

US EPA ARCHIVE DOCUMENT

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 264, 265, 268, and 271

[OSW-FR-88-005; FRL-3300-2]

Land Disposal Restrictions for Restrictions for First Third of Scheduled Wastes

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) is today proposing its approach to implementing the congressionally mandated prohibitions on land disposal of hazardous wastes listed in 40 CFR 268.10. These actions are responsive to amendments to the Resource Conservation and Recovery Act (RCRA), enacted in the Hazardous and Solid Waste Amendments (HSWA) of 1984.

Today's notice proposes specific treatment standards and effective dates for some of the so-called "First Third" wastes. Additionally, the Agency is proposing its approach to implementing the land disposal restrictions provisions for those First Third wastes for which a treatment standard is not set. Also addressed in today's notice are the Agency's proposed modifications to the "no migration" petition process.

DATE: Comments on this proposed rule must be submitted on or before May 23, 1988.

ADDRESSES: The public must send an original and two copies of their comments to EPA RCRA Docket (S-212) (WH-562), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. Place the Docket Number F-88-LDR7-FFFFF on your comments. The OSW docket is located in the EPA RCRA Docket Room (sub-basement), 401 M Street SW., Washington, DC 20460. The docket is open from 9:00 to 4:00, Monday through Friday, except for public holidays. To review docket materials, the public must make an appointment by calling (202) 475-9327. The public may copy a maximum of 50 pages from any regulatory document at no cost. Additional copies cost \$.20 per page.

FOR FURTHER INFORMATION CONTACT: For general information, contact Stephen Weil, or Mitch Kidwell, Office of Solid Waste (WH-562B), U.S.

Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-4770. For specific information on BDAT/treatment standards, contact Jim Berlow, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-7917. For specific information on capacity determinations/national variances, contact Jo-Ann Bassi, or Linda Malcolm, Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460, (202) 382-7917.

SUPPLEMENTARY INFORMATION:

Outline

I. Background

A. Brief Summary of the Hazardous and Solid Waste Amendments of 1984 (HSWA)

1. Solvents and Dioxins
2. California List Wastes
3. Scheduled Wastes
4. Newly Identified and Listed Wastes

B. Summary of the Land Disposal Restrictions Framework

1. Regulatory Framework
2. Applicability
3. Development of § 3004(m) Treatment Standards
4. Application of the Toxicity Characteristic Leaching Procedures (TCLP)
5. Determination of Alternative Capacity and Ban Effective Dates
 - a. Effective Dates Based on National Capacity Determinations
 - b. Case-by-Case Extensions
6. Exemption for Treatment in Surface Impoundments
7. Dilution Prohibition
8. Storage Prohibition
9. Variance from the Treatment Standard
10. "No Migration" Exemption
11. Permit Modifications and Changes During Interim Status
12. Treatment Standards and Effective Dates for Restricted Wastes
13. The California List

II. Summary of Today's Proposal

- A. Proposed Approach
- B. Best Demonstrated Available Technologies (BDAT)
- C. Waste Analysis Requirements
- D. Nationwide Variances from the Effective Date
- E. "Soft Hammer" Requirements
- F. "No Migration" Petition

III. Regulatory Approach for the First Third Wastes

- A. Determination of Treatability Groups and Development of BDAT Treatment Standards

1. Waste Treatability Groups
2. Demonstrated Treatment Technologies
3. Selection of Facilities for Engineering Visits and Sampling
4. Hazardous Constituents Considered and Selected for Regulation (BDAT List)
5. Compliance with Performance Standards
6. Identification of BDAT
7. BDAT Treatment Standards for "Derived-From" and "Mixed" Wastes
 - a. Applicability of BDAT to "Derived-From" Wastes From Treatment Trains Generating Multiple Residues
 - b. Applicability of BDAT to Mixtures and Other Derived-From Residues
8. Transfer of Treatment Standards
9. "No Land Disposal" as the Treatment Standard
10. Waste-Specific Treatment Standards
 - a. K061—Emission Control Dust/Sludge from the Primary Production of Steel in Electric Furnaces
 - b. K062—Spent Pickle Liquor Generated by Steel Finishing Operations of Facilities Within the Iron and Steel Industry (SIC Codes 331 and 332)
 - c. K016—Heavy Ends or Distillation Residues from the Production of Carbon Tetrachloride
 - K018—Heavy Ends from the Fractionation in Ethyl Chloride Production
 - K019—Heavy Ends from the Distillation of Ethylene Dichloride Production
 - K020—Heavy Ends from the Distillation of Vinyl Chloride in Vinyl Chloride Monomer Production
 - K030—Column Bottoms or Heavy Ends from the Combined Production of Trichloroethylene and Perchloroethylene
 - d. K024—Distillation Bottoms from the Production of Phthalic Anhydride from Naphthalene
 - e. K103—Process Residues from Aniline Extraction from the Production of Aniline
 - K104—Combined Wastewater Streams Generated from Nitrobenzene/Aniline Production
 - f. K071—Brine Purification Muds from the Mercury Cell Process in Chlorine Production, where Separately Prepurified Brine is Not Used
 - g. K048—Dissolved Air Flotation (DAF) Float from the Petroleum Refining Industry
 - K049—Slop Oil Emulsion Solids from the Petroleum Refining Industry
 - K050—Heat Exchanger Bundle Cleaning Sludge from the Petroleum Refining Industry
 - K051—API Separator Sludge from the Petroleum Refining Industry

- K052—Tank Bottoms (Leaded) from the Petroleum Refining Industry
- h. K069—Emission Control Dust/Sludge from Secondary Lead Smelting
- i. K015—Still Bottoms from the Distillation of Benzyl Chloride
- j. K037—Wastewater Treatment Sludges from the Production of Disulfoton
- k. K004—Wastewater Treatment Sludge from the Production of Zinc Yellow Pigments
- K008—Oven Residue from the Production of Chrome Oxide Green Pigments
- K036—Still Bottoms from Toluene Reclamation Distillation in the Production of Disulfoton
- K073—Chlorinated Hydrocarbon Waste from the Purification Step of the Diaphragm Cell Process Using Graphite Anodes in Chlorine Production
- K100—Waste Leaching Solution from Acid Leaching of Emission Control Dust/Sludge from Secondary Lead Smelting
- B. Testing and Recordkeeping
1. Waste Analysis
 2. Notification Requirements
 3. Recordkeeping Requirements for Storage Facilities
- C. "Soft Hammer" Provisions
1. Applicability
 2. Interpretation of Specific Terms
 - a. "Treatment"
 - b. "Facility"
 - c. "Certification by Owners or Operators as well as Generators"
 3. Certification Requirements
 4. Treatment of "Soft Hammer" Wastes in Surface Impoundments
 5. Retrofitting Variances
- D. Disposal of Restricted Wastes Subject to an Extension of the Effective Date
- E. Relationship to California List Prohibitions
- F. Determination as to the Availability of the Two-Year Nationwide Variance for Solvent Wastes Which Contain Less Than 1% Total F001-F005 Solvent Constituents
- G. Storage Prohibition
- H. Petitions to Allow Land Disposal of Prohibited Wastes
1. Overview
 2. Requirements of "No Migration" Petitions in the November 7, 1986 Final Rule
 3. Regulatory Requirements of RCRA Sections 3004(f) and (g) November 7, 1986 Final Rule
 4. Additional Requirements for "No Migration" Petitions for Surface Units
- I. Proposed Approach To Comparative Risk Assessment
- J. Determination of Alternative Capacity and Effective Dates for the First Third Wastes
1. Quantities of Wastes Land Disposed
 2. Required Alternative Capacity
 3. Capacity Currently Available and Effective Dates
 4. Capacity Variances for "Derived-From" and "Mixed" Wastes
 5. Capacity Variances for "Soft Hammer" Wastes
- IV. Modifications to the Land Disposal Restrictions Framework
- A. General Waste Analysis (§ 264.13 and § 265.13)
 - B. Operating Record (§ 264.73 and § 265.73)
 - C. Purpose, Scope, and Applicability (§ 268.1)
 - D. Treatment in Surface Impoundment Exemption (§ 268.4)
 - E. Case-by-Case Extensions (§ 268.5)
 - F. "No Migration" Petitions (§ 268.6)
 - G. Testing and Recordkeeping (§ 268.7)
 - H. Landfill and Surface Impoundment Restrictions (§ 268.8)
 - I. Waste Specific Prohibitions—First Third Wastes (§ 268.33)
 - J. Treatment Standards (§ 268.40, § 268.41, and § 268.43)
 - K. Storage Prohibition (§ 268.50)
- V. State Authority
- A. Applicability of Rules in Authorized States
 - B. Effect on State Authorizations
 - C. State Implementation
- VI. Effects of the Land Disposal Restrictions Program on Other Environmental Programs
- A. Discharges Regulated Under the Clean Water Act
 - B. Discharges Regulated Under the Marine Protection, Research, and Sanctuaries Act (MPRSA)
 - C. Air Emissions Regulated Under the Clean Air Act
- VII. Regulatory Analyses
- A. Regulatory Impact Analysis
 1. Purpose
 2. Executive Order No. 12291
 3. Basic Approach/Regulatory Alternatives
 4. Methodology
 5. Results
 - B. Regulatory Flexibility Act
 - C. Paperwork Reduction Act
 - D. Review of Supporting Documents
- VIII. Implementation of the Part 268 Land Disposal Restrictions Program
- IX. References
- X. List of Subjects in 40 CFR Parts 264, 265, 268, and 271

I. Background

A. Brief Summary of the Hazardous and Solid Waste Amendments of 1984 (HSWA)

The Hazardous and Solid Waste Amendments (HSWA), enacted on November 8, 1984, require the Agency to promulgate regulations that restrict the land disposal of hazardous wastes. Specifically, the amendments specify dates when particular groups of hazardous wastes are prohibited from

land disposal unless "it has been demonstrated to the Administrator, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous" (RCRA sections 3004(d)(1), (e)(1), (g)(5), 42 U.S.C. 6924(d)(1), (e)(1), (g)(5)). Congress established a separate schedule for restricting the disposal by underground injection into deep injection wells of solvent- and dioxin-containing hazardous wastes and wastes referred to collectively as California list hazardous wastes (RCRA section 3004(f)(2), 42 U.S.C. 6924(f)(2)).

The amendments also require the Agency to set "levels or methods of treatment, if any, which substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste so that short-term and long-term threats to human health and the environment are minimized" (RCRA section 3004(m)(1), 42 U.S.C. 6924(m)(1)). Wastes that meet treatment standards established by EPA are not prohibited and may be land disposed. The Agency can also grant a variance from a treatment by revising the treatment standard for a waste through rulemaking procedures. In addition, a hazardous waste that does not meet the treatment standard may be land disposed provided the "no migration" demonstration specified in sections 3004(d)(1), (e)(1), and (g)(5) is made.

For the purposes of the restrictions, HSWA defines land disposal "to include, but not be limited to, any placement of * * * hazardous waste in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, or underground mine or cave" (RCRA section 3004(k), 42 U.S.C. 6924(k)).

Although HSWA defines land disposal to include injection wells, such disposal of solvents, dioxins, and the California list wastes is covered on a separate schedule. The disposal of such wastes in deep-wells is subject to the land disposal restrictions by August 8, 1988.

The land disposal restrictions are effective when promulgated unless the Administrator grants a national variance from the statutory date and establishes a different date (not to exceed two years beyond the statutory deadline) based on "the earliest date on which adequate alternative treatment, recovery, or disposal capacity which

protects human health and the environment will be available" (RCRA section 3004(h)(2), 42 U.S.C. 6924(h)(2)). In addition, the Administrator may grant a case-by-case extension of the statutory deadline for up to one year, renewable once for up to one additional year, when an applicant "demonstrates that there is a binding contractual commitment to construct or otherwise provide such alternative capacity but due to circumstances beyond the control of such applicant such alternative capacity cannot reasonably be made available by such effective date" (RCRA section 3004(h)(3), 42 U.S.C. 6924(h)(3)).

The statute also allows treatment of hazardous wastes in surface impoundments that meet certain minimum technological requirements (certain exceptions are allowed). Treatment in surface impoundments is permissible provided the treatment residues that do not meet the treatment standard(s) (or applicable statutory prohibition levels where no treatment standards have been established) are "removed for subsequent management within one year of the entry of the waste into the surface impoundment" (RCRA section 3005(j)(11)(B), 42 U.S.C. 6925(j)(11)(B)).

In addition to prohibiting the land disposal of hazardous wastes, Congress also prohibited the storage of restricted wastes unless "such storage is solely for the purpose of the accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment or disposal" (RCRA section 3004(j), 42 U.S.C. 6924(j)).

1. Solvents and Dioxins

As of November 8, 1986, HSWA prohibits the land disposal (except by underground injection into deep wells) of the following wastes: dioxin-containing hazardous wastes numbered F020, F021, F022, and F023; and solvent-containing hazardous wastes numbered F001, F002, F003, F004, and F005 in 40 CFR 261.31 (RCRA sections 3004(e)(1), (e)(2), 42 U.S.C. 6924 (e)(1), (e)(2)). Effective August 8, 1988, the disposal of these wastes into deep injection wells is prohibited (RCRA sections 3004 (f)(2), (f)(3), 42 U.S.C. 6924 (f)(2), (f)(3)). During the period ending November 8, 1988, this prohibition does not apply to disposal of solvent- and dioxin-contaminated soil or debris resulting from a response action taken under section 104 or 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) or a corrective action taken under Subtitle C of RCRA (RCRA section 3004(e)(3), 42 U.S.C. 6924(e)(3)).

