts

The cost and economic impact analysis has three components: (1) Estimation of compliance costs for model facilities that represent the affected industry; (2) estimation of national costs of the proposed rule on the basis of model facility costs; and (3) an assessment of effects on prices, employment, and the regulated industries.

1. Facility Costs of Compliance

Facility costs were estimated using a three-step process. First, "model" small, medium, and large facilities were developed to represent segments of the industry expected to have different compliance costs. Criteria for small, medium, and large facilities were developed based on the distribution of firms by size (i.e., by numbers of employees) and the size at which the adverse economic impacts appear to rise and fall substantially. Small facilities were defined to be those having fewer than 10 employees; medium facilities were defined as those having more than 10 and fewer than 20 employees; and large facilities were defined as those having more than 20 employees. The model facilities are described in detail in the draft Cost and Economic Impact Analysis. In the second step of the analysis, compliance activities were determined for each of the model facilities and engineering estimates were prepared for each activity. Finally, in the third step of the analysis, the resources required to pay for the compliance practices resulting from the proposed rule were estimated.

Individual facility compliance costs were estimated based on an analysis of the cash flow and waste management practices of model plants. Each model facility is characterized by its annual sales, the number of employees, the volume of waste generated, and its waste management practices. Both the size (annual production) of a facility and the preservatives used affect the cost of complying with the proposed rule.

Compliance cost estimates for each model facility include the cost of managing the residuals described above, plus initial administrative expenses, additional closure costs, and, for four model facilities which represent the estimated 25 facilities that do not currently have RCRA permits and are not subject to interim status standards, corrective action costs.

This analysis uses annual revenue requirements to measure the combined effects of different types of incremental costs attributable to the proposed rule. The annual revenue requirement (ARR) is the additional revenue required by a facility to cover the incremental costs of compliance with the proposed rule, assuming that these costs are financed and discounted over a set period of time. A 20-year period and an 11.3 percent nominal discount rate are used in this analysis.

Table 17 shows the ARRs for each model wood preserving and surface protection facility. Individual wood preserving facilities are projected to incur total incremental annual costs ranging from $24,000 to $608,000 as a result of the proposed rule. In general, larger facilities will have higher total costs than small facilities. The ARRs for model facilities subject to corrective action regulations as a result of the proposed rule are substantially higher than those for similar facilities that are already permitted or currently subject to interim status requirements, because the corrective action costs are substantially higher than compliance costs. The model plant with the highest ARR, $608,000, is a medium-size creosote plant not presently subject to Subtitle C requirements. The Agency believes that there are six creosote plants (five small- and one medium-size) and 19 pentachlorophenol plants (18 small- and 1 medium-size) that would be subject to corrective action as a result of the proposed rule. Again, for purposes of this analysis, EPA has defined small plants as those with fewer than 10 employees, medium plants as those with at least 10 but fewer than 20 employees, and large plants as those with 20 or more employees.

TABLE 17—ANNUAL REVENUE REQUIREMENT FOR MODEL WOOD PRESERVING AND SURFACE PROTECTION FACILITIES AFFECTED BY THE PROPOSED RULE [1,2]

Model facility type (wood preserving)	Permitted ARR [Dollars]	No Permit ARR [Dollars]
Creosote:		
Small	24,000	369,000
Medium	46,000	608,000
Large	91,000	N/A
Pentachlorophenol:		
Small	30,000	375,000
Medium	41,000	386,000
Large	82,000	N/A
Inorganic:		
Small	25,000	N/A
Medium	45,000	N/A
Large	97,000	N/A
Multiple preservatives (medium size assumed):		
Creosote/pentachlorophenol	104,000	N/A
Pentachlorophenol/inorganic	56,000	N/A
Inorganic/creosote	45,000	N/A
All three preservatives	127,000	N/A
Surface protection facilities currently using pentachlorophenate 12 months a year: [3]		
Small	9,000	N/A
Medium	32,000	N/A
Large	100,000	N/A
Large Northwest	360,000	N/A
Surface protection facilities currently using pentachlorophenate 6 months a year:		
Small	6,000	N/A
Medium	18,000	N/A
Large	51,000	N/A

[1] These costs include engineering, corrective action, administrative, and closure costs.

[2] The Annual Revenue Requirement (ARR) shown here does not reflect anticipated price increases that could offset the net revenue requirements for model facilities.

[3] ARRs for surface protection facilities are based on switching to a more expensive alternative chemical, DDAC.

NOTE.—N/A indicates that there are no unpermitted facilities in this preservative and facility size category.

Table 17 shows that the ARRs for eight model surface protection facilities range from $6,000 to $360,000, depending on the size of the facility and the number of months a year the facility uses sapstain-treating chlorophenolic solutions. In general, these costs are lower than compliance costs for wood preserving facilities of comparable size.

2. National Costs of the Proposed Rule

a. Methodology. The national costs of today's proposed rule were estimated using a four-step approach. First, total compliance costs were estimated for each model facility type. Next, the universe of affected facilities was categorized into groups based on preservatives used and size. Third, for

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each model facility type, per-facility compliance costs were multiplied by the number of facilities represented by each model plant type. Fourth, total costs were estimated for the affected facilities in the wood preserving and surface protection industries by adding the total costs for each facility category.

b. Results. The results of this analysis indicate that the aggregate annualized cost of the proposed rule to the wood preserving industry is estimated to be approximately $43 million (1988 dollars). The aggregate annualized cost of compliance for the surfaoe protection industry is estimated to be approximately $11 million. The total estimated cost of compliance with the rule is approximately $54 million (1988 dollars). Because the aggregate annual impact of the proposed rule is less than the $100 million threshold set by Executive Order 12291, the Agency has determined that today's rule is not a major rule.

3. Economic Impact Analysis

The economic impact analysis assesses the impact of the proposed rule on: (1) prices, (2) individual segments of the wood preserving and surface protection industries (including small entities), and (3) employment levels. The methodology used to assess these impacts is briefly described below. Readers requiring a more detailed understanding are referred to the draft Cost and Economic Impact Analysis.

a. Methodology—(1) Price Impacts. The price of treated wood products can be expected to change as a result of the proposed rule. Incremental potential price changes for preserved and surface protected wood products are estimated using a three-step methodology. First, the price increase required to maintain current profits is calculated for each of the model facilities. Second, the ability of each of the model facility categories to raise the price of their products is assessed using model plant estimates and existing market data. Third, the price of treated wood products is estimated based on the results of the first two steps.

(2) Industry impacts. The economic impact of the proposed rule on individual segments of the wood preserving industry were assessed using a three-step approach. First, the ratios of estimated annual compliance costs for model facilities to sales and pre-tax profits (following estimated price increases) were calculated. Second, these ratios were compared with two economic impact test criteria. The first test is whether a model facility's incremental ARR exceeds one percent of annual sales. The second test is whether a model facility's reduction in profits exceeds 20 percent of projected pre-tax profits. If a model facility is projected to exceed both of these ratio thresholds, it is considered "significantly" impacted by the proposed rule. If a model facility is projected to exceed only one of these thresholds, it is not considered to be "significantly" affected by the proposed rule.

In the third step, the number of actual facilities represented by each of the affected model facilities were estimated. As part of this process, the number of small entities subject to substantial economic impacts was estimated.

(3) Employment impacts. Employment impacts were assumed to result from facility closures. Facility closures are difficult to predict for many reasons. For example, the Agency does not have information on the resources potentially available to individual firms that operate more than one wood preseving facility. The potential for facility closures was evaluated by subjecting each of the model plants identified in the industry impacts analysis to additional financial tests. The first test is whether the ratio of the ARR to the estimated cash from operations is greater than 0.5 for a model facility. The second test is whether the capital compliance costs exceed annual investment. These financial tests were designed for the Agency to assess the potential for firm closures as a result of implementation of the small quantity generator regulations (ICF Inc. and DPRA Inc., 1985). A range of potential employment effects, corresponding to the range of results of all of the financial tests for model facilities, was developed.

b. Results—(1) Price impacts. Industry data suggest that large facilities are the price leaders in the industry. Because of the large market share held by large wood preserving firms, this analysis assumes that prices could be increased to cover the estimated incremental compliance costs of the large inorganic and creosote plants. Thus, the wholesale price of creosote-preserved wood would rise 3 cents from $7.20 per cubic foot to $7.23. The wholesale price of inorganic-preserved wood would rise 5 cents from $3.97 per cubic foot to $4.02.

The Agency is not aware of any one large facility that uses pentachlorophenol exclusively; therefore, this analysis assumes that medium-sized plants are the price leaders in this segment and that product prices would rise to cover the incremental costs of medium-sized pentachlorophenol plants. The wholesale price of pentachlorophenol-preserved wood would rise 12 cents from $4.84 per cubic foot to $4.96. For a number of reasons discussed in the Cost and Economic Impact Analysis, incremental costs of corrective action would not be transferred to customers in the form of higher prices. As a result, projected price increases will vary by the preservative that is used in each industry segment.

In contrast to the wood preserving industry, the surface protection industry is unlikely to transfer any of its incremental costs to consumers in the form of higher prices. This is principally because most surface protection facilities do not need to use any chemicals to prevent sapstain, and therefore could generally undersell facilities that attempted to increase their prices to recover incremental regulatory costs.

The price increases described above were not considered significant, and therefore the proposed rule will not have a major impact on prices for consumers or other industries using preserved or surface protected wood.

(2) *Industry impacts.* The effect of the proposed rule on different segments of the wood preserving and surface protection industries is examined by comparing the projected ARR/Sales ratio and the expected reduction in profits with the criteria for identifying "significantly affected facilities" that were presented earlier. ARR/Sales and revised reduction in profits (in percent) for each of the model plants (after projected price changes are taken into account) are shown in Table 18.

Table 18 shows that the unpermitted/ non-interim status model facilities, assumed to incur corrective action costs as a result of the proposed rule, are projected to incur much greater adverse economic impacts than the other affected facilities. This analysis indicates that all small single preservative facilities are projected to incur significant adverse economic effects as a result of the proposed rule. Facilities using pentachlorophenol alone seem likely to sustain the greatest economic impact of all model facilities already subject to Subtitle C requirements.

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TABLE 18.—ARR/SALES AND REDUCTION IN PROFITS FOR MODEL WOOD PRESERVING AND SURFACE PROTECTION PLANTS FOLLOWING EXPECTED PRICE INCREASES

[in percent]

Model plant type (wood preserving)	Permitted ARR/sales	Facilities reduction in profit	Unpermitted ARR/sales	Facilities reduction in profit
Creosote:				
Small	1.3	37	20	820
Medium	0.6	4	8	130
Large	0.5	0	N/A	N/A
Pentachlorophenol:				
Small	3.6	52	45	1,870
Medium	2.3	0	22	390
Large	1.8	0	N/A	N/A
Iinorgranic [1]:				
Small	2.1	38	N/A	N/A
Medium	1.6	6	N/A	N/A
Large	1.3	0	N/A	N/A
Multiple preservatives:				
C/P Medium [2]	1.4	4.4	N/A	N/A
P/I Medium	1.3	6.4	N/A	N/A
I/C Medium	0.8	2.7	N/A	N/A
P/I/C Medium	1.1	1.0	N/A	N/A
Surface protection facilities (that currently use chlorophenolics 12 months a year):				
Small	1.5	57	N/A	N/A
Medium	1.0	22	N/A	N/A
Large	1.0	29	N/A	N/A
Very Large	0.9	28	N/A	N/A
Surface protection facilities (that currently use chlorophenolics 6 months a year):				
Small	1.0	39	N/A	N/A
Medium	0.5	12	N/A	N/A
Large	0.5	15	N/A	N/A

[1] Impact based on model inorganic plants that may have previously used pentachlorophenol. Plants that have never used pentachlorophenol would incur slightly lower impacts.

[2] Multiple preservative plants were assumed to be medium-sized plants in this analysis.

Note.—N/A indicates that all facilities in this category have RCRA permits and would not require corrective action as a result of the proposed rule. Criteria: Model Plants are "significantly" affected if: ARR/Sales Exceeds 1% and ARR/Profit Exceeds 20%.

Table 18 also shows that the small surface protection model facility that treats for sapstain control throughout the year is significantly impacted by the proposed rule. The Agency estimates that approximately 50 to 75 small surface protection facilities use chlorophenolic solutions to control sapstain 12 months, a year, and would incur signifcant adverse economic effects as a result of the proposed rule.

Thus, the proposed rule will significantly impact all small, single preservative wood preserving facilities. Nevertheless, since large, medium and multiple preservative facilities produce the overwhelming majority of all types of preserved wood, the proposed rule is not expected to have a significant impact on the wood preserving industry. Because most sawmill production is not treated with any sapstain control agent, the proposed rule is also not expected to have a significant impact on the sawmilling industry.

(3) *Employment Impacts.* Two additional tests on model facilities identified as subject to "significant adverse impacts" in the Industry Impact section (above) are used to help assess the potential for facility closures and consequent employment impacts. The capital cost of compliance was compared with annual investment to assess the potential for incremental capital requirements to contribute to firm closures. The annual revenue requirement was compared with the cash from operations to further assess the potential for incremental revenue requirements to contribute to firm closures. Table 19 shows the results of these tests.

Table 19 indicates that the 25 facilities represented by the model facilities incurring corrective action costs are judged to have a higher likelihood of closure than the other facilities. The number of employees in the 25 actual facilities represented by these model facilities is estimated to be between 150 and 200. The potential employment impacts could thus range as high as 200 jobs, if all of the facilities that fail all of these tests close as a result of the proposed rule. Even if that should happen, the balance of the industry is expected to absorb the loss of production from these facilities by expanding production at many other facilities currently operating at less than full capacity. New jobs that may be created at these larger facilities would partially offset the potential employment impact from possible plant closings. Based on these findings, the employment impact of the proposed rule is not considered significant.

TABLE 19.—ADDITIONAL TESTS FOR ECONOMIC IMPACT OF PROPOSED RULE

Model plants	RCRA status	ARR/CFO	CCA/AI	No. plants
Small penta.	Permitted	0.2	9:1	1
Small creosote.	Permitted	0.1	4:1	23
Small penta.	No permit	3.1	9:1	16
Small creosote.	No permit	1.3	4:1	5
Medium creosote.	No permit	0.5	1.6:1	1
Medium penta.	No permit	1.3	5:1	1
Small inorganic.	Permitted	0.1	6:1	184

Criteria for Significantly Impacted: ARR/Cash from Operations (CFO)>0.5 or Compliance Capital Cost/Annual Investment (CCC/AI)>1:1.

4. Limitations

An important limitation on the analysis of potential employment effects is the absence of information on firm assets. If firms have additional

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resources that can be used to help cover compliance costs, this analysis may overestimate the potential economic impact of the proposed rule. The Agency requests additional information on the financial status of the wood preserving industry to refine its analysis of employment effects.

The economic impact analysis described above does not take into account the effects that other regulations may have on the economic performance of regulated entities. For example, corrective action costs for firms that already generate and manage K001 waste are not an incremental cost of today's proposed rule, but may adversely impact the economic performance of the industries. Many facilities that generate K001 could incur corrective action costs at the same time as they incur costs associated with today's proposed rule. The economic impact of corrective action on these firms could be substantial. The cumulative effect of these and other rules is outside the scope of the draft Cost and Economic Impact Analysis.

VI. Regulatory Flexibility Analysis

The Agency is required, under the regulatory Flexibility Act (RFA), to assess whether a substantial number of small businesses are significantly affected by a proposed rule. EPA determines whether a rule will have a "significant economic effect" on small entities based on: The ratio of incremental compliance costs to the value of sales, the ratio of compliance costs to profits, and the number of facility closures that could result from the proposed rule. Based on EPA's guidelines for conducting Regulatory Flexibility Analyses (RFAs), a "substantial number" of small entities was defined to be 20 percent or more of the small businesses in the regulated industry.

The wood preserving industry is characterized by the presence of many small companies. Approximately 45 percent of the companies in the wood preserving industry have fewer than 10 employees, approximately 20 percent have been 10 and 19 employees, and only approximately 35 percent have 20 or more employees. In 1982, nearly 60 percent of the approximately 6,000 domestic sawmills had fewer than 10 employees. Fifteen percent of these facilities had been ten and 19 employees, and approximately 25 percent of the sawmills had 20 or more employees.

EPA guidance for compliance with the RFA provides the Agency with some flexibility in selecting a quantitative cut-off point for defining small entities. In accordance with Agency guidance, EPA based its small entity definition on the distribution of firms by size in the affected industries, and the size at which the adverse economic impacts appear to rise or fall substantially (USEPA, 1982). As discussed below, EPA has examined several possible definitions for small businesses for purposes of the regulatory flexibility analysis and has consulted with the Small Business Administration concerning these definitions. The Agency specifically requests comments on the alternatives evaluated (or any others) for defining small business entities in the wood preserving and surface protection industries.

In accordance with the Regulatory Flexibility Act (RFA), the Agency undertook a preliminary analysis to determine whether the proposed rule will cause a significant impact on small businesses. This analysis has two principal components: (1) Determining whether any small business segments would incur significant impacts as a result of the rule, and (2) determining whether a significant number of small businesses would sustain a significant economic impact.[4] The analysis indicates that, based on the Agency's guidelines for Regulatory Flexibility Analysis, today's rule will significantly affect a substantial number of small entities in the wood preserving and surface protection industry.

A. Methodology

The first component of the RFA analysis is based on the financial performance criteria used in the Economic Impact Analysis reported above, and additional guidance provided in the Regulatory Flexibility Act and EPA policies on implementation of the RFA (Russell, 1982).

Second, the number of small entities projected to incur significant impacts was estimated by assuming that the distribution of small entities within the impacted industry segments is similar to the distribution of small entities in the regulated industries. Readers requiring a more detailed explanation of the methodology that was used are referred to the Cost and Economic Impact Analysis.