2. California List Wastes

As of July 8, 1987, the statute prohibits further land disposal (except by deep well injection) of the following wastes listed or identified under section 3001 of RCRA.

- (A) Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing free cyanides at concentrations greater than or equal to 1,000 mg/l.
- (B) Liquid hazardous wastes, including free liquids associated with any solid or sludge, containing the following metals (or elements) or compounds of these metals (or elements) at concentrations greater than or equal to those specified below:
 - (i) arsenic and/or compounds (as As) 500 mg/l;
 - (ii) cadmium and/or compounds (as Cd) 100 mg/l;
 - (iii) chromium (VI and/or compounds (as Cr VI)) 500 mg/l;
 - (iv) lead and/or compounds (as Pb) 500 mg/l;
 - (v) mercury and/or compounds (as Hg) 20 mg/l;
 - (vi) nickel and/or compounds (as Ni) 134 mg/l;
 - (vii) selenium and/or compounds (as Se) 100 mg/l; and
 - (viii) thallium and/or compounds (as Tl) 130 mg/l.
- (C) Liquid hazardous waste having a pH less than or equal to two (2.0).
- (D) Liquid hazardous wastes containing polychlorinated biphenyls at concentrations greater than or equal to 50 ppm.
- (E) Hazardous wastes containing halogenated organic compounds in total concentration greater than or equal to 1,000 mg/kg.

(RCRA sections 3004 (d)(1), (d)(2), 42 U.S.C. 6924 (d)(1), (d)(2)). Effective August 8, 1988, the underground injection into deep wells of these wastes is prohibited (RCRA sections 3004 (f)(2), (f)(3), 42 U.S.C. 6924 (f)(2), (f)(3)). During the period ending November 8, 1988, there is no prohibition on the land disposal of California list wastes that are contaminated soil or debris resulting from a response action taken under section 104 or 106 of CERCLA or a corrective action taken under Subtitle C of RCRA (RCRA section 3004(e)(3), 42 U.S.C. 6924(e)(3)).

3. Scheduled Wastes

The amendments required the Agency to prepare a schedule, by November 8, 1986, for restricting the land disposal of all hazardous wastes listed or identified as of November 8, 1984 in 40 CFR Part 261, excluding solvent- and dioxin-containing wastes and California list wastes covered under the schedule set by Congress. The schedule, based on a ranking of the listed wastes that

considers their intrinsic hazard and their volume, is to ensure that prohibitions and treatment standards are promulgated first for high volume hazardous wastes with high intrinsic hazard before standards are set for low volume wastes with low intrinsic hazard. The statute further requires that these determinations be made by the following deadlines:

(A) At least one-third of all listed hazardous wastes by August 8, 1988.

(B) At least two-thirds of all listed hazardous wastes by June 8, 1989.

(C) All remaining listed hazardous wastes and all hazardous wastes identified as of November 8, 1984 by one or more of the characteristics defined in 40 CFR Part 261 by May 8, 1990.

If EPA fails to set a treatment standard by the statutory deadline for any hazardous waste in the first-third or second-third of the schedule, the waste may be disposed in a landfill or surface impoundment provided the unit is in compliance with the minimum technological requirements specified in section 3004(o) of RCRA. In addition, prior to disposal, the generator must certify to the Administrator that he has investigated the availability of treatment capacity and has determined that disposal in such landfill or surface impoundment is the only practical alternative to treatment currently available to the generator. This restriction on the use of landfills and surface impoundments applies until EPA sets a treatment standard for the waste. The use of other forms of land disposal is not similarly restricted, and may continue to be used for disposal of untreated wastes until EPA promulgates treatment standards, or until May 8, 1990, whichever is sooner. If the Agency fails to set a treatment standard for any ranked hazardous waste by May 8, 1990, the waste is automatically prohibited from land disposal unless the waste is the subject of a successful "no migration" demonstration (RCRA section 3004(g), 42 U.S.C. 6924(g)). In a May 28, 1986 final rule (51 FR 19300), EPA published the schedule for setting treatment standards for the listed hazardous wastes, with all wastes that are identified as hazardous by characteristic being ranked in the third-third. This schedule is incorporated in 40 CFR 268.10, 268.11, and 268.12.

4. Newly Identified and Listed Wastes

RCRA requires the Agency to set a treatment standard for any hazardous waste that is newly identified or listed in 40 CFR Part 261 after November 8, 1984 within six months of the date of identification or listing (RCRA section

3004(g)(4), 42 U.S.C. 6924(g)(4)).

However, the statute does not provide for an automatic prohibition on the land disposal of such wastes if EPA fails to establish treatment standards within the six-month period.

B. Summary of the Land Disposal Restrictions Framework

In this section EPA describes, for the readers' convenience, the existing land disposal regulations under 40 CFR Part 268. EPA, however, is not reopening any of these existing rules for public comment unless it explicitly says so elsewhere in the preamble.

1. Regulatory Framework

On November 7, 1986, EPA promulgated a final rule (51 FR 40572) establishing the regulatory framework for implementing the land disposal restrictions. Corrections to the November 7, 1986 final rule were included in a June 4, 1987 Federal Register notice (52 FR 21010) to clarify the Agency's approach to regulating restricted wastes. Some changes to the framework were made in the July 8, 1987 rulemaking that prohibited certain California list wastes (52 FR 25760). By each statutory deadline, and in accordance with the schedule promulgated on May 28, 1986 (51 FR 19300), the Agency must promulgate the applicable treatment standards under Part 268 Subpart D for each hazardous waste. Once the treatment standards are effective, restricted wastes may be land disposed in a Subtitle C hazardous waste facility if they meet the applicable treatment standards. However, if treatment standards are not promulgated by the statutory and scheduled deadlines, such wastes are prohibited from land disposal unless certain demonstrations are made by those who wish to continue land disposal. Such demonstrations are allowed only until May 8, 1990 (when wastes are automatically prohibited by statute), or until EPA promulgates treatment standards, whichever is sooner.

After the effective dates of the prohibitions, wastes that do not comply with the applicable treatment standards will be prohibited from continued placement in land disposal units unless a petition has been approved under § 268.6 demonstrating that there will be no migration of hazardous constituents from the land disposal unit or injection zone for as long as the waste remains hazardous. Also, EPA may grant an extension to the effective date under § 268.5 on a case-by-case basis.

2. Applicability

The land disposal restrictions apply prospectively to the affected wastes. In other words, hazardous wastes land disposed after the effective date are subject to the restrictions, but wastes land disposed prior to the applicable effective date are not required to be removed or exhumed for treatment. Similarly, the restrictions on storage of affected hazardous wastes apply only to wastes placed in storage after the effective date of an applicable land disposal restriction. If, however, wastes subject to the land disposal restrictions are removed from storage or land disposal after the effective date, such wastes would be subject to the restrictions and treatment standards.

The provisions of the land disposal restrictions apply to wastes produced by generators of 100 to 1,000 kilograms of hazardous waste (or greater than 1 kg of acute hazardous waste) in a calendar month. However, wastes produced by generators of less than 100 kilograms of hazardous waste (or less than 1 kg of acute hazardous waste) per calendar month are conditionally exempt from RCRA regulation, including the land disposal restrictions.

The land disposal restrictions apply to both interim status and permitted facilities, as well as those not regulated under RCRA. All permitted facilities are subject to the restrictions, regardless of existing permit conditions. The land disposal restrictions supersede 40 CFR 270.4(a), which currently provides that compliance with a RCRA permit constitutes compliance with Subtitle C.

3. Development of § 300.4(m) Treatment Standards

In the November 7, 1986 rulemaking, EPA promulgated a technology-based approach to establishing treatment standards under section 3004(m). These treatment standards are generally based on the performance of the best demonstrated available technology (BDAT) identified for the hazardous constituents.

In developing the treatment standards, EPA characterizes the wastes and establishes treatability groups for wastes having similar physical and chemical properties and, thus, similar treatability characteristics. Once the treatability groups are established, EPA collects and analyzes data on identified technologies used to treat the wastes in each treatability group.

EPA identifies those technologies that are "demonstrated" by full-scale operations. The demonstrated technologies are then evaluated to determine whether they may be

considered "available". To be considered "available," the Agency determines whether the demonstrated technologies (1) are commercially available, (2) do not present a clear increase in risk to human health and the environment when compared to land disposal of the untreated wastes, and (3) substantially diminish the toxicity of the waste or substantially reduce the likelihood of migration of hazardous constituents from the waste.

The performance data on the demonstrated available technologies are then evaluated to determine whether the data is representative of well-designed and well-operated treatment systems. Only data from well designed and operated systems are included in determining BDAT. The performance data on well-designed and well-operated demonstrated available technologies are then statistically analyzed to determine the performance level representative of treatment by BDAT.

EPA may establish treatment standards as either a specific technology, or as a performance level of treatment monitored by measuring the concentration level of the hazardous constituents in the waste or treatment residual or an extract of the waste or treatment residual. When possible, EPA prefers to establish treatment standards as performance levels, allowing the regulated community greatest flexibility in meeting the treatment standard. When treatment standards are set as performance levels, the regulated community may use any technology (not otherwise prohibited, e.g., impermissible dilution) to treat the waste to meet the treatment standard and is not limited to only those technologies considered in determining BDAT. However, when treatment standards are expressed as specific treatment methods, such methods must be employed.

4. Application of the Toxicity Characteristic Leaching Procedure (TCLP)

In the November 7, 1986 final rule, EPA promulgated regulations requiring the regulated community to use the Toxicity Characteristic Leaching Procedure (TCLP) (Part 268 Appendix I) when developing an extract from a restricted solvent or dioxin-containing waste or treatment residual. This extract must be analyzed to determine whether the concentrations of hazardous constituents meet the applicable treatment standards (which are expressed in Table CCWE at § 268.41 as constituent levels in the TCLP extract). EPA notes that the TCLP has only been

promulgated for monitoring compliance with the treatment standards established for the F001-F005 spent solvent wastes and the F020-F023 and F026-F028 dioxin-contaminated wastes. The TCLP was not promulgated for monitoring compliance with the California list restrictions.

5. Determination of Alternative Capacity and Ban Effective Dates

a. *Effective Dates Based on National Capacity Determinations.* The Agency has the authority to grant national variances (not to exceed two years) to the statutory effective date based upon a lack of adequate alternative treatment, recovery or disposal capacity. To make this determination, EPA considers, on a nationwide basis, both the capacity of alternative treatment technologies (permitted and interim status facilities that will be on-line by the effective date) and the quantity of restricted wastes generated. If adequate capacity is available, the restriction on land disposal of that waste goes into effect by the statutory deadline. If there is a significant shortage of national capacity, EPA may establish an alternative effective date based on the earliest date on which adequate capacity for treatment, recovery or disposal that is protective of human health and the environment will be available.

During the period of the national variance, the waste is not subject to the land disposal prohibitions. However, if the waste is land disposed, it must be disposed in facilities in compliance with the minimum technological requirements of RCRA section 3004(o) (42 U.S.C. 6924(o)). (Note: EPA is proposing in today's notice to amend this provision to require that where such waste is disposed in a landfill or surface impoundment unit, the unit must be in compliance with the minimum technological requirements.)

b. *Case-by-Case Extensions.* The Agency will consider granting up to a 1-year extension (renewable only once) of a ban effective date on a case-by-case basis. The applicant must demonstrate (among other things stated in § 268.5) that a good faith effort has been made to locate and contract with treatment, recovery, or disposal facilities nationwide to manage his wastes, and that he has entered into a binding contractual commitment to construct or otherwise provide alternative capacity that cannot reasonably be made available by the applicable effective date due to circumstances beyond his control. During the period of the extension, the waste is not subject to the land disposal prohibitions. However, if the waste is land disposed, it must be

disposed in units in compliance with the minimum technological requirements of RCRA section 3004(o) (42 U.S.C. 6924(o)). (Note: EPA is proposing in today's notice to amend this provision to require that where such waste is disposed in a landfill or surface impoundment unit, the unit must be in compliance with the minimum technological requirements.)

6. Exemption for Treatment in Surface Impoundments

Wastes that would otherwise be prohibited from one or more methods of land disposal may be treated in a surface impoundment that meets certain technological requirements (§ 268.4(a)(3)) as long as treatment residuals that do not meet the applicable treatment standard (or statutory prohibition levels where no treatment standards are established) are removed within one year of entry into the impoundment and are not placed into any other surface impoundment for subsequent management. The owner or operator of such an impoundment must certify to the Regional Administrator that the technical requirements have been met and must also submit a copy of the waste analysis plan that has been modified to provide for testing treatment residuals in accordance with § 268.4 requirements.

As promulgated in the July 8, 1987 California list final rule (52 FR 25760), evaporation of hazardous constituents as the principal means of treatment is not considered treatment for the purposes of this exemption (§ 268.4(b)).

7. Dilution Prohibition

As established in the November 7, 1986 rule, and slightly modified in the July 8, 1987 rule, dilution is prohibited as a substitute for adequate treatment in complying with the land disposal restrictions. This includes dilution in lieu of adequate treatment to meet established treatment standards, as well as dilution to circumvent the effective date of a prohibition, or dilution to otherwise avoid a prohibition (§ 268.3). However, dilution is permitted as a necessary part of the treatment process.