B. Results

The Industry Impact Analysis, provided previously, indicates that small wood preserving facilities using pentachlorophenol are expected to incur the greatest adverse economic impacts as a result of the proposed rule. Small creosote and inorganic model wood preserving plants also exceed the ratio tests used in this analysis, and are projected to be significantly affected. Small surface protection facilities that currently use sodium pentachlorophenate for 12 months a year, but are expected to switch to alternative chemicals, also exceed these ratio thresholds, and are expected to be significantly impacted. Accordingly, the Agency has determined that the proposed rule is likely to cause a significant economic impact for a significant fraction of small businesses in the wood preserving industry.

All of these plants, represented by the small model facilities, are susceptible to adverse economic impacts. The Agency's review of the wood preserving industry suggests that there are approximately 232 small wood preserving facilities that would be significantly affected. The Agency concludes that these facilities comprise at least 20 percent and up to 100 percent of the small businesses in the wood preserving industry. By contrast, the Agency estimates that there are 50 to 70 small surface protection plants that use chlorophenolic solutions for surface protection for 12 months a year. The Agency believes these comprise up to 5 percent of the small businesses in the surface protection industry.

C. Conclusions

Historically, the Agency has used a criterion of 20 percent for assessing whether a significant number of small businesses are affected. As a result of this analysis, the Agency has determined that a significant number of the small businesses in the wood preserving industry are likely to incur significant economic impacts as a result of the proposed rule. The 50 to 75 surface protection facilities that may be significantly affected by today's proposed rule represent less than 5 percent of the small businesses in that industry. The Agency has determined that a significant number of the small businesses in the surface protection industry are not likely to incur significant impacts as a result of the proposed rule.

D. Regulatory Options Considered by the Agency

The Agency has considered a number of regulatory options in light of the potential economic impacts of the proposed rule on small businesses. These options are based on the Cost and Economic Impact Analysis summarized in Section V. In particular, the Agency

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[4] For this analysis, small businesses in the wood preserving and sawmilling industries were defined as those with fewer than ten employees.

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solicits comments on the best approach to defining small businesses. The Agency is evaluating whether it is preferable to establish a small business cut-off based on an annual sales threshold or on number of employees. The goal of the annual sales threshold is to establish a true "economic" threshold; however, data upon which to establish such a threshold are not readily available. If alternative regulatory options were made available to small businesses, an employee-based cut-off has clear implications because it may create incentives for firms to lay-off employees in order to avoid compliance with regulatory standards. However, data on number of employees are more readily available. A secondary issue the Agency is considering is whether to establish thresholds for defining small businesses for the entire wood preserving industry, or whether to establish separate thresholds for specific sectors.

EPA conducted the option analysis in order to fulfill its obligation under the Regulatory Flexibility Act. Two of the options examined involve exempting certain small business entities from the requirements for operating hazardous waste drip pads in treated wood storage yards. These options were selected for examination because available information on waste management practices shows that most wood preserving and surface protection facilities already have drip pads in kick-back areas. Most do not have drip pads in treated wood storage yards. Moreover, treated wood storage yards are quite large (many acres) at most facilities. EPA therefore concluded that installation of drip pads in treated wood storage yards would account for a large portion of the compliance costs. The Agency notes that under RCRA, EPA does not normally make regulatory decisions on the basis of economic considerations. EPA therefore believes that options providing exemptions from certain requirements for small business entities in this case would be inconsistent with its statutory mandate under RCRA. As an alternative, EPA considered using a risk-based determination in conjunction with an exemption for small businesses. Under such an option the exemption would be granted based on a consideration of the relative hazard posed by an individual facility.

Of the remaining options, two involve a delay in the effective date of the regulations and the third involves no special provisions for small businesses. All six options are discussed briefly below.

Option 1 is full application of the proposed rule to all wood preserving and surface protection plants, regardless of size. Because this option has the same requirements for all wood preserving facilities, it will provide the greatest environmental benefits. However, this option is expected to cause adverse economic impacts for more small, single preservative wood preserving firms than the other regulatory options. Option 1 is consistent with EPA's RCRA mandate.

Option 2 involves allowing all small wood preserving and surface protection facilities to comply with the proposed rule on a delayed schedule. Under this option, small businesses would be allowed up to 5 years following the effective date of the rules to come into compliance. Although this option does not reduce the economic impact of the rules, EPA believes that the delay may provide time for small businesses to investigate a variety of compliance options and to seek any financial assistance required to fund compliance expenditures. Option 2 is also consistent with RCRA.

Option 3 involves allowing small businesses up to 10 years following the effective date of the rules to come into compliance. This option would provide an even longer period of time to investigate and select compliance alternatives. EPA believes that this 10-year period may be sufficient to allow for developing technological changes or chemical changes to the wood preserving process that may affect compliance costs. Option 3 is consistent with RCRA.

Option 4 would permit firms that use only arsenical formulations to obtain an exemption from the proposed requirement for operating drip pads in treated wood storage yards if they met the definition of small businesses. The agency is considering two approaches to defining small businesses under this option. The definition would apply either to firms with an annual sales of less than $1,170,000 per year, the estimated annual sales level corresponding to the small model arsenic facility developed in the Cost and Economic Impact Analysis; or to firms with less than seven employees, the size of many small facilities that exclusively use arsenic. Option 4 is inconsistent with EPA's authority under RCRA.

Option 5 would permit any small wood preserving firm to obtain an exemption from the proposed requirements for operating drip pads in treated wood storage yards. Option 5 is also inconsistent with EPA's authority under RCRA.

Option 6 would allow small businesses to apply to EPA for an exemption based on a demonstration that the quantities of drippage generated at an individual facility do not exceed an established de minimis level. Under this option, the Agency would need to develop guidance concerning the establishment of de minimis levels, taking into consideration the constituent concentrations in drippage, the size of wood storage yards, the quantities and rates of treated wood production, and a variety of other site-specific factors. While this option has the advantage of being consistent with EPA's RCRA authority, it also has significant disadvantages. EPA would need to conduct studies to develop methods for evaluating drippage rates and establishing de minimis levels. Additionally because the determination would be site-specific, the cost of developing the information required to support an exemption may be prohibitive to small businesses.

There are a number of approaches that can be taken to define small businesses under Options 2, 3, 5, and 6. Approaches based on annual sales are briefly noted below:

a. An annual sales level of $1,230,000, which is the weighted average of sales, for the proportion of small model plants that use each preservative.

b. Annual sales of less than $4,000,000, which would encompass about 65 percent of the industry.

c. An annual sales level for small plants and for those using the specific preservatives, i.e., creosote firms with annual sales less than $1,800,000, pentachlorophenol firms with annual sales less than $810,000 and arsenical firms with annual sales less than $1,170,000.

d. An annual sales level less than the sales level at which firms are projected to meet the criteria for incurring significant adverse economic impacts. Assuming that the economic impact criteria, ARR/Sales and ARR/Pretax Profits, are linearly related to the number of employees at a firm, the cut-off sales levels (at which significant economic impacts are accrued in each segment) would be $3.8 million for firms using creosote, $1.4 million for firms using pentachlorophenol, and $2.0 million for firms using arsenic.

There are a number of factors to consider in evaluating these approaches. The first two approaches are easier to implement—they involve only one cut-off for the whole industry. The third and fourth approaches more reasonably take into account differences in average size and profitability between the three

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segments of the wood preserving industry. In particular, the fourth approach would more equitably confer relief to specific segments of the industry at the point that they incur adverse economic impacts. However, this approach would also result in larger creosote facilities being eligible for an exemption than with the other regulatory options.

The Agency is also considering (solely for meeting the requirements of the Regulatory Flexibility Act) an employee-based cut-off to defining small business. For the most part, these options parallel those for annual sales thresholds and are described below:

a. Firms with ten or fewer employees.

b. Firms with twenty or fewer employees, which would encompass about 65 percent of the industry.

c. Firms with fewer employees than the number of employees in the applicable model plant in the Cost and Economic Impact Analysis, i.e., creosote firms with fewer than ten employees, pentachlorophenol firms with fewer than eight employees, and arsenic firms with fewer than seven employees would be eligible for relief.

d. Firms with fewer employees than the number of employees at model facilities estimated to have economic impacts; i.e., creosote firms with fewer than 19 employees, pentachlorophenol firms with fewer than 12 employees, and arsenic firms with fewer than ten employees.

e. Firms with fewer than 500 employees, an exemption based on the Small Business Adminstration (SBA) definition of small business for the wood preserving industry (500 employees). The SBA definition is based on the size (in number of employees) at which firms can alter the price of preserved wood. This approach would result in over 99 percent of the firms in the industry being eligible for the exemption. This approach does not take into account differences in the typical size of firms in each segment of the industry; nor does it take into account differences in the significance of the economic impacts that may accure to firms in different segments as a result of the proposed rule.

Similar considerations to those noted for the different sales thresholds also apply to approaches based on number of employees. The major exception is that an employee-based cut-off may create incentives to lay off employees. The Agency solicits comment on all the approaches described above or any others that may be more appropriate.

As noted previously, EPA believes that only Options 1, 2, 3, and 6 are consistent with its RCRA mandate and therefore represent feasible regulatory options. As a result, the Agency anticipates that the only relief it can provide to small businesses is a delay in the effective date of the requirements for drip pads in treated wood storage yards. The Agency solicits comments on the options presented here and on any other options.

Based on a more detailed analysis of these options and on comments received, the Agency will continue to evaluate the impacts on the wood preserving industry.

VII. Paperwork Reduction Act

The reporting, notification, or recordkeeping (information) provisions in this rule will be submitted for approval to the Office of Management and Budget (OMB) under section 3504(b) of the Paperwork Reduction Act of 1980, U.S.C. 3501 *et seq.* Any final rule will explain how its reporting, notification, or recordkeeping provisions respond to any OMB or public comments.

VIII. Compliance Procedures and Deadlines

A. Section 3010 Notification

Not later than 90 days from publication of the rule finalizing these listings, all persons who generate, transport, treat, store, or dispose of waste which are covered by today's proposed regulation will be required to notify EPA (for F032 and F033 wastes) or either EPA or a State authorized by EPA to operate the hazards waste program (for F034 or F035 wastes) of their activities pursuant to section 3010 of RCRA. Persons who previously have notified EPA or an authorized State that they generate, transport, treat, store, or dispose of hazardous wastes and have received an identification number (see 40 CFR 262.12, 263.11, and 265.11) need not re-notify. Notification instructions are set forth in 45 FR 12746, February 26, 1980. Persons without EPA identification numbers are prohibited from generating, transporting, treating, storing, or disposing of hazardous wastes.

The Agency views the section 3010 notification requirement to be necessary in this case because it is believed that many persons that manage the wastes proposed for listing today have not previously notified EPA and received an EPA identification number.[5]

B. Compliance Dates

1. F032 and F033

Because HSWA requirements are applicable in authorized States at the same time as in unauthorized states, EPA will regulate F032 and F033 until States are authorized to regulate these wastes. Thus, once these regulations become effective in a final Agency rule, EPA will apply those Federal regulations to these wastes and to their management in both authorized and unauthorized States. Facilities that treat, store, or dispose of F032 and F033, but that have not received a permit pursuant to section 3005 of RCRA and are not operating pursuant to interim status, might be eligible for interim status under HSWA (see section 3005(e)(1)(A)(ii) of RCRA, as amended). In order to operate pursuant to interim status, the eligible facilities will be required to submit a section 3010 notice pursuant to 40 CFR 270.70(a) within 90 days from the publication of the rule finalizing these listings, and will be required to submit a Part A permit application within 6 months of such publication.

Under section 3005(e)(3), within 18 months of such publication, land disposal facilities qualifying for interim status under section 3005 (e)(1)(A)(ii) also will be required to submit a Part B permit application and certify that the facility is in compliance with all applicable ground water monitoring and financial responsibility requirements. If the facility fails to do so, interim status will terminate on that date.

All existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of F032 and F033 and that are currently operating pursuant to interim status under section 3005(e) of RCRA, will be required to file with EPA an amended Part A permit application within 6 months of such publication.

Under current regulations, a hazardous waste management facility that has received a permit pursuant to section 3005 would not be able to treat, store, or dispose of F032 and F033 until a permit modification allowing such activity is approved in accordance with § 270.42. Note that EPA has recently amended the permit modification requirements for newly listed or identified wastes. See 53 FR 37912 *et seq.* (September 28, 1988).

2. F034 and F035

a. Interim status in unauthorized states. Facilities that treat, store, or dispose of F034 and F035 wastes in *unauthorized* States, but that have not received a permit pursuant to section

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[5] Under Solid Waste Disposal Amendments of 1980, (Pub. L. 96–452) EPA was given the option of waiving the notification requirement under section 3010 of RCRA following revision of the section 3001 regulations, at the discretion of the Administrator. Notification is not being waived in this case.

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3005 of RCRA and are not operating pursuant to interim status, might be eligible for interim status under HSWA (see section 3005(e)(1)(A)(ii) of RCRA, as amended). In order to operate pursuant to interim status, the eligible facilities will be required to submit a section 3010 notice pursuant to 40 CFR 270.70(a) within 90 days from the publication of the rule finalizing these listings, and to submit a Part A permit application within 6 months of such publication. Within 18 months of such publication, under section 3005(e)(3), land disposal facilities qualifying for interim status under section 3005(e)(1)(A)(ii) also will be required to submit a Part B permit application and certify that the facility is in compliance with all applicable ground water monitoring and financial responsibility requirements. If the facility fails to do so, interim status will terminate on that date.

All existing hazardous waste management facilities (as defined in 40 CFR 270.2) that treat, store, or dispose of F034 and F035 and that are currently operating pursuant to interim status under section 3005(e) of RCRA, will be required to file with EPA an amended Part A permit application within 6 months of such publication.

Under current regulations, a hazardous waste management facility that has received a permit pursuant to section 3005 would not be able to treat, store, or dispose of F034 and F035 until a permit modification allowing such activity were approved in accordance with § 270.42. Note that EPA has recently finalized amendments to the permit modification requirements for newly listed or identified wastes. See 53 *FR* 37912 et seq. (September 28, 1988).

b. Interim status in authorized states. Until a State is authorized to regulate F034 and F035 (i.e., until F034 and F035 become hazardous waste under authorized State law), no permit requirements would apply and facilities would not need to seek RCRA interim status or a RCRA permit. Any facility treating, storing or disposing of these wastes on or before the effective date of authorization of the State to regulate these wastes under RCRA might qualify for interim status under applicable State law. Note that in order to be no less stringent than the Federal program, the State "in existence" date for determining interim status eligibility could not be after the effective date of EPA's authorization of the State to regulate these wastes. Any eligible existing facility also would be required to provide the required 3010 notification as described above and to provide the State's equivalent of a Part A permit application as required by authorized State law.

Finally, RCRA section 3005(e)(3) or any authorized State analog would apply to land disposal facilities qualifying for State interim status.

3. Drip Pad Permitting and Interim Status Standards

a. Unauthorized states. The drip pad standards would apply in unauthorized States as of the effective date of EPA's final rule adopting these standards. The effective date for small businesses will depend on which, if any, of the regulatory options, discussed above in Section VI.E, is chosen.

b. Authorized states. The standards for permitting drip pads associated with F032 and F033 wastes would be applicable in authorized States in accordance with 40 CFR 264.1(f)(2) and proposed § 265.1(c)(4)(iii), as discussed previously. The standards, as they apply to F034 and F035 wastes, would not apply after Agency publication of the rule, until the State is authorized to regulate these wastes as hazardous (and presumably to implement the drip pad requirements). States could not obtain authorization for these requirements prior to the effective date of EPA's regulations, which, for small businesses, will depend on the adoption of regulatory options specified in Section VI.E. However, States may impose requirements that are more stringent or broader in scope than EPA's regulations; States may choose to impose such standards prior to authorization as a matter of State law.

4. Application of Phasing of Regulations

If EPA selects to phase implementation in regard to small business entities and the Regulatory Flexibility Act, EPA will authorize States choosing not to delay regulation of small businesses but will make the effective date of authorization as it applies to small businesses consistent with the schedule selected for the Federal program.

List of Subjects

40 CFR Part 260

Administrative practice and procedure, Confidential business information, Hazardous materials, Recycling, Reporting and recordkeeping, Waste treatment and disposal.

40 CFR Part 261

Hazardous materials, Waste treatment and disposal, Recycling.

40 CFR Part 262

Administrative practice and procedures, Hazardous materials, Reporting and recordkeeping,

40 CFR Part 264

Hazardous materials, Packing and containers, Reporting requirements, Security measures, Surety bonds, Waste treatment and disposal.

40 CFR Part 265

Air pollution control, Hazardous materials, Packaging and containers, Reporting requirements, Security measures, Surety bonds, Waste treatment and disposal, Water supply.

40 CFR Part 270

Administrative practice and procedures, Air pollution control, Hazardous materials, Reporting requirements, Waste treatment and disposal, Water pollution control, Water supply, Confidential Business Information.

40 CFR Part 271

Administrative practice and procedure, Confidential Business Information, Hazardous materials transportation, Hazardous waste, Indian lands, Intergovernmental relations, Penalties, Reporting and recordkeeping requirements, Water pollution control, Water supply.

40 CFR Part 302

Air pollution control, Chemicals, Hazardous materials, Hazardous materials transportation, Hazardous substances, Intergovernmental relations, Natural resources, Nuclear materials, Pesticides and pests, Radioactive materials, Reporting and recordkeeping requirements, Superfund, Waste treatment and disposal, Water pollution control.

Lee Thomas,
Administrator.
Date: December 23, 1988.