8. Storage Prohibition

Storage of restricted wastes is prohibited except where storage is solely for the purpose of accumulating such quantities of wastes as are necessary to facilitate proper treatment, recovery, or disposal (§ 268.50). Treatment, storage, and disposal facilities may store restricted wastes for as long as needed, provided such storage is solely for this purpose. However, if the facility stores a

restricted waste for more than one year, it bears the burden of proof that such storage was solely for this purpose (no notification of storage exceeding one year is required). For storage of less than one year, EPA bears the burden of proof that such storage was not for the sole purpose of accumulating such quantities of wastes as are necessary to facilitate proper treatment, recovery, or disposal. The prohibition on storage does not apply to wastes which meet the treatment standard, wastes which have been granted an extension to the effective date, and wastes which are the subject of a "no migration" exemption under § 268.6.

9. Variance From the Treatment Standard

EPA established the variance from the treatment standard to account for those wastes which are unable to be treated to meet the applicable treatment standards, even if well-designed and well-operated BDAT treatment systems are used (§ 268.44). Petitions must demonstrate (among other things) that the waste is significantly different from the wastes evaluated by EPA in establishing the treatment standard and that the waste cannot be treated in compliance with the applicable treatment standard. This variance procedure could result in the establishment of a new waste treatability group and corresponding treatment standard that would apply to all wastes meeting the criteria of the new waste treatability group.

10. "No Migration" Exemption

EPA will consider allowing the land disposal of a specific untreated restricted waste at a specific site if the Agency determines that the applicable land disposal method is protective of human health and the environment (§ 268.6). For the Agency to make this determination, a petitioner must demonstrate (among other things) that such disposal will not allow the migration of hazardous constituents from the disposal unit or injection zone for as long as the waste remains hazardous. (RCRA section 3004(d), 42 U.S.C. 2964(d)(1)). Today's notice includes the Agency's proposed amendments to the "no migration" petition requirements under § 268.6.

11. Permit Modifications and Changes During Interim Status

To facilitate the implementation of the land disposal restrictions, § 270.42 was modified in the November 7, 1986 rule to allow permitted treatment facilities more flexibility to treat restricted

wastes not previously specified in their permit Upon Federal or State approval of a minor permit modification (under § 270.42), treatment facilities may treat wastes prohibited from one or more methods of land disposal provided that treatment is in accordance with established treatment standards, that handling and treatment of the restricted wastes will not present substantially different risks from those wastes listed in the permit, and that no changes in the treatment process or physical equipment are made to accommodate these wastes.

The July 8, 1987 California list final rule allowed permitted facilities to use the minor modification process, under certain conditions, to obtain approval to change their facilities to treat or store restricted wastes in tanks and containers as necessary to comply with the land disposal restrictions. This rule also allowed interim status facilities to expand their operations by more than 50 percent, in terms of capital expenditures, to treat or store restricted wastes in tanks or containers as necessary to comply with the land disposal restrictions.

12. Treatment Standards and Effective Dates for Restricted Wastes

Treatment standards and effective dates for restricted wastes are discussed in detail in the November 7, 1986 rule on solvents and dioxins, and in the July 8, 1987 final rule on California list wastes. The applicable effective dates for restricted wastes are found at 40 CFR Part 268 Subpart C. The applicable treatment standards for restricted wastes are found at 40 CFR Part 268 Subpart D.

13. The California List

EPA promulgated the land disposal restrictions final rule for some California list wastes on July 8, 1987 (52 FR 25760). This rule promulgated treatment standards and corresponding effective dates for the California list hazardous wastes containing polychlorinated biphenyls (PCBs) and most of the California list wastes containing halogenated organic compounds (HOCs), and codified the statutory prohibition for certain corrosive wastes. This rule also established methods for determining compliance with the prohibitions and made some modifications (as discussed previously) to the land disposal restrictions framework promulgated November 7, 1986 (51 FR 40572).

No prohibition levels or treatment standards were established for the California list hazardous wastes containing metals or free cyanides. However, the statutory prohibitions took

effect on July 8, 1987 by operation of the "hammer provision" in RCRA section 3004(d). A notice of data availability and request for comment, which outlines the Agency's findings with respect to establishing more stringent prohibition levels for the metal and cyanide wastes, was published on August 12, 1987 (52 FR 29992). A final rule establishing prohibitions for these wastes may be forthcoming.

The California list final rule requires that the Paint Filter Liquids Test (PFLT) be used to determine whether a waste, including a free cyanide or metal-bearing waste, is considered to be a liquid for purposes of the California list land disposal restrictions. This procedure is method 9095 in EPA Publication No. SW-846, "Test Methods for Evaluating Solid Waste."

To determine compliance with the statutory prohibition levels for the metal and free cyanide wastes, EPA will evaluate whether the PLFT filtrate contains the prohibited constituents in concentrations exceeding the specified levels. However, compliance with the HOC, PCB, and corrosive waste prohibitions requires the analysis of the entire waste, not a PFLT-generated filtrate.

The California list final rule integrated a number of TSCA PCB requirements into the RCRA framework. This ensures that where inconsistencies exist between TSCA and RCRA standards, the more stringent regulations govern.

The July 8, 1987 final rule established treatment standards as specified technologies for California list PCB and HOC wastes (except dilute HOC wastewaters). All liquid and nonliquid hazardous wastes containing HOCs (listed in Appendix III of Part 268) in total concentration greater than or equal to 1,000 mg/kg, except dilute HOC wastewaters (i.e., primarily water mixtures containing HOCs in concentrations greater than or equal to 1,000 mg/l but less than 10,000 mg/l), must be incinerated in accordance with the requirements of Part 264 Subpart O or Part 265 Subpart O. However, EPA determined that there is a nationwide lack of incineration capacity for these HOC wastes requiring incineration and, therefore, granted a 2-year variance from the treatment standard.

Treatment standards were not established for dilute HOS wastewaters. Dilute HOC wastewaters need not be incinerated, but they must be treated to below the 1,000 mg/l prohibition level. Dilute HOC wastewaters were not granted a variance and were prohibited from land disposal as of July 8, 1987.

Liquid hazardous wastes containing PCBs at concentrations greater than or

equal to 50 ppm must be treated in accordance with existing TSCA thermal treatment regulations at 40 CFR Part 761. For PCB concentrations greater than or equal to 50 ppm but less than 500 ppm, incineration in accordance with the technical requirements of 40 CFR 761.70 or burning in high efficiency boilers in accordance with the technical requirements of 40 CFR 761.60 is required. For PCB concentrations greater than or equal to 500 ppm, incineration in accordance with the technical requirements of 40 CFR 761.70 is required. Thermal treatment for PCBs must also be in compliance with applicable regulations in Parts, 264, 265, and 266. No extension to the effective date was granted.

Wastes which are contaminated soil and debris resulting from response actions taken under sections 104 and 106 of CERCLA or corrective actions taken under Subtitle C of RCRA are not subject to these restrictions until November 8, 1988.

II. Summary of Today's Proposal

A. Proposed Approach

Today's notice describes the Agency's proposed approach to implementing the requirements of RCRA section 3004(g) with respect to certain of the listed hazardous wastes included in § 268.10, as promulgated on May 28, 1986 (51 FR 19300). Pursuant to RCRA, the Agency is required to promulgate regulations establishing conditions under which these so-called "First Third" wastes may be land disposed by the statutory deadline of August 8, 1988. August 8, 1988 is also the date by which the Agency must make determinations regarding the conditions under which the F001-F005 solvents and F020-F023 and F026-F028 dioxin-containing wastes (see 51 FR 40572), California list wastes (see 52 FR 25760), and First Third wastes may be land disposed by deep-well injection. The Agency's proposed approach to restricting the disposal of these wastes by deep-well injection will be addressed in a separate notice.

EPA is proposing treatment standards for only some of the First Third wastes in today's proposal. The Agency will continue to analyze treatment data on additional First Third wastes and will publish a supplementary proposal of treatment standards for these wastes in the near future. However, due to the lack of available data and the time constraints of the statutory schedule, EPA does not expect to promulgate treatment standards for all of the First Third wastes by August 8, 1988. Therefore, in accordance with the

provisions of section 3004(g)(6), the Agency is proposing regulations which allow continued land disposal of First Third wastes for which treatment standards or extensions to the effective date have not been established. These so-called "soft hammer" provisions (discussed in further detail in Section III. C. of today's proposal) will apply until May 8, 1990 or until treatment standards or extensions to the effective date are promulgated, whichever is sooner. On May 8, 1990, there is an automatic prohibition on land disposal of hazardous wastes listed or identified prior to the enactment of HSWA. Effective May 8, 1990, these wastes may be land disposed only if the waste; (a) Meets the applicable treatment standards; (b) is the subject of an extension to the effective date; or (c) is the subject of an approved "no migration" petition.

B. Best Demonstrated Available Technologies (BDAT)

In today's notice, the Agency defines the waste treatability groups by waste codes and identifies the Best Demonstrated Available Technology (BDAT) for each waste code (see Section III. A.). Treatment standards applicable to the specific waste code are based on the performance levels achievable by the corresponding BDAT identified for each waste code. However, any technology not otherwise prohibited (i.e., impermissible dilution) may be used to meet the concentration-based treatment standards.

Incineration is identified as BDAT for waste codes K015, K016, K018, K019, K020, K024, K030, K037, and K048-K052. Chromium reduction, chemical precipitation, and vacuum filtration is identified as BDAT for K062. Solvent extraction followed by incineration of the extract and followed by steam stripping and activated carbon adsorption is BDAT for K103 and K104. High temperature metals recovery is BDAT for K061. For K071, acid leaching and chemical oxidation is BDAT for nonwastewaters, and sulfide precipitation and filtration is BDAT for wastewaters. Total recycle is identified as BDAT for K069 wastes. Also, EPA has determined that the wastes K004, K008, K036, K073, and K100 are no longer being generated and disposed, and therefore, has not identified BDAT for these wastes.

C. Waste Analysis Requirements

Treatment standards for organic wastes and wastes for which destruction technologies are appropriate, are based on total constituent analysis. For those wastes

for which stabilization or fixation is appropriate, treatment standards are based on concentrations in an extract developed by the Toxicity Characteristic Leaching Procedure (TCLP) (see Part 268 Appendix I).

D. Nationwide Variances From the Effective Date

Due to lack of sufficient alternative capacity to treat the wastes to the applicable treatment standards, a national capacity variance is proposed for several of the waste codes covered by today's notice. This determination is based on a comparison of the volumes of wastes requiring treatment to the amount of treatment capacity available for such treatment. Although EPA does not require BDAT technologies be used to meet the applicable treatment standards, capacity figures are derived based on technologies identified as BDAT, to ensure that adequate treatment is available to meet the treatment standards.

The Agency is proposing to grant a two-year national variance for the following waste codes: K016, K018, K019, K020, K024, K030, K037, K048-K052, K061, K071, K103, and K104. No variance is proposed for other wastes. A more detailed discussion is found in Section III. J. [Note: EPA has recently conducted a survey of treatment, storage, and disposal facilities. Capacity determinations based on this new data will be proposed and available for use in the final rule.]

E. "Soft Hammer" Requirements

Section III. C. 3. of this notice presents a more detailed discussion of the certification and demonstrations a generator (or owner or operator) is required to make to dispose of "soft hammer" wastes in landfills and surface impoundments. Generally, the generator (or owner or operator) must certify that there is no treatment that meaningfully reduces toxicity or mobility of the waste practically available, and that, therefore, disposal of these wastes in a landfill or surface impoundment unit that meets the minimum technological requirements of 3004(o) (double liner, leachate collection system, and ground water monitoring) is the only practical alternative. This certification also applies to those "soft hammer" wastes which have been treated to reduce toxicity or mobility and for which no further treatment is practically available, and thus, disposal of the treatment residuals in a landfill or surface impoundment unit that meets the minimum technological requirements is the only alternative.

F. "No Migration" Petition

Today's notice also proposes amendments to 40 CFR 268.6, the "no migration" petition process (see Section III. H.). These amendments to § 268.6 cover the demonstrations required in the petition and certain other requirements on the owner or operator of a waste management unit that is subject to a "no migration" exemption.

III. Regulatory Approach for the First Third Wastes

A. Determination of Treatability Groups and Development of BDAT Treatment Standards

1. Waste Treatability Groups

For the First Third wastes, EPA used the individual listed waste codes as the starting point for developing treatability waste groups. In cases where EPA believed that wastes represented by different codes could be treated to similar concentrations using identical technologies, the Agency combined the codes into one treatability group. EPA based its initial treatability group decisions primarily on whether the waste codes were generated by the same or similar industries from similar processes. EPA believes that such groupings can be made even with limited data because of the high likelihood that characteristics affecting treatment performance will be similar for these different waste codes. For example, the five waste codes pertaining to wastes produced by petroleum refining (K048-K052) were combined into a single treatability group. This analysis resulted in 15 treatability groups covering 24 waste codes that are the subject of today's proposed rulemaking.

2. Demonstrated Treatment Technologies

As discussed in EPA's promulgated methodology for BDAT (see November 7, 1986, 51 FR 40572), a technology is considered to be demonstrated for a particular waste if the technology currently is in commercial operation for treatment of that waste or a similar waste. For most of the First Third waste codes covered by today's proposal, EPA identified demonstrated technologies either through review of literature discussing current waste treatment practices or on the basis of information provided by specific facilities currently treating the waste or similar wastes.

In cases where the Agency did not identify any facilities currently treating wastes represented by a particular waste code, EPA identified demonstrated technologies in the

following manner. The Agency first characterized the parameters affecting treatment selection for the waste of interest. EPA then compared these parameters to other wastes for which treatment technologies are demonstrated; if the parameters were similar, the Agency considered the treatment technology also to be demonstrated for the waste of interest. For example, EPA considers rotary kiln incineration a demonstrated technology for many waste codes containing hazardous organic constituents, high total organic content and high filterable solids regardless of whether any facility is currently treating these wastes. The basis for this determination is data found in literature as well as data generated by EPA confirming the use of rotary kiln incineration on wastes having the above characteristics. EPA's rationale for determining demonstrated technologies for each of the waste treatability groups can be found in Section III. A. 10. (in the subsections for each specific treatability group).