IX. References

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Appendix—Environmental Contamination from Wood Preserving and Surface Protection Wastes

Past mismanagement of the wastes listed in today's notice (F02, F033, F034, and F035) has resulted in significant environmental damage which the Agency has documented extensively. As shown in Table 20, a total of 36 wood preserving and surface protection facilities representing all of the proposed listings are on the National Priority List.

The following examples typify the many cases that EPA has identified regarding environmental contamination. They demonstrate that wastes from wood preserving and surface protection processes are capable of persisting and moving in the environment to reach environmental receptors in potentially harmful concentrations. The Background Document to today's proposal contains further examples of damage cases.

A. Environmental Contamination with Wastes from Pentachlorophenol Wood Preserving Processes

At a facility located in southwestern Montana (that is included on the National Priorities List (NPL)) poles were pressure treated with pentachlorophenol dissolved in diesel oil. Untreated retort condensate was discharged through an unlined ditch to an unlined pit. Ground water, approximately 15 feet below the surface has been found to be contaminated with a floating oil layer that contains 650 ppm pentachlorophenol and 200 ppb 2,3,7,8-TCDD toxic equivalents. This ground water is hydraulically connected to a creek 0.4 miles downgradient from the site. Approximately 49,000 gallons of oil has been recovered from interceptor trenches and recovery wells. The total 2,3,7,8-TCDD toxic equivalent concentration of the recovered oil was 700 ppb. Soils in the process area were contaminated at a depth of 12 to 24 inches with pentachlorophenol (5,250 ppm) and PCDDs and PDCFs (total 2,3,7,8-TCDD equivalent concentration was 20 ppb). Off-site soils were also contaminated, presumably by runoff carrying drippage from contaminated surface soils. Off-site surface soils contained a total 2,3,7,8-TCDD equivalent concentration of 26 ppb. This case clearly demonstrates that unless properly managed on-site, ground water and soil contamination can result from the wastes generated from wood preserving processes using pentachlorophenol.

Contamination of residential drinking water wells with pentachlorophenol, PCDDs, and PCDFs has also been demonstrated at a 50 acre site in southern Montana. Wood preserving operations at this facility began in the late 1940s. Pentachlorophenol dissolved in oil was applied to wood by pressure and non-pressure methods (the site was added to the NPL in 1984). In the past, the facility discharged pentachlorophenol-contaminated ground water to an adjacent creek through a ditch. Soils and shallow ground water were contaminated via leaking pipes and a deteriorated wastewater sump. Two contaminant plumes have been identified. The first plume consists of pentachlorophenol dissolved in oil that floats on top of the water table. This plume oozed from the ground in a pasture downgradient from the facility. There is also a plume of pentachlorophenol dissolved in ground water that has contaminated two drinking water wells on neighboring property with PCDDs and PCDFs. One well contained 0.8 ppt and the other 2 ppt total 2,3,7,8-TCDD toxic equivalents.

B. Environmental Contamination with Wastes from Pentachlorophenate Surface Protection Processes

During 1986 and 1987, Environment Canada conducted a 4-month field study at five sawmills and two lumber export terminals (Krahn, Shrimpton, and Glue, 1987). The object of the study was to measure the extent to which rainfall could be contaminated with chlorophenols leached from treated lumber. The studied sites represented typical lumber handling and treatment methods including dip tanks and low pressure and high pressure spray systems. Leachate dripping directly from the wood and yard was analyzed for 2,3,4,6-tetrachlorophenol and pentachlorophenol.

It was found that leaching from treated lumber began after 1.0 to 1.5 mm of continuous rainfall. Dip treated lumber leached up to 160 mg/1 and generated drippage averaging 0.3 to 0.5 mg/1 total chlorophenols. Low pressure sprayed lumber leached up to 580 mg/1 total chlorophenols. High pressure sprayed lumber leached up to 9.8 mg/1 and generated average yard runoff with up to 2 mg/1 total chlorophenols. Chlorophenols were found to leach from treated lumber under all conditions of exposure to rainfall. Conditions studied included up to 8 days of drying, 13 consecutive days of rainfall and 18 days of alternating wet and dry periods. This study documents that drippage of preservative formulation from surface protected wood and preservative is washed off treated wood by precipitation, and, thus, can migrate into the environment.

A sawmill located in northwest Oregon documents the contamination of on-site soils, ground water, and surface water sediments with chlorophenols, PCDDs, and PCDFs. In 1983, the Oregon Department of Environmental Quality detected chlorophenols in water samples collected near the mill. The chlorophenols apparently derived from the application of an anti-sapstain (surface protection) solution containing tetrachlorophenol and pentachlorophenol to lumber intended for export. At this mill, a continuous processing line is used to dip-treat cut lumber. A roller system moves bundles of lumber to the dip tank, the wood is submerged for less than a minute, then allowed to drip into the dip tank for a few minutes. Next, excess preservative is mechanically shaken off the lumber and the wood transported to a storage yard.

Soil samples collected in 1983 from the dip tank area were found to contain 940 ppm total chlorophenols (pentachlorophenol plus tetrachlorophenols) at the surface. In the path over which the treated lumber was transported to the storage yard, the total chlorophenols concentration was 2,520 ppm

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at a depth of 6 to 8 inches. Soil in the treated wood storage yard was also contaminated. At a depth of three feet the total chlorophenol concentration was 1.4 ppm.

Drainage from the dip tank area to an on-site creek contained 0.3 ppm pentachlorophenol. Ground water near the dip tank was found to contain 0.1 ppm total chlorophenol, demonstrating that drips and spills from surface protection processes can contaminate surface water and ground water.

Samples collected during 1985 were analyzed for PCDDs and PCDFs as well as chlorophenols. Sediment collected from the on-site creek near the dip tank contained 2 ppt 2,3,7,8-TCDD. The total 2,3,7,8-TCDD equivalent concentration was 500 ppt. The average toxic equivalent concentration found in three other creek sediment samples was 300 ppt. This contamination is attributed to runoff from spills and drips of chlorophenate preservative solution near the dip-treating area. Soil that received drippage from the paved treated wood storage year was also contaminated. The concentration of total chlorophenols was 63 ppm. The total 2,3,7,8-TCDD equivalent concentration was 4,000 ppt (4 ppb).

Contamination of on-site soils with PCDDs and PCDFs was also documented in a study conducted by the California State Water Resources Control Board. Soil samples were collected in the area of treatment operations at three northern-California sawmills. Presumably, these soils were contaminated by spills, leaks and especially drippage from lumber dipping operations. Concentrations of up to 10,100 ppm total chlorophenols (pentachlorophenol and tetrachlorophenol) were measured in the soil. Tetrachlorodibenzo-*p*-dioxin was not measured above the analytical detection limits, but all other PCDD and PCDE homologues were detected. The maximum total 2,3,7,8-TCDD toxic equivalent concentration was 40 ppb.

C. Environmental Contamination with Wastes from Creosote Wood Preserving Processes

The contamination of ground water, surface water and sediments, and on-site soils with toxic constituents from creosote wood preserving wastes has been demonstrated by a facility located in southeastern Wyoming that was added to the NPL in 1982. The facility began operations in the 1880s, and has been treating railroad ties with creosote since 1928. The facility is located on the flood plain of a river used for irrigation and recreation. Wood preserving wastewaters were disposed of in unlined surface impoundments. Sludges that were cleaned out of the wood treating retorts were buried in the porous alluvial soils on which the facility was built.

As a result of past operating and waste disposal practices, it is estimated that 250,000 cubic yards of soil are saturated with 5 million gallons of oily material. The contamination has attained greatest depth around the treating area, surface impoundments and buried waste. The oily contamination in the alluvium is bordered by a fringe of contamination dissovled in gound water, which extends into the bebrock. Measured ground water concentrations of contaminants include 100 ug/1 fluoranthene and 1,400 ug/1 pyrene, compounds that are major constituents of creosote. Free oil also was observed discharging from the saturated alluvium to the river and creosote constituents were measured in river water and sediments.

A facility located in northwestern Ohio also demonstrates the contamination of ground water and surface soils with creosote constituents. Wood has been treated with creosote at this facility since the early 1900s. Process wastes and wastewater treatment residuals (listed waste K001) were disposed of in at least one unlined sludge disposal pit, approximately 13 feet deep. At a depth of 25 feet, ground water in a monitoring well installed adjacent to this pit was contaminated with 71 mg/l anthracene, 58 mg/l naphthalene, 24 mg/l pyrene and other compounds which are major constituents of creosote. The depth at which this contamination was detected indicates that the creosote constituents are migrating through the blue-clay soil that underlies the sludge disposal pit. The volatile organic compounds benzene, toluene, and ethylbenzene were also measured in the ground water, at concentrations of 3 mg/l, 0.6 mg/l and 0.3 mg/1, respectively.

At this same facility, creosote-treated wood was stored on-site in a 7 acre storage yard. Soil from a low area in which drainage from the treated wood storage yard collected was sampled and analyzed. Pyrene (230 mg/kg), chrysene plus benz(a)anthracene (120 mg/l), and fluoranthene (110 mg/kg) were detected, along with other creosote constituents, indicating that creosote that had dripped from treated wood was carried out of the storage yard by surface runoff.

D. Environmental Contamination with Wastes from Inorganic Wood Preserving processes

Contamination of ground water has been demonstrated at a California facility where on-site soils and surface drippage with arsenic and chromium from wood preserving wastes occurred (The facility was added to the NPL in 1982). Wood was treated on an 18 acre site in the San Joaquin Valley, California, since 1936. At various times, the facility used pentachlorophenol, FCAP, CCA, and copper-8-quinolinate. Excess preservative that dripped from treated wood was allowed to run into drainage and percolation ditches. Wastewater was allowed to drain into dry wells, while retort sludges and other wastes were placed in a 50-foot diameter unlined pond and in a sludge pit with hydraulic conductivity with ground water. These waste management practices resulted in contamination of ground water and soils on-site. Arsenic and chromium have been measured in the ground water at concentrations of 0.05 and 9 mg/1, respectively, compared to maximum contamination levels (MCLs) of 0.05 mg/l for each metal. The contaiminated aquifer is used as drinking water by 10,000 people. Surface soil concentrations range to 9,800 mg/kg arsenic and 10,100 mg/kg of total chromium. At a depth of 10 to 20 feet, both arsenic and chromium are present at up to 4 mp/kg. The arsenic concentration measured in standing water in the treatment area was 10 mg/l and chromium was present at 0.8 mg/l, demonstrating that soil contaminants can be transferred to the standing water.

Vineyards that border two sides of the site have received runoff contaminated with drippage and other solid wastes.

Data from another case demonstrate that contaminated runoff from storage yards used to hold wood treated with CCA can be contaminated with drippage containing arsenic and chromium. The facility, located in northwestern Alabama, was sampled in 1985 when CCA was the only preservative used. Although no wastewater was generated from the actual CCA treating process, runoff from the yard used to store CCA-treated wood was collected in a drainage pond. No water from the tank or retort area, tracks in front of the retort or any wastewater treatment system drained into the pond. Water in the pond contained 4 mg/l arsenic and 0.79 mg/l chromium. Pond sediments contained 1,200 mg/kg arsenic and 1,900 mg/kg of chromium, demonstrating that metal contaminants can be washed off treated wood and/or the soil on which inorganic preservative has dripped. Ground water near the drainage pond was not sampled. However, ground water 71 feet below an evaporation pond that had been used to treat wastewater from a discontinued steam conditioning and pentachlorophenol treatment process, contained chromium at a concentration slightly higher than the drinking water standard of 0.05 mg/l. Presumably the metal contaminants originated from pentachlorophenol wastewater cross-contaminated with chromium and arsenic that had infiltrated into the ground water below the evaporation pond.

Several cases of off-site contamination of ground water have been documented. A surface impoundment (that had been used to store process wastes) was closed in 1977 by draining the pond, spreading its contents over the site, mixing the waste with soil and placing the waste mixture in the impoundment. A wet-weather spring sediment sample showed 2 mg/kg arsenic and 12 mg/kg chromium, further evidence of ground-water contamination.

At a facility located in central South Carolina (also on the NPL), FCAP and CCA wood preserving solutions dripped onto the ground in the loading yard and drip shed over 20 years of operation. The State reported that high levels of chromium were detected in many neighboring private wells, at concentrations up to 80 mg/l.

At a small site outside of Baltimore, Maryland, tank overflows have resulted in the overland flow of CCA treating solution. The facility had a surfaced drip pad which did not contain all preservative dripping from treated wood, and allowed drippage to overflow onto the ground. As a result, surface soils are contaminated with up to 5,700 mg/kg arsenic and 3,100 mg/kg chromium. Ground water on-site is also contaminated (800 mg/l arsenic, 130 mg/l chromium) and high chromium concentrations were reported in a neighbor's well.

As a 7.5 acre site one-half mile from the Russian River in northern California (added

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to the NPL in 1982), soils and ground water on-site were severely contaminated as a result of past operating practices, including spills and leaks from the facility's CCA preservative and wastewater recycling system. Concentrations of chromium in ground water near the process area reached 120 mg/l. Ground water contamination migrated off-site. Contaminant levels in the plume were 0.5 mg/l arsenic and 0.6 mg/l chromium, compared to MCLs of 0.05 mg/l for both metals. Ground water in the area supplies domestic, agricultural, and industrial users.

Environmental contamination from wood preserving operations that use inorganic preservatives can be long-lasting. This is documented by a site in Texas on the Texas-Arkansas border. A wood preserving facility operated on this 61 acre site from 1939 to 1961 and used pentachlorophenol, creosote, and CCA. Wood preserving wastes were stored in a surface impoundment on the site where ground water is 10 feet below the surface. In 1984, a housing development and a sand and gravel pit occupied the site. A sediment sample from a creek adjacent to the site contained 4 mg/kg arsenic and 3 mg/kg chromium, presumably contaminated by drippage carried by surface runoff. Ground water leachate collected in the quarry area contained 440 mg/l arsenic (chromium concentration was not reported), 23 years after wood preserving operations on the site were discontinued.

For the reasons set out in the preamble, 40 CFR Parts 260, 261, 262, 264, 265, 270, 271, and 302 are proposed to be amended as follows:

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

1. The authority citation for Part 260 continues to read as follows:

Authority: 42 USC 6905, 6912(1), 6921 through 6927, 6930, 6934, 6935, 6937, 6938, and 6939.

2. Section 260.10 is amended by adding the definition of "Drip Pad", in alphabetical order, as follows:

§ 260.10 Definitions.

* * * * *

"Drip Pad" is a curbed, impermeable base installed to assist collection of drippage and accumulated precipitation in drip or kick-back areas at wood preserving facilities or in treated wood storage yards.

* * * * *

PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

3. The authority citation for Part 261 continues to read as follows:

Authority: 42 USC 6905, 6912(a), 6921, 6922, and 6938.

4. Section 261.31 is amended by adding the following hazardous waste listing in alphanumeric order to read as follows:

§ 261.31 Hazardous wastes from non-specific sources.

* * * * *

Industry and EPA hazardous waste No.	Hazardous waste	Hazard code
*	* * * * *	
F032	Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes at facilities that currently use or have previously used chlorophenolic formulations (except wastes from processes that have complied with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
F033	Wastewaters, process residuals, pretectant drippage, and discarded spent formulations from wood surface protection processes at facilities that currently use or have previously used chlorophenolic formulations (except wastes from processes that have complied with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations).	(T)
F034	Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes using creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
F035	Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes using inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	(T)
*	* * * * *	

5. Section 261.35 is added to read as follows:

§ 261.35 Equipment cleaning or replacement standards for hazardous wastes listed in §§ 261.31 and 261.32 of this chapter.

(a) *Applicability.* Equipment cleaning or replacement standards are applicable to generators of the listed hazardous wastes F032 and F033. Wastes from wood preserving and surface protection facilities generated in processes that do not resume or initiate use of chlorophenolic formulations will not meet the listing definition of F032 and F033, respectively, once the conditions in § 261.35 (b) through (f) are met. These wastes may, however, continue to meet another hazardous waste listing description or may exhibit one or more of the hazardous waste characteristics.

(b) *Equipment cleaning or replacement performance standard.* The owner or operator must clean or replace all equipment that may have come into contact with chlorophenolic formulations or constituents thereof, in a manner that:

(1) Minimizes or eliminates the escape of hazardous waste, hazardous constituents, leachate, contaminated drippage, or hazardous waste decomposition products to the ground and surface waters, and to the atmosphere, and

(2) Complies with the equipment cleaning or replacement requirements of this section.

(c) *Equipment cleaning or replacement requirements.* Generators must either clean or replace all process equipment that may have come into contact with chlorophenolic formulations or constituents thereof, including, but not limited to, treatment cylinders, sumps, tanks, piping systems, drip pads, fork lifts, and trams by conducting the following activities:

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(1) The generator must prepare and sign a written equipment cleaning or replacement plan that describes the equipment to be cleaned or replaced, how the equipment will be cleaned or replaced in accordance with § 261.35(b) and (c), and the appropriate solvent chosen for use in § 261.35(c)(3);

(2) The generator must remove all visible residues, including free and attached residues, from process equipment;

(3) The generator must rinse the process equipment with an appropriate solvent until dioxins and dibenzofurans are not detected in the final solvent rinse when tested in accordance with the testing requirements of § 261.35(e); and

(4) The generator must manage all residues from the cleaning process and any discarded equipment as F032 (for wood preserving operations) or F033 (for surface protection operations).