3. Selection of Facilities for Engineering Visits and Sampling

In those instances where additional data were needed to supplement the Agency's current knowledge of treatment performance for the demonstrated technologies, EPA arranged engineering visits to facilities that treat wastes with a demonstrated technology that potentially could be the basis for the treatment standards. The purpose of the engineering visits was to confirm that candidates for sampling, in fact, met EPA's criteria of being well-designed facilities and that the necessary sampling points could be accessed. During the visit, EPA also confirmed that the facility appeared to be well operated, although the actual operation that occurs during sampling is the basis for EPA's decisions regarding proper operation of the treatment unit.

In general, the Agency considers a well-designed facility as one that contains all the unit operations necessary to treat the various hazardous constituents of the waste and any other nonhazardous materials in the waste that may affect treatment performance. For example, a waste containing hazardous metals and a high concentration of oil and grease would require removal of potentially nonhazardous oil and grease in order to facilitate the subsequent removal of the hazardous metals by precipitation. EPA also places considerable emphasis on the levels of performance the system is designed to achieve in determining whether to sample a particular treatment facility, since the facility will

seldom exceed the goals of its original design.

In addition to ensuring that a system is reasonably well-designed, the engineering visit examines whether the facility appears to be well-operated and, just as importantly, has a measurable way of describing the operation of the treatment system during the time the waste is being treated. For example, EPA may choose not to sample a continuous treatment system for which an important design parameter cannot be continuously recorded through the use of a strip chart. In continuous systems, such instrumentation is important in determining whether the treatment system was operating within design requirements during the period when the waste was being treated.

In addition to the design and operation of the treatment system, EPA also bases its decision to sample a facility on whether the piping layout is such that all samples necessary to evaluate treatment performance can be collected. If piping is not suitable or cannot be easily modified, EPA would not perform a sampling visit.

In order to select potential sites for sampling, EPA has established a hierarchy for conducting its engineering visits. The hierarchy is (1) generators treating single wastes on site; (2) generators treating multiple wastes together on site; (3) commercial TSDFs; and (4) EPA in-house treatment. The basis of this hierarchy is founded on two concepts; (1) EPA believes, to the extent possible, that it should try to develop treatment standards from data produced by treatment facilities handling only a single waste, and (2) facilities that routinely treat a specific waste have had the best opportunity to optimize design parameters. Although excellent treatment can occur at many facilities that are not high in this hierarchy, EPA has adopted this approach to avoid, when possible, ambiguities related to the mixing of wastes. Therefore, EPA prefers on-site treatment facilities where the waste of interest is treated alone or as a major component of the waste handled. If well-designed generator facilities that meet EPA criteria are not available, the Agency then looks to commercial treatment facilities where mixing of many wastes is generally practiced but where extensive optimization of treatment may have still occurred. If no suitable TSDF facilities are identified, EPA then conducts in-house tests and optimizes the process itself on a more limited basis.

EPA used a number of data bases to determine if any generators were treating specific wastes on site or if

there were any commercial TSDFs treating this waste. EPA's documentation for locating on-site generating facilities and/or commercial TSDFs for each waste can be found in the Docket for today's rulemaking. Although EPA's data bases provided potential sites of treatment of individual wastes, the data bases provided no data that would preferentially support the selection of one facility for sampling over another. In cases where several treatment sites appear to fall into the same level of the hierarchy, EPA selected sites for visits strictly on the basis of what facility could most expeditiously be visited and later sampled if justified by the engineering visit.

A secondary consideration involved with the selection of technologies for testing was the need to develop data within an ambitious statutory deadline. When selecting technologies to test for performance, these deadlines required that EPA, in some cases, select demonstrated technologies for performance tests based on its technical judgment. This judgment considered the underlying principles of operation of the various technologies and any available data pertaining to the performance of these technologies on specific types of wastes. EPA's rationale for selecting a given demonstrated technology is presented by a treatability group in Section III. A. 10. of the preamble.

4. Hazardous Constituents Considered and Selected for Regulation (BDAT List)

The target list of hazardous constituents to be regulated for all waste codes covered by today's rule is referred to by the Agency as the BDAT List. This list is derived from a composite of 396 compounds and/or classes of compounds that are presented in 40 CFR Part 261, Appendix VII and Appendix VIII. This composite number includes compounds selected by EPA as representatives of some of the classes. EPA then identified 175 of these 396 for which EPA could not perform an analysis of treatment performance due to one of three reasons: (1) EPA does not presently have an analytical method for such constituents; (2) there are no analytical standards available for calibrating the test instruments; or (3) the analytical method requires the use of an extraction solvent in which the compound would quickly dissociate. The remaining 221 compounds comprise the BDAT List.

For certain waste codes, the BDAT List was then shortened because it was unlikely that particular constituents would be present. EPA's rationale for

shortening the BDAT List for a given waste code or waste treatability group is presented in the Sampling and Analysis Plan (SAP) developed for each Agency sampling visit. The SAP for each tested waste code can be found in the On-Site Engineering Reports in the Docket for today's rulemaking.

The specific constituents that the Agency selected for regulation in each treatability group were, in general, those found in the untreated wastes at significant (i.e., treatable) concentrations. EPA does not propose to regulate constituents where data show that they would be effectively managed by regulation of other constituents (i.e., treatment of the regulated constituents naturally results in the treatment of other constituents). EPA's rationale for the selection of regulated constituents can be found in the BDAT background document for the treatability group in question.

5. Compliance with Performance Standards

All the treatment standards proposed in today's rule reflect performance achieved by the Best Demonstrated Available Technology (BDAT). As such, compliance with these standards only requires that the treatment value be achieved prior to land disposal; it does not require the use of any particular treatment technology. While dilution of the waste as a means to comply with the standard is prohibited, wastes that are generated in such a way as to naturally meet the standard can be land disposed without treatment. With the exception of treatment standards that prohibit any land disposal, all treatment standards proposed today are expressed as a concentration level.

In today's rulemaking, EPA has used both total constituent concentration and TCLP analyses of the treated waste as a measure of technology performance. EPA's rationale for when each of these analytical tests is used is explained below.

For all hazardous organic constituents, EPA is basing the treatment standards on the total constituent concentration found in the treated waste. EPA based its decision on the fact that technologies exist to destroy the various organic compounds. Accordingly, the best measure of performance would be the extent to which the various organic compounds have been destroyed or the total amount of constituent remaining after treatment. [NOTE: EPA's land disposal regulation for F001-F005 spent solvents (51 FR 40572) uses the TCLP value as a measure of performance. At the time that EPA promulgated the treatment

standards for F001-F005, useful data were not available on total constituent concentrations in treated residuals and, as a result, the TCLP data was considered to be the best measure of performance.]

For metal constituents, EPA is using both total constituent concentration and/or the TCLP as the basis for treatment standards. The total constituent concentration is being used when the technology basis includes a metal recovery operation. The underlying principle of metal recovery is the reduction of the amount of metal in a waste by separating the metal for recovery; therefore, total constituent concentration in the treated residual is an important measure of performance for this technology. Additionally, EPA also believes it important that any remaining metal in a treated residual waste not be in a state that is easily leachable; accordingly, EPA is also using the TCLP as a measure of performance. It is important to note then for wastes where treatment standards are based on a metal recovery process, the facility has to comply with both the total constituent concentration and the TCLP prior to land disposal.

In cases where treatment standards for metals are not based on recovery techniques but rather on stabilization, EPA is using the TCLP as a measure of performance. The Agency's rationale is that stabilization is not meant to reduce the concentration of metal in a waste but only chemically minimize the ability of the metal to leach.

6. Identification of BDAT

A detailed discussion of the Agency's general methodology for establishing BDAT standards is provided in EPA's land disposal restrictions rule of November 7, 1986, 51 FR 40572. This section discusses the specific application of the methodology to the First Third wastes, and, provides a summary of some of the principal elements of the BDAT methodology.

As a first step in the development of BDAT-based treatment standards, EPA screened the available treatment data for a particular treatability group with regard to the availability of information describing the design and operation of the system, the quality assurance/quality control analyses of the data, and the specific analytical tests used to assess treatment performance. This screening step is consistent with EPA's promulgated approach in the November 7, 1986 rulemaking for F001-F005 solvents. Also, this screening step recognizes the fact that different performance measures may be appropriate depending on the

technology used (i.e., total constituent analysis for incineration vs. TCLP for stabilization) as discussed earlier. In contrast to the F001-F005 spent solvent rule, EPA was able to place a greater emphasis on the design and operation of the treatment system for the First Third wastes because its field tests have been modified to gather more detailed data to support these analyses. As discussed earlier, the EPA field tests include data describing the operating conditions of the treatment unit during the time that treatment samples were collected.

After the initial screening test, EPA adjusted all treated data values based on the analytical recovery values in order to take into account analytical interferences associated with the chemical make-up of the treated sample. For example, a treated residual data point of 0.2 mg/kg with a recovery value of 50% would be adjusted to 0.4 mg/kg. In developing recovery data (also referred to as accuracy data), EPA would first analyze a waste for a constituent and then add a known amount of the same constituent (i.e., spike) to the waste material. The total amount recovered after spiking minus the initial concentration in the sample divided by the amount added is the recovery value.

After adjusting the data, EPA then averaged the performance values for the various treatment operations and compared the mean values using the analysis of variance test (ANOVA), as described in the November 7, 1986 preamble (see 51 FR 40591), to determine if one technology performed significantly better. EPA's decisions regarding selection of one technology over another that resulted from this methodology can be found in the "Identification of BDAT" sections that follow for each treatability group.

7. BDAT Treatment Standards for "Derived-From" and "Mixed" Wastes

a. Applicability of BDAT to "Derived-From" Wastes From Treatment Trains Generating Multiple Residues. In a number of instances in this proposal, the proposed BDAT consists of a series of operations, each of which generates a waste residue. For example, the identified BDAT for wastes K103 and K104 is solvent extraction, steam stripping and activated carbon adsorption. Each of these treatment steps generates a waste requiring treatment, namely a solvent-containing stream from solvent extraction, a stripper overhead, and spent activated carbon. Treatment of these wastes may generate further residues: for instance, spent activated carbon (if not

regenerated) could be incinerated, generating an ash and possibly a scrubber water waste. Ultimately, additional wastes are generated that may require land disposal. With respect to these wastes, the Agency wishes to emphasize the following points:

1. All of the residues from treating the original listed waste are likewise considered to be the listed waste by virtue of the derived-from rule contained in 40 CFR 261.3(c)(2). Consequently, all of the wastes generated in the course of treatment would be prohibited from land disposal unless they satisfy the treatment standard or meet one of the exceptions to the prohibition.

2. The Agency's proposed treatment standards generally contain a concentration level for wastewaters and a concentration level for nonwastewaters. These treatment standards apply to all of the wastes generated in treating the original prohibited waste. Thus, all solids generated from treating K103 and K104 would have to meet the treatment standard for nonwastewaters. All derived-from wastes meeting the Agency definition of wastewater for this rule (i.e., less than 1% total organic carbon (TOC) and less than 1% total solids) would have to meet the treatment standard for wastewaters. EPA wishes to make clear that this approach is not meant to allow partial treatment only to change the applicable treatment standard. Therefore, treatment of wastes with greater than 1% TOC (and less than 1% solids) to less than 1% TOC does not necessarily make the wastewater treatment standard applicable.

The Agency has not performed tests, in all cases, on every waste that can result from every part of the treatment train. However, the Agency's treatability levels generally are based on treatment of the most concentrated form of the waste identified. Consequently, the Agency believes that the less concentrated wastes generated in the course of treatment also will be able to be treated to meet this level.

b. Applicability of BDAT to Mixtures and Other Derived-From Residues.

There is a further question as to the applicability of the BDAT treatment levels to residues generated not from treating the waste (as discussed above), but generated instead from other types of management. Examples are contaminated soil or leachate that is derived from managing the waste. In these cases, the mixture is still deemed to be the listed waste, either because of the derived-from rule, the mixture rule (§ 261.3(a)(2)(iv)), or because the listed waste is contained in the matrix (see,

e.g., § 261.33(d)). The prohibition for the particular listed waste consequently applies to this type of waste.

The Agency believes that the majority of these types of residues can meet the treatment standards for the underlying listed wastes (with the possible exception of contaminated soil and debris for which the Agency is currently investigating whether it is appropriate to establish a separate treatability subcategorization). For the most part, these residues will be less concentrated than the original listed waste. The Agency's treatability levels also make a generous allowance for process variability by assuming that all treatability values used to establish the standard are lognormally distributed (see 51 FR 40590-91, November 7, 1986). The waste also might be amenable to a relatively nonvariable form of treatment technology such as incineration. Finally, and perhaps most importantly, the rules contain a treatability variance which allows a petitioner to demonstrate that his waste cannot be treated to the level specified in the rule (see § 268.44). This provision provides a safety valve that allows persons with unusual waste matrices to demonstrate the appropriateness of a different standard. The Agency notes that to date, it has not received any petitions under this provision (for example, for residues contaminated with a prohibited solvent waste), indicating, in the Agency's view, that the existing standards are generally achievable.