(d) *Previous equipment cleaning or replacement provision.* Generators that can document previous equipment cleaning or replacement which was performed in accordance with the requirements in § 261.35(c) and which occurred after a change in preservative or surface protectant may use this documentation to fulfill the equipment cleaning or replacement requirements in § 261.35(c). Wastes from wood preserving and surface protection facilities generated in processes that do not resume or initiate use of chlorophenolic formulations, for which generators submit information from previous equipment cleaning or replacement activities, will no longer meet the listing definition of F032 or F033 provided that the conditions listed in paragraphs (d) (1), (2), and (3) of this section have been met and provided that the generator does not resume or initiate use of chlorophenolic formulations. The wastes may, however, continue to meet another hazardous waste listing description or may exhibit one or more of the hazardous waste characteristics.

(1) The generator must submit to the Regional Administrator the required documentation together with the following statement signed by the generator or his authorized representative:

> I certify under penalty of law that all process equipment required to be cleaned or replaced under 40 CFR 261.35 was cleaned or replaced as represented in the accompanying materials. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

(2) The Regional Administrator finds, after a review of the material provided by the generator, that the procedures used for equipment cleaning or replacement meet the requirements of § 261.35 (b) and (c), and

(3) The Regional Administrator notifies the generator, in writing, of this finding.

(e) Testing and Documentation Requirements.

(1) Any person seeking to meet the equipment cleaning requirements of § 261.35(c) must test the rinsate from the final solvent rinse and demonstrate that dioxins and furans are not detected when tested according to the method specified in § 261.35(e)(2).

(2) Dioxin and dibenzofuran concentrations must be determined using SW-846 Method 8290.

(3) Generators seeking to meet the equipment cleaning or replacement requirements of § 261.35 (c) and (d) must collect the following information for submission to the Regional Administrator:

(i) The name and address of the facility;

(ii) Formulations previously used and the date on which their use ceased in each process at the facility;

(iii) For F033, a statement certifying whether the facility currently uses a surface protection formulation that has no listed hazardous wastes associated with it;

(iv) Formulations currently used in each process at the facility;

(v) The equipment cleaning or replacement plan;

(vi) The name and address of the person conducting any cleaning operations required under § 261.35(c);

(vii) The dates of the cleaning or replacement;

(viii) The name and address of the laboratory facility performing the sampling and testing;

(ix) The dates of sampling and testing;

(x) A description of the sample handling and preparation techniques, including techniques used for extraction, containerization, preservation, and chain of custody of the samples;

(xi) A description of the tests performed, the date the tests were performed, and the results of those tests;

(xii) The name and model numbers of the instrument used in performing the tests; and

(xiii) QA/QC documentation.

(f) Notification, Review, and Approval.

(1) Generators intending to use the equipment cleaning or replacement procedures so that their wastes do not meet the listing description of F032 or F033 must notify the Regional Administrator 30 days prior to equipment cleaning or replacement.

(2) Within 30 days following completion of all equipment cleaning or replacement activities, generators must submit to the Regional Administrator copies of all information required under § 261.35(e), a copy of the equipment cleaning and replacement plan required under § 261.35(c)(1), and the following statements signed by the generator or his authorized representative:

> I certify under penalty of law that all process equipment required to be cleaned or replaced under 40 CFR 261.35 was cleaned or replaced in accordance with the requirements of 40 CFR 261.35. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

(3) The Regional Administrator will review the information provided to determine whether the generator has complied with the requirements of § 261.35 (b) and (c).

(4) In the event that the Regional Administrator provides written notification of a tentative determination that the requirements of § 261.35 (b) and (c) have not been met, the generator may provide any appropriate additional information addressing the basis for the tentative determination within 30 days of receipt of the written notification.

(5) Within 30 days following receipt of additional information from the generator, the Regional Administrator will provide written notification of his final determination.

(6) Upon issuance of a final determination that the requirements of § 261.35 (b) and (c) have been met, the subject wastes will be considered to no longer meet the listing descriptions of F032 or F033, provided that the generator does not resume or initiate use of chlorophenolic formulations. The waste will continue to be regulated hazardous waste if it meets another listing description or exhibits one or more of the characteristics of hazardous waste.

Appendix III—[Amended]

6. In Part 261, Appendix III, Table 1 is amended by adding the following compound in alphabetical order as follows:

TABLE 1—ANALYSIS METHODS FOR ORGANIC CHEMICALS CONTAINED IN SW-846

Compound	Method numbers
* * * * *	
Benzo(k)fluoranthene	8100, 8250, 8270, 8310
* * * * *	

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7. In Part 261, Appendix VII is amended by adding the following waste streams in alphanumeric order as follows:

Appendix VII—Basis For Listing Hazardous Waste

EPA hazardous waste No.	Hazardous constituents for which listed
* * *	* *
F032	Benz(a)anthracene, benzo(a)pyrene, dibenz(a,h)-anthracene, indeno(1,2,3-cd)pyrene, pentachlorophenol, arsenic, chromium, tetra-, penta-, hexa-, heptachlorodibenzo-p-dioxins, tetra-, penta-, hexa-, heptachlorodibenzofurans.
F033	Pentachlorophenol, 2,3,4,6-tetrachlorophenol, 2,4,6-trichlorophenol, tetra-, penta-, hexa-, heptachlorodibenzo-p-dioxins, tetra-, penta-, hexa-, heptachlorodibenzofurans.
F034	Benz(a)anthracene, benzo(k)fluoranthene, benzo(a)pyrene, dibenz(a,h)anthracene, indeno(1,2,3-cd)pyrene, naphthalene, arsenic, chromium.
F035	Arsenic, chromium, lead.
* * *	* *

8. In Part 261, Appendix VIII is amended by adding the following hazardous constituents in alphabetical order as follows:

Appendix VIII—Hazardous Constituents

Common name	Chemical abstracts name	Chemical abstracts No.
* *	*	* *
Benzo(k)fluoranthene	Same	207-08-9
* *	*	* *
Heptachlorodibenzofurans.		
Heptachlorodibenzo-p-dioxins.		
* *	*	* *

PART 262—STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE

9. The authority citation for Part 262 continues to read as follows:

Authority: 42 U.S.C. 6906, 6912, 6922, 6924, 6925, and 6937.

10. Section 262.34 paragraph (a)(1) is revised to read as follows:

§ 262.34 Accumulation time.

(a) * * *

(1) The waste is placed in containers and the generator complies with Subpart I of 40 CFR Part 265, or the waste is placed in tanks and the generator complies with Subpart J or 40 CFR Part 265, except § 265.197(c), and § 265.200, or the waste is placed on drip pads and the generator complies with Subpart T of 40 CFR Part 265. In addition, such a generator is exempt from all the requirements of Subparts G and H of 40 CFR Part 265, except for §§ 265.111 and 265.114.

* * * * *

PART 264—STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

12. The authority citation for Part 264 continues to read as follows:

Authority: Secs. 1006, 2002, 3004, and 3005 of the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, and 6925).

13. The table of contents for Part 264 is amended to add Subpart T and §§ 264.570, 264.571, 264.572, 264.573, and 264.574 as follows:

* * * * *

Subpart T—Drip Pads

Sec.

14. Part 264 is amended by adding Subpart T as follows:

Subpart T—Drip Pads

§ 264.570 Applicability.

The requirements of this Subpart apply to owners and operators of facilities that use drip pads to assist collection, storage, or treatment of treated wood drippage that meets the listing description of Hazardous Waste Numbers F032, F033, F034, or F035 of 40 CFR 261.31.

§ 264.571 Containment.

Drip pads must meet the following requirements:

(a) Drip pads must be constructed of a curbed base having an impermeable surface capable of containing drippage and accumulated precipitation while routed to an associated collection area or device (system);

(b) Drip pads must be maintained such that they remain free of cracks, corrosion, or other deterioration that could cause hazardous waste to leak from the drip pad;

(c) The drip pad and associated collection system must be designed and operated to collect and drain liquid resulting from drippage or precipitation in order to prevent run-off; and must be designed and maintained so as to be capable of containing precipitation from a 25-year/24-hour storm event if exposed to rainfall;

(d) Run-on onto the drip pad and associated collection system must be prevented unless the system has sufficient excess capacity to contain any run-on that might enter the system; and

(e) Drippage and accumulated precipitation must be removed from the associated collection system as necessary to prevent overflow onto the drip pad.

(f) As specified in the permit, if the owner or operator detects a condition that could lead to a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery, or the pad must be removed from service.

(Note: See § 264.571(f) for remedial action required if deterioration or leakage is detected.)

§ 264.572 General operating requirement.

Drip pads must be operated and maintained in a manner to prevent tracking of hazardous waste or hazardous waste constituents off the drip pad by personnel or equipment.

§ 264.573 Inspections.

Drip pads must be inspected thoroughly for visual signs of deterioration or cracking. Facility inspection programs must involve inspection of the entire drip pad surface at least weekly.

(Note: See § 264.571(f) for remedial action required if deterioration or leakage is detected.)

§ 264.574 Closure.

At closure, all hazardous waste and hazardous waste residues must be removed from the drip pad. The pad and any soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

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PART 265—INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES

15. The authority citation for Part 265 remains as follows:

Authority: Secs. 1006, 2002(a), 3004, 3005, and 3015 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act of 1976, as amended (42 U.S.C. 6905, 6912(a), 6924, 6925, and 6935).

15. The table of contents for Part 265 is amended by adding Subpart T consisting of §§ 265.440, 265.441, 265.442, 265.443 and 265.444 as follows:

Subpart T—Drip Pads

Sec.

16. Section 265.1 is amended to add paragraph (c)(4)(iii), to read as follows:

§ 265.1 Purpose, scope, and applicability.

(c) * * *

(4) * * *

(iii) To a person who treats, stores, or disposes of hazardous waste in a State authorized under Subpart A or B of Part 271 of this chapter at a facility which was not covered by standards under this part when the State obtained authorization and for which EPA promulgates standards under this part after the State is authorized. This paragraph will apply only until the State is authorized to implement interim status standards for such facilities under Subpart A of Part 271 of this chapter.

17. Part 265 is amended by adding Subpart T as follows:

SUBPART T—DRIP PADS

§ 265.440 Applicability.

The requirements of this Subpart apply to owners and operators of facilities that use drip pads to assist collection, storage, or treatment of treated wood drippage that meets the listing description of Hazardous Waste Numbers F032, F033, F034, or F035, of § 261.32 of this chapter.

§ 265.441 Containment.

Drip pads must meet the following requirements:

(a) Drip pads must be constructed of a curbed base having an impermeable surface capable of containing drippage and accumulated precipitation while routed to an associated collection area or device (system);

(b) Drip pads must be maintained such that they remain free of cracks, corrosion, or other deterioration that could cause hazardous waste to leak from the drip pad;

(c) The drip pad and associated collection system must be designed and operated to collect and drain liquid resulting from drippage or precipitation in order to prevent run-off; and must be designed and maintained so as to be capable of containing precipitation from a 25-year/24-hour storm event if exposed to rainfall;

(d) Run-on onto the drip pad and associated collection system must be prevented unless the system has sufficient excess capacity to contain any run-on that might enter the system; and

(e) Drippage and accumulated precipitation must be removed from the associated collection system as necessary to prevent overflow onto the drip pad.

(f) If the owner or operator detects a condition that could lead to a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery or the pad must be removed from service.

§ 265.442 General operating requirement.

Drip pads must be operated and maintained in a manner to prevent tracking of hazardous waste or hazardous waste constituents off the drip pad by personnel or equipment.

§ 265.443 Inspections.

Drip pads must be inspected thoroughly for visual signs of deterioration or cracking. Facility inspection programs must involve inspection of the entire drip pad surface at least weekly.

(Note: See § 265.342(f) for remedial action required if deterioration or leakage is detected.)

§ 265.444 Closure

At closure, all hazardous waste and hazardous waste residues must be removed from the drip pad. The pad and any soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

18. The authority citation for Part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6925, 6927, 6939, and 6974.

19. Subpart B of Part 270 is amended by adding § 270.22 to read as follows:

§ 270.22 Special Part B information requirements for drip pads.

Except as otherwise provided by § 264.1 of this chapter, owners and operators of hazardous waste treatment, storage, or disposal facilities that collect, store, or treat hazardous waste on drip pads must provide the following additional information:

(a) A description of the drip pad and associated collection system sufficient to demonstrate compliance with the requirements of §§ 264.353 and 264.354. This information must include the following at a minimum:

(1) Basic design parameters, dimensions, and construction materials.

(2) How the design promotes collection and drainage of drippage and materials mixed with drippage to an associated collection area or device (system).

(3) The capacity of the drip pad and associated collection system.

(4) For drip pads and associated collection systems exposed to precipitation, a demonstration that the design capacity of the drip pad and associated collection system is capable of containing the precipitation from a 25 year/24 hour storm event.

(5) For drip pads and associated collection systems protected from precipitation, a description of the structures or structure that will provide protection from precipitation, including basic design parameters, dimensions, and construction materials.

(6) A description of structures that will prevent run-on to the drip pad and associated collection system or a demonstration that the capacity is sufficient to contain any run-on that might enter the drip pad or collection system.

(7) The interval at which drippage and other materials will be removed from the associated collection system and a statement demonstrating that the interval will be sufficient to prevent overflow onto the drip pad.

(b) A description of operating practices and procedures that will be followed to ensure that hazardous waste or waste constituents are not tracked off the drip pad by personnel or equipment.

(c) A plan demonstrating how the owner or operator will ensure that all portions of the drip pad are inspected weekly for signs of deterioration or cracking, including provisions for moving any treated wood that is stored on a pad for more than one week.

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PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE MANAGEMENT PROGRAMS

20. The authority citation for Part 271 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), and 6926.

§ 271.1 [Amended]

21. Section 271.1(j) is amended by adding the following entry to Table 1 in chronological order by date of publication:

TABLE 1.—REGULATIONS IMPLEMENTING THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Promulgation date	Title regulation	Federal Register reference	Effective date
*	*	* *	*
[Insert date of publication].	The listing of wastes from the wood preserving and surface protection processes. [2].	xx *FR* xx......	[Insert effective date.]
*	*	* *	*

* * * * *

[2] These regulations implement HSWA only to the extent that they apply to the listing of Hazardous Wastes Nos. F032 and F033 and the equipment cleaning and replacement procedures. Listings of Hazardous Waste Nos. F034 and F035, test methods for benzo(k)fluoranthene, and technical standards for drip pads do not implement HSWA.

PART 302—DESIGNATION, REPORTABLE QUANTITIES, AND NOTIFICATION

22. The authority citation for Part 302 continues to read as follows:

Authority: Sec. 102 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9602; secs. 311 and 501(a) of the Federal Water Pollution Control Act, 33 U.S.C. 1321 and 1361.

§ 302.4 [Amended]

23. In § 302.4, amend Table 302.4 by adding the waste streams F032, F033, F034, and F035.

(a) * * *

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TABLE 302.4—LIST OF HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES

[See footnotes at end of table 302.4]

Hazardous substance	CASRN	Regulatory synonyms	Statutory			Final RQ	
			RQ	Code	RCRA waste number	Category	Pounds (Kg)
* * * * * * *							
F032 Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes at facilities that currently use or have previously used chlorophonolic formulations (except wastes from processes that have compiled with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.			*	4	F032	X	1 (0.454)
F033 Wastewaters, process residuals, protectant drippage, and discarded spent formulations from wood surface protection processes at facilities that currently use or have previously used chlorophenolic formulations (except wastes from processes that have compiled with the cleaning or replacement procedures set forth in § 261.35 and do not resume or initiate use of chlorophenolic formulations).			10	4	F033	X	1 (0.454)
F034 Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes that currently use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.			1 *	4	F034	X	1 (0.454)
F035 Wastewaters, process residuals, preservative drippage, and discarded spent formulations from wood preserving processes using inorganic preservatives containing arsenic or chromium. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.			1 *	4	F035	X	1 (0.454)

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ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 261

[SW-FRL-3500-6]

Hazardous Waste Management System; Identification and Listing of Hazardous Waste; Tentative Petition Denial

AGENCY: Environmental Protection Agency.

ACTION: Tenative determination to deny petition for rulemaking; request for comments.

SUMMARY: The U.S. Environmental Protection Agency (EPA or Agency) today is issuing a tentative determination to deny a petition from the American Wood Preservers Institute (AWPI), to: (1) Reconsider the Agency's interpretation that EPA hazardous waste K001 may form from application of wood preserving wastewaters to spray irrigation fields and (2) more clearly define K001 by specifying the concentrations of listing constituents that identify a wood preserving wastewater treatment sludge as K001. If EPA finds that K001 can form in spray irrigation fields, the petitioner requests that owners or operators of such facilities be given six months from the date of EPA's response to comply with the regulations. EPA also has determined tentatively to deny this request. The Agency has, however, provided in this **Federal Register** notice a description of how EPA Hazardous Waste K001 applies to spray irrigation fields. This guidance is intended to provide additional assistance to generators in indentification of K001.

The Agency bases today's tentative determination to deny the petition on (1) the listing description, (2) the information provided in the docket supporting the K001 listing and (3) EPA's examination of the data submitted by the petitioner, to support their claim that spray irrigation fields used for the land treatment of wood preserving wastewaters do not generate wastewater treatment sludges and that any wastes that are so generated do not contain significant concentrations of the constituents of concern specified for K001 in 40 CFR Part 261, Appendix VII. It is the Agency's tentative determination that the K001 Background Document and the data submitted by the petitioner support the conclusion that wastewater treatment sludges that meet the K001 listing description may be generated, treated or otherwise managed in spray irrigation fields. Therefore, the Agency believes that the K001 listing applies to sludge that forms in spray irrigation fields used for the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol. Further, the Agency believes it provided adequate notice to wood preservers who use spray irrigation fields of the description of K001 by publication of a notice of the listing in the **Federal Register** and by providing opportunities for public comment on the listing. For this reason, the Agency does not propose to give these facilities additional time to come into compliance with RCRA regulations. Accordingly, the Agency tentatively denies the AWPI petition.