8. Transfer of Treatment Standards

In today's notice, EPA is proposing some treatment standards that are not based on testing of the treatment technology of the specific waste subject to the treatment standard. Instead, the Agency determined that the constituents present in the waste can be treated to the same performance levels as observed in other wastes for which EPA has previously developed treatment data. As stated in previous BDAT rulemakings, EPA believes transferring treatment performance for use in establishing treatment standards for untested wastes is valid technically in cases where the untested wastes are generated from similar industries or from similar processing steps. As explained earlier in this preamble, transfer of treatment standards to wastes from similar processing steps requires little formal analysis because of the likelihood that similar production processes will produce a waste matrix with similar characteristics. However, in the case where only the industry is similar, EPA more closely examines the waste characteristics prior to concluding

that the untested waste constituents can be treated to levels associated with tested wastes. The Agency's method for conducting this analysis is discussed below.

EPA's undertakes a two-step analysis when determining whether wastes generated by different processes within a single industry can be treated to the same level of performance. First, EPA reviews the available data on those parameters which are expected to affect treatment selection. EPA has identified some of the most important constituents and other parameters needed to select the treatment technology appropriate for a given waste. A detailed discussion of each analysis, including how each parameter was selected for each waste, can be found in the background document for each waste.

Second, when an individual analysis suggests that an untested waste can be treated with the same technology as a waste for which treatment performance data are already available, EPA then analyzes a more detailed list of constituents that represent some of the most important waste characteristics which the Agency believes will affect the performance of the technology. By examining and comparing these characteristics, the Agency determines whether the untested wastes will achieve the same level of treatment as the tested waste. Where the Agency determines that the untested waste can be treated as well as the tested waste, the treatment standards can be transferred. A detailed discussion of this transfer process for each waste can be found in the BDAT background document for each waste or waste treatability group.

9. "No Land Disposal" as the Treatment Standard

EPA is proposing "No Land Disposal" as the treatment standard for several of the First Third wastes. This standard is analogous to the no discharge standard established as BAT (best available treatment) under the Clean Water Act's effluent guideline program. It indicates that after examining available data, the Agency has identified that: (1) The waste can be totally recycled (i.e., on-site closed-loop recycling); (2) the waste is not currently being land disposed; or (3) the waste is no longer being generated.

An alternative to establishing "No Land Disposal" as the treatment standard would be to indicate that "0" is the BDAT treatment standard (i.e., concentration level) for hazardous constituents. This appears to the Agency to be a less desirable way to proceed,

given that the analytical limit of detection is always greater than zero. Because technologies exist that make land disposal for some wastes unnecessary, and because "0" really means the analytic detection limit and not truly zero, EPA believes that specifying "No Land Disposal" as the treatment standard is a better way of expressing its intention.

The Agency notes further that it could simply allow the statutory prohibition to take effect to achieve the intended result of no land disposal. The drawback with this approach is that it allows no possibility of granting a variance from a treatment standard for those wastes that might not be amenable to the BDAT treatment. (In the absence of a treatment standard, a person would have to initially petition the Agency to establish a treatment standard for the waste, a more cumbersome and time-consuming process than applying for a variance under § 268.44.) Accordingly, the Agency believes the best way to proceed is to establish "No Land Disposal" as the treatment standard where a no discharge treatment technology is identified as BDAT.

10. Waste-Specific Treatment Standards

This section describes the development of BDAT treatment standards for all of the First Third treatability groups covered by today's rule. It includes tables showing the specific constituents regulated, as well as the treatment standards.

a. K061—Emission Control Dust/Sludge from the Primary Production of Steel in Electric Furnaces

1. Industry Affected and Waste Description. The listed waste K061 is generated in the primary production of steel in electric furnaces. The Agency estimates that approximately 85 plants produce steel in electric furnaces. These facilities are primarily located in the Eastern and North Central parts of the United States.

The primary production of steel in electric furnaces results in the generation of particulate emissions which contain hazardous constituents present in the feed materials. The particulates captured by air pollution control devices constitute the listed K061 waste.

2. Demonstrated Treatment Technologies. K061 waste consists principally of iron and zinc. In addition to zinc, other BDAT list metals of concern include lead of approximately two percent and chromium ranging from 500 ppm to 10% (by weight). The water content of the waste is approximately 10% except where wet scrubbers are used to generate this waste. The

demonstrated technologies that the Agency has identified for treatment of this waste are high temperature metals recovery and stabilization. High temperature metals recovery is currently used to recover metals such as zinc and chromium from the waste for reuse; this technology also results in the formation of a treated residual (i.e., slag) which was analyzed to determine the performance of this technology. Stabilization also is used directly to reduce the leachability of the metals in the K061 waste that has not been processed by metals recovery technology. EPA tested both of these technologies as part of the development of treatment standards for K061.

3. Data Base. The Agency has 55 data points for treatment of K061 wastes. Fifteen data points are from four facilities using high temperature metals recovery, seven of which were collected by EPA. Forty (40) data points represent the use of stabilization by two facilities, nine of which were collected by EPA.

EPA's screening of the data with regard to the design and operation of the treatment unit resulted in the deletion of twelve of the fifteen data points for high temperature metals recovery. Thirty-one of the stabilization data values were rejected because these data did not reflect testing by the TCLP procedure; the remaining nine were obtained using the TCLP and represent proper design and operation. Accordingly, these twelve data points were considered in the development of the treatment standards for K061.

4. Identification of BDAT. BDAT for K061 was determined to be high temperature metals recovery. As a result, EPA is proposing treatment standards for this waste based on the treatment residual (i.e., slag) generated by this technology.

The Agency performed an analysis of variance test for TCLP performance levels achieved by high temperature metals recovery and by stabilization. The results show that high temperature metals recovery provides significantly better reduction of lead and zinc than does stabilization, and equivalent reductions of cadmium, chromium, and mercury in the TCLP's leachate. The Agency believes that establishing high temperature metals recovery as BDAT is consistent with the national policy identified in HSWA to reduce the amount of hazardous waste generated.

The Agency is aware of at least four facilities in the United States and ten in foreign countries that use high temperature metals recovery to treat K061 waste. Therefore, EPA believes that high temperature metals recovery is demonstrated to treat K061. High

temperature metals recovery is judged to be available to treat K061 waste because (1) this treatment technology is commercially available or can be purchased from the proprietor; and (2) high temperature metals recovery provides a substantial reduction in the level of regulated constituents described above.

The question of identifying BDAT for K061 also requires some discussion of several other sets of EPA regulations relating specifically to burning hazardous wastes for materials recovery in industrial furnaces, and relating more generally to the issue of when secondary materials are RCRA solid wastes under such circumstances. The most significant issue presented is whether EPA may permissibly establish a BDAT treatment standard for the slag which results from high temperature metal recovery of this waste.

The initial question is whether electric arc steel dust is a RCRA solid and hazardous waste when it is sent to an industrial furnace for high temperature metals recovery. Under the Agency's existing regulations, this activity is classified as the type of recycling known as "reclamation" because it involves recovery of metals contained in the electric arc furnace dust (see 40 CFR 261.1(c)(4)). Because the material is a listed sludge, it is therefore defined as a solid waste under § 261.2(c)(3).

The Agency believes that this is an appropriate classification because there is a strong element of waste treatment characterizing this recycling activity: these electric arc dusts are typically landfilled, and they are not reclaimed in continuous, on-going processes, but rather in processes different from steel production (most often primary zinc smelting or some type of secondary metal recovery). Storage practices preceding reclamation of this waste also can involve direct placement on the land (for instance, in open waste piles), another indication that the electric arc dust is a waste. For a more detailed discussion, see 50 FR 641 (January 4, 1985) which presents the decision factors to determine whether sludges and byproducts should be designated as solid wastes when they are to be reclaimed. EPA has recently proposed to codify these factors, with some modifications, in its regulations (53 FR 519 and 529, January 8, 1988).

The recent opinion of the District of Columbia Circuit Court of Appeals in *American Mining Congress v. EPA* (824 F. 2d 1177) does not change this analysis. The court stated that when a generator has a secondary material of no further use to him which he discards

by giving to another person for recycling, the material is a "discarded material" within the meaning of RCRA section 1004(27). An example, as used in the opinion, is used oil given by the original generator to a second person for recycling (824 F.2d at n. 14). The electric arc furnace dust is similarly discarded by the generator when it is no longer useful to the original generator, is given to another entity for recycling, and is not recycled in the original process or even in another steel process. Thus, it is not the type of in-process, undiscarded material used in on-going, continuous processes found in the *American Mining Congress* case to be an undiscarded material (see generally, 53 FR 519, 520-521, and 522-523, January 8, 1988).

It should be noted that even if the K061 waste were not deemed to be a waste when it is reclaimed in processes unrelated to steel production, EPA still could establish BDAT standards for K061 that is being disposed, or otherwise ensure that the waste is recycled by high temperature metals recovery rather than by being land disposed. For example, the Agency could simply prohibit land disposal of the waste and indicate that high temperature metals recovery is BDAT. The Agency also could let the statutory prohibition for the waste take effect, which (as a practical matter) would have the same result.

Since the Agency can require recycling as a BDAT standard, it must consider whether it has authority to set treatment standards for the slag that results from high temperature metals recovery. The fact that K061 electric arc dust is a solid and hazardous waste when it is sent for high temperature metals recovery does not end the inquiry. The Agency has discussed in a number of preambles the question of whether a waste destined for material recovery in an industrial furnace continues to be a waste when it is actually fed into the furnace. The issue arises because industrial furnaces are normally used as essential components of industrial processes, and when they are actually burning secondary materials for material recovery can be involved in the very act of production, an activity normally beyond the Agency's RCRA authority (see 50 FR 630, January 4, 1985; 50 FR 49167, November 24, 1985; and 52 FR 16889-990, May 6, 1987). Accordingly, the Agency has stated that, even when secondary materials sent to be reclaimed in these devices are wastes before they are reclaimed; they cease to be wastes when they are actually placed in the industrial furnace for materials

recovery. To retain authority over industrial furnaces where waste treatment is a driving element of the reclamation activity, however, the Agency has further stated that the secondary material being reclaimed in the industrial furnace must be "indigenous" to that furnace for it to cease being a waste. The Agency has proposed to define "indigenous" to be any material generated by the same type of furnace in which it will be reclaimed (see the proposed § 266.30(a), 52 FR 17034, May 6, 1987). The Agency suggested other possible alternatives in the May 6 proposal, and commenters suggested additional possibilities which the Agency is now considering.

The K061 electric arc furnace dust would be considered to be indigenous, under the May 6 proposal described above, to the high temperature metals recovery furnaces used as the basis for the proposed treatment standard. This is because the metals recovery furnaces are smelting furnaces, and the electric arc furnace is also a type of smelting furnace. Consequently, the K061 dust would cease to be a solid waste when it is resmelted were the Agency to finalize the proposed definition of "indigenous". This would mean that the slag produced in the metals recovery furnace during the resmelting of the dust would no longer automatically be deemed to be a hazardous waste by virtue of the "derived-from" rule in 40 CFR 261.2(c), because it would no longer derive from treatment of a listed hazardous waste (the K061 waste would no longer be a hazardous waste at the moment of burning). Thus, the slag would be a hazardous waste only if it exhibited a characteristic of hazardous waste. (Depending upon the type of device doing the smelting, and the feed materials to that device, the slag might also presently be excluded from regulation as a waste from the mining, beneficiation or processing of an ore or mineral (see 52 FR 17012, May 6, 1987).) Under these circumstances, the Agency probably could not set treatment standards for the slag which does not exhibit a characteristic of hazardous waste (which would be the case for all of the slags the Agency sampled in evaluating BDAT for this waste), since the land disposal prohibitions apply only to "hazardous wastes". In addition, any prohibition for slag exhibiting a characteristic of hazardous waste would take effect on May 8, 1990, as a Third Third waste.

Thus, although the Agency has proposed treatment standards based on total and leachable metal concentrations in the slag, EPA solicits

comment on these issues with the view that EPA will likely establish either "total recycle" or "no land disposal" as the treatment standard for K061 should it determine not to set treatment standards for the slag.

There is one further issue relating to this waste. Electric arc furnace dust is frequently recycled by being used as an ingredient in fertilizers, the end result being that the dust is placed directly on the land when the fertilizer is applied. Under the Agency's rules, both the electric arc furnace dust and the resulting waste-derived fertilizer are hazardous wastes (see 40 CFR 261.2(c)(1)). The recycling activity is an example of the "use constituting disposal" category of recycling. The *American Mining Congress* opinion does not affect the material's status as a solid waste because the recycling activity contains an element of discard: it is like a form of land disposal. The court in fact characterized a "use constituting disposal" recycling situation (direct reuse of a pesticide drum as a trash can) as a type of disposal involving solid waste (see 53 FR 521-522, January 8, 1988).

EPA's rules presently exempt the K061-derived fertilizer from substantive regulation. Because this exemption is contained in Part 261, K061 waste that is recycled in this way is also exempt from the land disposal prohibitions (see 40 CFR 268.1). The Agency solicits comment whether these fertilizers should be exempt from the land disposal prohibitions program. In choosing to exempt the fertilizers from regulation, the Agency indicated it was doing so only until it could determine an appropriate regulatory regime for the fertilizers (50 FR 647, January 4, 1985). Since the fertilizers could contain high concentrations of mobile toxic metals (materials in the record of the solid waste definition rulemaking now incorporated into the record for this proposed rule show high concentration levels of lead and cadmium in some of these waste-derived fertilizers), EPA was certainly not crafting an exemption based on an Agency determination that there would be no risk from applying these fertilizers. Consequently, the issue now facing the Agency is whether to continue the exemption which would allow this waste to be recycled in a manner arguably at odds with the statutory land disposal prohibitions provisions, by allowing continued placement of untreated hazardous waste on the land. Furthermore, the Agency has identified another type of recycling of this waste which does not involve placement of the waste on the land as

the basis for BDAT, so that any regulations which discourage use of the electric arc furnace dust in fertilizer would channel the waste to a (at least arguably) more environmentally beneficial type of recycling. The Agency consequently solicits comment on whether these waste-derived fertilizers should be subject to the land disposal restrictions and to the treatment standards, effective on the same date as all other prohibitions applicable to K061.

5. Regulated Constituents and Treatment Standards. The proposed regulated constituents for K061 are listed below. The Agency is proposing that facilities must comply with both the composition and TCLP values of slag resulting from high temperature metals recovery. EPA believes that both measures of performance are necessary to adequately reflect BDAT-type treatment because available data show that facilities could achieve the total constituent concentration in the slag and still have a high leachate value because of poor operation of the treatment system. The Agency is aware that requiring the waste to meet both measures will eliminate the possibility of using stabilization alone to meet the treatment standard in most, if not all, cases. The Agency is specifically asking for comment on the use of both measures (as opposed to only one). (As discussed above, however, the Agency also is soliciting comment on whether it should set treatment standards for the slag, or find an alternative regulatory means of ensuring that treatment residues achieve total concentration and leachable metal concentrations achievable by high temperature metals recovery.)

EPA is proposing "No Land Disposal" as the treatment standard for K061 wastewaters because the Agency is not aware of any such waste being generated. The establishment of such a "treatment standard" results in the same effect as a prohibition, only it allows for the possibility of a variance from this treatment standard in case such a waste is generated.

For K061 nonwastewaters, EPA proposes the following treatment standards:

BDAT TREATMENT STANDARDS FOR K061
(Nonwastewater)

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Cadmium	44.0	0.19
Total chromium	1730.0	0.33

BDAT TREATMENT STANDARDS FOR K061—Continued

(Nonwastewater)

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Lead	20,300.0	0.09
Mercury	0.28	0.02
Zinc	24,100.0	0.50

b. K062—Spent Pickle Liquor Generated by Steel Finishing Operations of Facilities Within the Iron and Steel Industry (SIC Codes 331 and 332)

1. Industries Affected and Waste Description. The listed waste K062 is generated by the iron and steel industry (SIC Codes 331 and 332) from steel finishing operations. The Agency estimates that 978 facilities have steel finishing operations that may be generating the listed waste K062. These facilities are primarily located in the Eastern and North Central portions of the U.S.

In steel finishing operations, oxide scale on steel products is removed with a heated solution of concentrated acid or acids in a process called pickling. When the acid solution (called pickle liquor) loses its effectiveness through use, it is referred to as "spent". This is the listed K062 waste.

2. Demonstrated Treatment Technologies. K062 waste contains 4 BDAT metals at significant concentrations, has a dissolved solids of approximately 12 percent, and a water content of approximately 85 percent. The BDAT metals are chromium, nickel, copper, and lead with approximate respective concentrations of 7000, 3000, 400, and 200 ppm. The technology that the Agency has identified to treat this waste consists of a preliminary step for reduction of hexavalent chromium followed by chemical precipitation and some form of solids removal and dewatering, which may include settling and/or mechanical operations such as vacuum filtration. The metals in the precipitated solids may be treated by stabilization to reduce their leachability or high temperature metals recovery.

A comment received on the August 12, 1987 Notice of Data Availability and Request for Comments (52 FR 29992) suggested that K062 can be treated by high temperature metals recovery. The Agency, therefore, is including high temperature metals recovery as a demonstrated technology for K062 wastewaters and nonwastewaters. EPA requests comment on the types and quantities of K062 wastes treated by

recovery technologies, and specifically asks for data describing the performance achievable by metals recovery. Upon review of those data, the Agency may promulgate final standards based on metals recovery.

The specific technology that the Agency tested for K062 consisted of chromium reduction, chemical precipitation with lime and sulfide and vacuum filtration.

3. Data Base. (i) Wastewaters. The Agency has collected 11 data points from one facility using the treatment system noted above. All 11 data points represent a well-designed and well-operated treatment system and were used in the development of treatment standards. The Agency has extensive data on wastewaters that would be classified as K062 under the "derived from" rule, but these data were not used. EPA determined that these untreated waste concentrations were considerably lower than K062 as generated, and therefore, not fully representative of K062. That is, treatment standards based on treating these unconcentrated residues might not be achievable for the more concentrated K062, as generated.

(ii) Nonwastewaters. The Agency has 11 TCLP data points for nonwastewaters (dewatered sludges) generated at the same facility where the wastewater test was conducted. The sludges were generated by lime and sulfide precipitation and dewatering the sludge with vacuum filtration. Because all 11 data points appear to represent well-designed and well-operated treatment, none of the points were excluded from the development of the treatment standards.

4. Identification of BDAT. BDAT for K062 was determined to be chromium reduction followed by chemical precipitation and vacuum filtration. This technology is a well demonstrated wastewater treatment technology that is used at numerous facilities throughout the country. Therefore, EPA believes that this technology is demonstrated to treat K062 waste. The Agency has no data for treatment of this waste using any other technology.

This treatment technology is judged to be available to treat K062 waste because (1) this treatment technology is commercially available or can be purchased from the proprietor; and (2) this treatment technology provides a substantial reduction of hazardous constituents.

5. Regulated Constituents and Treatment Standards. The regulated constituents for K062 and the treatment standards for wastewater and nonwastewater are listed below. EPA's

rationale for selection of the regulated constituents is presented in the *BDAT Background Document for First Third Wastes—K062*. For reasons presented in Section III. A. 7., the standards shown below apply to all K062 wastewaters and nonwastewaters with the following exception. Under 40 CFR 261.3(c)(2)(ii), residues generated as a result of lime (Ca(OH)₂) treatment are not hazardous wastes and, therefore, any such dewatered residues would not have to comply with the treatment standards. The treatment standards do apply, however, to residues generated by other than lime precipitation.

BDAT TREATMENT STANDARDS FOR K062 (NONWASTEWATER)

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Metals:		
Total chromium.....	1	0.094
Lead.....	1	0.37

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K062 (WASTEWATER)

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Metals		
Total chromium.....	0.32	1
Copper.....	0.42	1
Nickel.....	0.44	1
Lead.....	0.04	1

¹ Not applicable.

- c. K016—Heavy Ends or Distillation Residues from the Production of Carbon Tetrachloride
K018—Heavy Ends from the Fractionation in Ethyl Chloride Production
K019—Heavy Ends from the Distillation of Ethylene Dichloride Production
K020—Heavy Ends from the Distillation of Vinyl Chloride in Vinyl Chloride Monomer Production
K030—Column Bottoms or Heavy Ends from the Combined Production of Trichloroethylene and Perchloroethylene

1. Industries Affected and Waste

Descriptions. These five listed hazardous wastes are generated in the production of chlorinated chemicals in the organic chemical industry. The Agency estimates that there are 52

plants which may produce the listed wastes. These facilities are located primarily in the south central portion of the United States. Brief descriptions of processes which may generate each of the listed wastes are given below.

Carbon tetrachloride is produced commercially via the chlorination of hydrocarbon and/or chlorocarbon feedstocks, methane, or carbon disulfide. The distillation of the crude carbon tetrachloride results in distillation residues (heavy ends). These distillation residues are the listed waste K016.

Ethyl chloride is produced commercially by the catalytic hydrochlorination of ethylene. Crude ethyl chloride is further refined by fractionation. The heavy ends from the fractionation column composes the listed waste K018.

Ethylene dichloride is produced separately or by a combined process involving the chlorination of ethylene and the oxychlorination of ethylene via hydrogen chloride. The process includes the distillation of the crude ethylene dichloride which results in distillation bottoms (heavy ends) which contain treatable quantities of organic constituents. These distillation bottoms are the listed waste K019. It should not be noted that the May 28, 1986 schedule for restricting the listed hazardous wastes from land disposal (51 FR 1900) lists K019 in the second third of listed wastes. Therefore, K019 was not originally scheduled for regulation under 40 CFR Part 268 until June 8, 1989. However, due to the similarity between K019 and the other wastes in this treatability group, the Agency has chosen to accelerate the schedule for this waste, and will address K019 in this proposed rulemaking.

Vinyl chloride monomer is produced by the thermal cracking of ethylene dichloride or the hydrochlorination of acetylene. The process includes the purification of crude vinyl chloride monomers via distillation which results in heavy ends. The heavy ends compose the listed waste K020.

The combined production of perchlorethylene and trichloroethylene is accomplished by the direct chlorination or oxychlorination of ethylene dichloride or other chlorinated ethane or ethylene feedstocks. The listed waste K030 is generated when recycled streams from the chlorination or oxychlorination processes become contaminated and must be removed and disposed.

2. *Demonstrated Treatment Technologies.* The K016, K018–K020, K030 waste group generally contains 5 percent water, 5 percent chlorinated

organic constituents and 90 percent other nonchlorinated organic constituents. These wastes generally contain high levels of filterable solids. The technologies that the Agency has identified for treatment of these wastes are (1) incineration technologies including rotary kiln and fluidized bed incineration and (2) solvent extraction followed by stabilization or high temperature metal recovery for metals. Fluidized bed incineration or rotary kiln incineration is a destruction technology applicable to organic bearing wastes with solids concentrations that prevent use of liquid injection incineration. Solvent extraction removes organic constituents from a waste by exploiting the relatively high solubilities of the waste constituents in a particular solvent.

The Agency tested rotary kiln incineration for treatment of this treatability group. The Agency also considered testing fluidized bed incineration of this waste; however, EPA was unable to identify any facilities that were incinerating these wastes in a fluidized bed incinerator.

3. *Data Base—i. Nonwastewaters.* For waste code K019, the Agency has six untreated and treated data points from one plant. These data sets include both total constituent concentration and TCLP leachate values. All data sets were used in the development of the treatment standards because data show that the unit was properly operated during the time the waste was treated.

For K016, K018, K020, and K030, the Agency has data characterizing the constituents for each waste code from sampling and analysis conducted by EPA's hazardous waste listing program. Due to the physical and chemical similarity between these wastes and K019, treatment standards from waste code K019 are being transferred to waste codes K016, K018, K020, and K030. (EPA's analysis regarding the transfer of treatment standards can be found in the *BDAT Background Document for Chlorinated Organics*, Volume III. There is also a discussion in Section III. A. 8. in this preamble.)

ii. *Wastewaters Generated from Incineration.* The Agency has six scrubber water data points which represent destruction of BDAT organic compounds in the afterburner of the rotary kiln incinerator. The data reflect total constituent analyses; all data were used in the development of treatment standards because data collected by EPA during treatment showed that the afterburner was properly operated during the treatment test.

4. *Identification of BDAT.* BDAT for waste group K016, K018-K020, K030 was determined to be rotary kiln incineration. This technology was the only technology for which the Agency has treatment data as noted in the previous subsection (Data Base). The Agency believes, however, that a well designed and operate fluidized bed incineration will meet the BDAT standards. While a rotary kiln incinerator generally operates at higher temperatures and longer residence times, the increased turbulence (mixing) of a fluidized bed incinerator should allow this technology to achieve the same results. Accordingly, EPA will include fluidized bed incineration in its capacity estimates for K016, K018-K020, and K030.

Incineration is demonstrated at over 250 facilities and the Agency is aware of two facilities that use rotary kiln incineration to treat K019 waste. Therefore, the Agency believes incineration is demonstrated to treat K019. The Agency also believes this technology is available because (1) incineration technologies are commercially available or can be purchased from a proprietor; and (2) incineration provides substantial reduction of the concentration of organic hazardous constituents. For a detailed description of the reductions exhibited by treatment of these wastes, refer to the *BDAT Background Document for First Third Wastes—K016, K018-K020, K030*.

5. *Regulated Constituents and Treatment Standards.* Below are listed the regulated constituents for K016, K018-K020, K030 and the treatment standards for wastewaters and nonwastewaters. For reasons discussed earlier in this preamble, the treatment standards apply to all wastewaters and nonwastewaters classified as K016, K018, K019, K020, and/or K030.

BDAT TREATMENT STANDARDS FOR K016

(Nonwastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Tetrachloroethene	5.96	(¹)
Hexachlorobenzene	27.2	(¹)
Hexachlorobutadiene	5.44	(¹)
Hexachlorocyclopentadiene	5.44	(¹)
Hexachloroethane	27.2	(¹)

¹ Not applicable

BDAT TREATMENT STANDARDS FOR K016

(Wastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Tetrachloroethene	0.007	(¹)
Hexachlorobenzene	0.033	(¹)
Hexachlorobutadiene	0.007	(¹)
Hexachlorocyclopentadiene	0.007	(¹)
Hexachloroethane	0.007	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K018

(Nonwastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Chloroethane	5.96	(¹)
1,1-Dichloroethane	5.96	(¹)
1,2-Dichloroethane	5.96	(¹)
1,1,1-Trichloroethane	5.96	(¹)
Hexachlorobenzene	27.2	(¹)
Hexachloroethane	27.2	(¹)
Hexachlorobutadiene	5.44	(¹)
Pentachloroethane	5.44	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K018

(Wastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Chloroethane	0.007	(¹)
Chloromethane	0.007	(¹)
1,1-Dichloroethane	0.007	(¹)
1,2-Dichloroethane	0.007	(¹)
1,1,1-Trichloroethane	0.007	(¹)
Hexachlorobenzene	0.033	(¹)
Hexachlorobutadiene	0.007	(¹)
Pentachloroethane	0.007	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K019

(Nonwastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Chloroform	5.96	(¹)
1,2-Dichloroethane	5.96	(¹)
Tetrachloroethane	5.96	(¹)
1,1,1-Trichloroethane	5.96	(¹)
Bis(2-chloroethyl)ether	5.44	(¹)
Hexachloroethane	27.2	(¹)
Naphthalene	5.44	(¹)
Phenanthrene	5.44	(¹)
1,2,4-Trichlorobenzene	18.7	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K019

(Wastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Chlorobenzene	0.006	(¹)
Chloroform	0.007	(¹)
1,2-Dichloroethane	0.007	(¹)
Tetrachloroethane	0.007	(¹)
1,1,1-Trichloroethane	0.007	(¹)
Bis(2-chloroethyl)ether	0.007	(¹)
p-Dichlorobenzene	0.008	(¹)
Hexachloroethane	0.033	(¹)
Naphthalene	0.007	(¹)
1,2,4,5-Tetrachlorobenzene	0.017	(¹)
1,2,4-Trichlorobenzene	0.023	(¹)
Fluorene	0.007	(¹)
Phenanthrene	0.007	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K020

(Nonwastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
1,2-Dichloroethane	5.96	(¹)
1,1,2,2-Tetrachloroethane	5.44	(¹)
Tetrachloroethane	5.96	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K020

(Wastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
1,2-Dichloroethane	0.007	(¹)
1,1,2,2-Tetrachloroethane	0.007	(¹)
Tetrachloroethane	0.007	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K030

(Nonwastewater)		
Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Tetrachloroethene	5.96	(¹)
Hexachlorobutadiene	5.44	(¹)
Hexachloroethane	27.2	(¹)
Hexachloronopropene	18.7	(¹)
Pentachlorobenzene	27.2	(¹)
Pentachloroethane	5.44	(¹)
1,2,4,5-Tetrachlorobenzene	13.6	(¹)
1,2,4-Trichlorobenzene	18.7	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K030

(Wastewater)

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Tetrachloroethene	0.007	(¹)
Hexachlorobutadiene	0.007	(¹)
Hexachloroethane	0.033	(¹)
Pentachloroethane	0.007	(¹)
1,2,4,5-Tetrachlorobenzene.....	0.017	(¹)
1,2,4-Trichlorobenzene	0.023	(¹)
o-Dichlorobenzene	0.008	(¹)
p-Dichlorobenzene.....	0.008	(¹)

¹ Not applicable.

d. K024—Distillation Bottoms from the Production of Phthalic Anhydride from Naphthalene

1. Industries Affected and Waste Description. The listed waste K024 is generated in the production of phthalic anhydride from naphthalene in the organic chemical industry. The Agency believes that only one facility produces phthalic anhydride using naphthalene as a feed stock.

The manufacturing process includes the distillation of crude phthalic anhydride which results in distillation bottoms (heavy ends) which contain treatable levels of organic constituents. The distillation bottoms are the listed waste K024.

2. Demonstrated Treatment Technologies. The listed waste K024 has a high organic solids concentration with phthalic anhydride as the principal BDAT constituent. The demonstrated technologies that the Agency has identified for treatment of this waste are incineration technologies including fluidized bed and rotary kiln incineration. Fluidized bed incineration and rotary kiln incineration are destruction technologies demonstrated for organic bearing wastes with solids concentrations that prevent liquid injection incineration.

The Agency tested rotary kiln incineration for K024. EPA did not locate any facilities using fluidized bed incineration for K024.

3. Data Base. i. Nonwastewaters. For waste code K024 the Agency has treatment data from one plant. At this plant, the Agency has 6 data points representing residual concentrations found in the ash from rotary kiln incineration. These data reflect

composition and TCLP analysis of organics.

ii. Wastewaters Generated from Incinerator. The Agency has six scrubber water data points which represent destruction of BDAT organic compounds in the afterburner of the rotary kiln incinerator. These data reflect total constituent analyses.

4. Identification of BDAT. BDAT for K024 waste was determined to be rotary kiln incineration. This technology was the only technology for which the Agency has treatment data as noted in the previous section (Data Base).

Rotary kiln incineration is demonstrated at over 50 facilities. The Agency is not aware of any generator or TSDF facilities currently using rotary kiln incineration for treatment of K024. However, EPA believes rotary kiln incineration is demonstrated for K024 in that it is being used to treat wastes similar to K024 with regard to parameters affecting treatment selection for K024, including low water content and high organic solids concentration. EPA has confirmed this judgement by demonstrating the actual performance achievable when K024 was incinerated in EPA's own in-house rotary kiln.

Rotary kiln incineration is judged to be available to treat K024 because (1) this technology is commercially available and (2) rotary kiln incineration provides a substantial reduction in the concentration of BDAT organic constituents present in K024. For a detailed description of the reductions exhibited by treatment of these wastes, refer to the *BDAT Background Document for First Third Wastes—K024*.

While EPA does not have performance data for technologies other than rotary kiln incineration, the Agency believes that a well designed and operated fluidized bed incinerator will also achieve the treatment standards. For the reasons presented in the discussion of the K016, K018–K020, and K030 treatability group, EPA will consider fluidized bed incineration in its capacity determinations.

5. Regulated Constituents and Treatment Standards. As noted below, EPA is regulating phthalic acid for K024. This constituent, although not listed as a hazardous constituent in Part 261 Appendix VIII, is being regulated as a surrogate for phthalic anhydride. Phthalic anhydride is a hazardous constituent; however, it cannot be easily analyzed, in that, the analytical method

readily hydrolyzes the compound to phthalic acid. The treatment standards for all K024 wastewaters and nonwastewaters are presented below.

BDAT TREATMENT STANDARDS FOR K024

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Phthalic acid.....	6.0	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K024

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Phthalic acid.....	0.08	(¹)

¹ Not applicable.

e. K103—Process Residues from Aniline Extraction from the Production of Aniline

K104—Combined Wastewater Streams Generated from Nitrobenzene/Aniline Production

1. Industries Affected and Waste Description. The listed wastes K103 and K104 are generated by production of aniline and from the combined production of aniline/nitrobenzene, respectively. The Agency estimates that six facilities in the central and eastern states are actively involved in aniline production which could generate K103. Four of these facilities are actively co-producing aniline and nitrobenzene, which also could result in the generation of K104 waste.

2. Demonstrated Treatment Technology. The K103 wastewater primarily consists of water (94.7 percent) and aniline (4.3 percent). The K104 wastewater principally consists of water (98.7 percent), nitrobenzene (0.3 percent), and small amounts of cyanides. For both K103 and K104 wastewater the Agency believes the following treatment technology train is demonstrated; solvent extraction, which separates the organic components from the aqueous components by exploiting the relatively high solubilities of the organic constituents in the particular solvent; steam stripping, which further

removes organics from the liquid phase through volatilization; and activated carbon adsorption, which uses carbon granules to remove contaminants. The solvent-containing stream from solvent extraction potentially can be recycled to recover nitrobenzene and aniline, or incinerated. The steam stripper overheads are condensed and decanted with the organic constituents recycled back to the process. The spent carbon from the activated carbon adsorption column is sent off-site for thermal regeneration. While the incineration component of this technology is not demonstrated for K103 and K104, available information shows that it is demonstrated on wastes similar to the contaminated solvent stream from extraction. Because the solvent-contaminated stream potentially contains a significant amount of an explosive compound (picric acid), EPA is concerned that it may not be possible to safely use incineration. Accordingly, the Agency seeks comment regarding its determination that the incineration component of BDAT for K103 and K104 is demonstrated.

Other treatment technologies which may be applicable to K103 and K104 are steam stripping followed by activated carbon adsorption, and steam stripping followed by biological treatment which involves the use of microorganisms to degrade organic compounds.

The technology tested by the Agency was the system consisting of solvent extraction followed by steam stripping and activated carbon adsorption. The three-step treatment train was chosen over applicable two-step treatment processes because the incremental solvent extraction step provides additional reduction in the level of organics.

3. Data Base. The Agency has 5 data points for treated and untreated K103 and K104 wastes from one facility. Data collected during the test show that one of the 5 data points did not reflect proper operation; therefore, this value was not included in the calculation of the treatment standards.

4. Identification of BDAT. BDAT for K103 and K104 wastes was determined to be solvent extraction followed by steam stripping and activated carbon adsorption. Additionally, BDAT includes incineration of the solvent-contaminated stream from the extraction component of the treatment train. The Agency is aware of at least one facility that has used the wastewater technology train to treat K103 and K104. Therefore, EPA believes that the extraction, followed by steam stripping and activated carbon adsorption is demonstrated on K103 and

K104. Additionally, these units are widely used to treat wastes having similar parameters affecting treatment selection.

This three-step treatment system is judged to be available to treat K103 and K104 because (1) the treatment system is commercially available; and (2) the system provides a substantial reduction in the K103 and K104 constituents described above.

5. Regulated Constituents and Treatment Standards. Below are listed the regulated constituents for K103 and K104. The following treatment standards apply to all wastewaters and nonwastewaters. In the case of K103 and K104 nonwastewaters, the treatment standards have been transferred as discussed in Section III. A. 8. of this preamble.

BDAT TREATMENT STANDARDS FOR K103 AND K104

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP(mg/l)
Aniline	5.44	(1)
Benzene	5.96	
2,3-Dinitrophenol	5.44	
Nitrobenzene	5.44	
Phenol	5.44	
Total cyanides (for K104 only)	1.48	

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K103 AND K104

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Benzene	0.147	(1)
Aniline	4.450	
2,3-Dinitrophenol	0.613	
Nitrobenzene	0.073	
Phenol	1.391	
Total Cyanides (for K104 only)	2.683	

¹ Not applicable.

f. K071—Brine Purification Muds from the Mercury Cell Process in Chlorine Production, where Separately Prepurified Brine is Not Used

1. Industries Affected and Waste Description. The listed waste K071 is generated in chlorine production by the mercury cell process where prepurified brine is not used. The Agency estimates that there are 14 facilities that use this

process and do not use prepurified brine as a raw material. These facilities are distributed throughout the country, with 50 percent being located in the Southeast.

Chlorine is produced by the electrolytic decomposition of a saturated sodium chloride brine solution. The principal raw material is the rock salt that contains impurities that dissolve in the brine. Treatment of the saturated brine to remove these impurities results in a treatment residual, which is listed as K071.

2. Demonstrated Treatment Technologies. K071 waste consists primarily of sodium chloride, calcium sulfate, and calcium carbonate; the principal BDAT constituent of this waste being mercury. The water content of the waste is over 60 percent and the filterable solids content is 20–35 percent (for a detailed analysis of this waste stream, see the *BDAT Background Document for First Third Wastes—K071*). The demonstrated technologies that the Agency has identified to treat K071 nonwastewaters are (1) a treatment train consisting of acid leaching followed by chemical oxidation followed by a washing and dewatering step for solids, (2) water washing followed by a dewatering step, and (3) stabilization for nonwastewaters. For wastewaters, EPA has identified chemical precipitation followed by filtration. Acid leaching followed by chemical oxidation converts the mercury present in the waste to a soluble form, which is separated from the solid portion of the waste by washing and dewatering. The solid portion is regulated under this rule as a treated K071 waste. The filtrate is then treated by chemical precipitation and filtration to remove the mercury solubilized in the leaching and oxidation steps; the filtrate from this step is regulated under this rule as a treated K071 waste. The precipitated residue, however, is another listed waste, K106.

Of the technologies described above, the Agency tested acid leaching and chemical oxidation followed by dewatering and washing, followed by sulfide precipitation and filtration. The Agency did not test stabilization because it does not reduce the total concentration of the mercury as does acid leaching and chemical oxidation.

3. Data Base. i. Wastewaters. The Agency has three data points from one facility on treated wastewaters. This facility was tested by EPA and the treatment consisted of sulfide precipitation followed by filtration. Data collected during treatment show that all treated data represent proper operation;

accordingly, all data were used in the development of the standards.

ii. Nonwastewaters. The Agency has 44 data points from 3 facilities representing total constituent concentration of the treated K071 nonwastewater, 10 data points from 2 facilities representing mercury concentrations found in the TCLP leachate of the treated K071 nonwastewater, and 268 data points from 3 facilities representing mercury concentrations in the leachate from the Extraction Procedure (EP) test. The Agency has 44 data points from 3 facilities providing total mercury concentration values for treated K071 nonwastewaters. Of these 44, seven were generated by EPA testing acid leaching followed by chemical oxidation and a washing and dewatering step. EPA also generated one data point using a technology consisting of a one-step acid leaching process. This technology was used to treat a waste defined as K071, but significantly less contaminated with mercury and also having larger particle sizes. The 36 data points submitted by two facilities represent treatment using a water wash/dewatering process.

Of the 10 data points reflecting TCLP analysis, eight were generated by EPA using the treatment technologies described above. The remaining two data points representing TCLP analysis were submitted by one of the facilities using the water wash/dewatering process mentioned above.

The 268 EP leachate data points were submitted to EPA by three facilities using the water wash/dewatering process. Two of the three facilities are the same companies that supplied the total mercury concentration and TCLP values for the treated K071.

EPA did not use the 268 EP data points in the development of the treatment standards because data reflecting performance as measured by the TCLP are available. The TCLP is a better measure of evaluating BDAT in this case because it is a more aggressive leachate test than the EP (Extraction Procedure). All remaining data were considered using the Agency's statistical test (ANOVA) for comparing different treatment technologies.

4. Identification of BDAT. BDAT for K071 was identified as acid leaching and chemical oxidation followed by washing/dewatering for nonwastewaters and sulfide precipitation followed by filtration for wastewaters. For nonwastewaters, EPA compared the mean value of the data representing acid leaching and chemical

oxidation and washing/dewatering to the mean value of the treatment data from the water washing process. This comparison was done using the analysis of variance test for both the total constituent and TCLP data. In both instances, the acid leaching/chemical oxidation process was shown to provide significantly better treatment.

The BDAT treatment train for nonwastewaters is demonstrated at two facilities; additionally the various treatment components are well-demonstrated on wastes similar to K071 with regard to parameters used to select treatment. The Agency believes that this technology is available to treat K071 wastes because (1) this technology is commercially available, and (2) this technology provides substantial reduction of hazardous constituent concentrations.

5. Regulated Constituents and Treatment Standards. Below are listed the regulated constituents and associated treatment standards for K071 wastewater and nonwastewater. Facilities that land dispose of nonwastewaters have to comply with both the total concentration and the TCLP value.

BDAT TREATMENT STANDARDS FOR K071

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Mercury	4.6	0.0025

BDAT TREATMENT STANDARDS FOR K071

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Mercury	0.030	¹

¹ Not applicable.

g. K048—Dissolved Air Flotation (DAF) Float from the Petroleum Refining Industry

K049—Slop Oil Emulsion Solids from the Petroleum Refining Industry

K050—Heat Exchanger Bundle

Cleaning Sludge from the Petroleum Refining Industry

K051—API Separator Sludge from the Petroleum Refining Industry

K052—Tank Bottoms (Leaded) from the Petroleum Refining Industry

1. Industries Affected and Waste Descriptions. The above five listed hazardous wastes are generated by the petroleum refining industry. The Agency estimates that there are 200 refineries which may produce the listed wastes K048 through K052. Many of these facilities are located in the South Central and Pacific areas of the United States.

Petroleum refining consists of many unit operations, the configuration of which depends on the refinery and the desired finished products. Many sources of waste exist throughout the refining process. Treatment of these wastes in a centralized wastewater treatment system and other unit operations result in the generation of the K048-K052 waste as described below:

Dissolved air flotation (DAF) is used by petroleum refineries for separating suspended and colloidal materials from process wastewater, including suspended solids and insoluble oily wastes. The material skimmed from the surface of a DAF unit is the listed waste K048.

Process wastewater from refining operations is in many cases treated in an oil/water/solids separator where the waste separates by gravity into a multiphase mixture. The skimmings from the separator are collected in a "slop oil system," where the three phases, water, oil, and an emulsified layer, are separated. The emulsified layer is the listed waste K049.

Heat exchanger bundles (tubes) from petroleum refining operations are periodically cleaned to remove deposits of scale and sludge. The solids resulting from this cleaning operation are listed as K050.

API separators are used in petroleum refining operations to remove floating oil and suspended solids from the wastewater. Solids that settle out of the water are the listed waste K051.

Storage tanks which have contained leaded petroleum products are periodically cleaned to remove deposits. The solids resulting from this cleaning operation are listed as K052.

2. Demonstrated Treatment Technologies. The K048-K052 waste group generally contains high percentages of water, oil, and sand and

other solids; the concentration ranges of these constituents vary considerably, depending upon the particular waste. BDAT organic and metal constituents generally comprise less than one percent of the waste stream. For a detailed analysis of these wastes see the *BDAT Background Document for First Third Wastes—K048–K052*. The demonstrated technologies that the Agency has identified for treatment of these wastes are: incineration technologies including fluidized bed and rotary kiln incineration; solvent extraction followed by recovery or incineration of the contaminated solvent; thermal drying; and pressure filtration followed by oil recovery from the filtrate. These technologies provide varying degrees of treatment of the organic constituents present in the waste.

Fluidized bed incineration or rotary kiln incineration are destruction technologies which destroy the organic components in the waste feed. Solvent extraction removes organic constituents from a waste by exploiting the relatively high solubilities of the waste constituents in a particular solvent. Thermal drying removes water and volatile organics through the application of heat. Pressure filtration mechanically separates solids from liquids allowing the oils in the liquid phase to be recovered; further treatment being required for the wastewater stream.

All of the organic treatment technologies generate both nonwastewater and wastewater residuals that require treatment for metals. For metals in the nonwastewater residuals, EPA has determined stabilization to be demonstrated. Stabilization immobilizes the metal constituents to minimize migration.

For metals in the wastewater residuals, EPA has identified chromium reduction followed by chemical precipitation and, finally, stabilization of the precipitated residuals as demonstrated technologies. These technologies are commonly employed for metal-containing wastewaters. Chromium reduction reduces hexavalent chromium to the less toxic trivalent form. Chemical precipitation transfers metals from the wastewater to a sludge form suitable for stabilization.

The Agency tested fluidized bed incineration for the K048–K052 waste group. Additionally, stabilization of the residual ash was selected for testing because metal stabilization forms chemical bonds or a lattice structure that minimizes the ability of a metal to leach. Stabilization testing was performed at an EPA test facility since no commercial facilities were identified performing stabilization of these wastes.

Rotary kiln incineration was considered for testing; however, the Agency was not aware of any generator facilities treating these K048–K052 wastes using a rotary kiln incinerator. The other technologies applicable to these wastes were not selected for testing for the following reasons. Solvent extraction was not tested because it results in a residual that may subsequently require incineration to reduce the levels of organics in the waste to be disposed. Even though thermal drying operates on the same principle as incineration (the application of energy in the form of heat to volatilize organic constituents from the waste), it would not be expected to perform better than fluidized bed incineration since it is operated at significantly lower temperatures (250–550 °F versus 1200–1400 °F). Therefore, thermal drying was not selected for testing. Pressure filtration physically separates solids and liquids and would provide for the removal of the organics in the liquid portion of the waste but would not remove organics present in the solids. Therefore, pressure filtration would not be expected to perform better than fluidized bed incineration. Metals recovery technologies were not tested because the Agency was not aware at the time of any facilities performing metals recovery on these wastes.

3. Data Base. For wastes K048 and K051, the Agency collected data from one facility. These data consist of six untreated and treated data points representing fluidized bed incineration. Operating data collected during the testing of the incinerator show that the technologies were properly operated; accordingly, all of the above described data were used in the development of the treatment standards.

For wastes K048, K049, K051, and K052 the Agency also has substantial treatment data from industry. Most of the data addressing BDAT organic constituents reflect performance as measured in the leachate from the TCLP; EPA did not evaluate these data because the Agency is proposing treatment standards based on the total constituent concentration. These data represent a range of demonstrated treatment systems including solvent extraction, thermal drying, and pressure filtration. To the extent that total composition data become available, EPA will evaluate these systems prior to promulgation.

EPA also received total composition data from one facility representing 10 data points for residuals from solvent extraction. EPA compared these data to treatment data obtained by fluidized bed incineration and found that

fluidized bed incineration provided significantly better treatment for most of the constituents.

For wastes K049 and K052 the Agency has data characterizing the constituents of these wastes from one plant. Using these data, EPA confirmed its judgement that these wastes were similar to the treated waste (because of similar generation processes) through use of the analyses described earlier in this section of the preamble.

For K050 waste, the Agency does not have data that represents an analysis of all BDAT organic and metal constituents. However, the Agency does have a limited analysis of BDAT organics and metals from one facility. Based on these data and information regarding the generation of this waste, EPA believes it would be similar in composition to wastes K048 and K051, and therefore, EPA transferred treatment standards to this waste.

For metals in the incinerator ash, the Agency has 9 treated data points representing the amount of metals found in the TCLP leachate after stabilization from one facility. Operating data collected during this testing show that the technology was properly operated; accordingly, all of the data were used in the development of the treatment standards.

EPA received 10 data points from industry representing metals stabilization. EPA did not use these data in the development of treatment standards for the BDAT metals because the TCLP values in the untreated and treated waste did not show treatment to occur (i.e., there was no indication of reductions in the leachate concentrations).

Fluidized bed incineration also generates a scrubber water stream. EPA currently has no data on BDAT list organics in this residual that specifically reflects treatment of K048–K052 wastes. The Agency does have six scrubber water residual data points generated from incineration of wastes that EPA believes are similar to K048–K052 relative to the level of performance that can be achieved. Operating data collected during this testing show that the technology was properly operated; accordingly, all of the data were used in the development and transfer of treatment standards.

EPA does not have data that specifically reflect metal wastewater treatment of K048–K052. The Agency does have performance data, however, on wastes that it believes are sufficiently similar to K048–K052 such that the level of performance can be transferred. These data consist of 11

untreated and treated analyses for each of the following metals: chromium, lead, and zinc. The data were collected by EPA from one facility using chromium reduction followed by lime and sulfide precipitation and, finally, vacuum filtration. Operational data collected during this treatment testing indicate that the technology was properly operated; accordingly, all of the data were used in the development and transfer of treatment standards.

The Agency has recently collected six scrubber water residual samples generated from incineration of K048 waste and is currently analyzing these samples to determine the level of performance achieved. Depending on the results of these analyses, the Agency may adjust the wastewater standards for BDAT organics and metals before the promulgation of this rule.

4. *Identification of BDAT.* EPA has determined that for BDAT organics in the K048-K052 wastes, fluidized bed incineration achieves a level of performance that represents treatment by BDAT. While BDAT is not identified as rotary kiln incineration, EPA believes that a well-designed and well-operated rotary kiln incinerator will achieve the applicable treatment standards for K048-K052. Accordingly, EPA will use rotary kiln incineration in its estimates of available treatment capacity.

For metals in the incinerator ash, EPA has determined that stabilization using a lime/flyash binder achieves a level of performance that represents BDAT. Other binders tested were cement and kiln dust; EPA determined that use of both of these binders resulted in less effective treatment than the use of the lime/flyash binder. (EPA's analysis of these data can be found in BDAT background document for K048-K052.)

For BDAT list metals in the wastewater, EPA has identified chromium reduction followed by chemical precipitation and vacuum filtration as BDAT for metals.

Incineration followed by metal stabilization for the nonwastewater K048-K052 and chromium reduction followed by chemical precipitation and filtration for the wastewater K048-K052 are judged to be available to treat K048-K052 because (1) these technologies are commercially available, and (2) these technologies provide substantial reduction of both organic and metal hazardous constituents. For a detailed description of the reductions exhibited by treatment of these wastes, refer to the *BDAT Background Document for First Third Wastes—K048-K052*.

5. *Regulated Constituents and Treatment Standards.* Below are listed the regulated constituents for K048-K052

and the associated treatment standards. For organic constituents, the standards are expressed as total constituent concentration, and for the metals, the standards reflect concentrations in the leachate developed by using the TCLP.

BDAT TREATMENT STANDARDS FOR K048

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total Composition (mg/kg)	TCLP (mg/l)
Bis(2-ethylhexyl)phthalate...	4.18	(¹)
Toluene.....	3.93	(¹)
Chrysene.....	0.84	(¹)
Xylene.....	8.54	(¹)
Di-n-butyl phthalate.....	4.18	(¹)
Naphthalene.....	0.84	(¹)
Phenanthrene.....	0.84	(¹)
Phenol.....	0.84	(¹)
Cyanide.....	1.48	(¹)
Total chromium.....	(¹)	1.68
Arsenic.....	(¹)	0.006
Copper.....	(¹)	0.013
Nickel.....	(¹)	0.048
Selenium.....	(¹)	0.025
Vanadium.....	(¹)	0.18
Zinc.....	(¹)	0.141

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K048

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total Composition (mg/kg)	TCLP (mg/l)
Phenol.....	0.007	(¹)
Fluorene.....	0.007	(¹)
Toluene.....	0.007	(¹)
Xylene.....	0.007	(¹)
Naphthalene.....	0.007	(¹)
Phenanthrene.....	0.007	(¹)
Total chromium.....	0.20	(¹)
Lead.....	0.037	(¹)
Zinc.....	0.40	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K049

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total Composition (mg/kg)	TCLP (mg/l)
Benzene.....	3.93	(¹)
Chrysene.....	0.84	(¹)
Xylene.....	8.54	(¹)
Toluene.....	3.93	(¹)
Naphthalene.....	0.84	(¹)
Phenanthrene.....	0.84	(¹)
Phenol.....	0.84	(¹)
Pyrene.....	1.06	(¹)
Cyanide.....	1.48	(¹)
Total chromium.....	(¹)	1.68
Arsenic.....	(¹)	0.006

BDAT TREATMENT STANDARDS FOR K049—Continued

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total Composition (mg/kg)	TCLP (mg/l)
Copper.....	(¹)	0.013
Nickel.....	(¹)	0.048
Selenium.....	(¹)	0.025
Vanadium.....	(¹)	0.18
Zinc.....	(¹)	0.141

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K049

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total Composition (mg/kg)	TCLP (mg/l)
Anthracene.....	0.007	(¹)
Xylene.....	0.007	(¹)
2,4-Dimethylphenol.....	0.007	(¹)
Benzene.....	0.023	(¹)
Toluene.....	0.007	(¹)
Naphthalene.....	0.007	(¹)
Phenanthrene.....	0.007	(¹)
Phenol.....	0.007	(¹)
Total chromium.....	0.20	(¹)
Lead.....	0.037	(¹)
Zinc.....	0.40	(¹)

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K050

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Benzo(a)pyrene.....	0.84	(¹)
Phenol.....	0.84	(¹)
Cyanide.....	1.48	(¹)
Total chromium.....	(¹)	1.68
Arsenic.....	(¹)	0.006
Copper.....	(¹)	0.013
Nickel.....	(¹)	0.048
Selenium.....	(¹)	0.025
Vanadium.....	(¹)	0.18
Zinc.....	(¹)	0.141

(¹) Not applicable.

BDAT TREATMENT STANDARDS FOR K050

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Phenol.....	0.007	(¹)
Total chromium.....	0.20	(¹)
Lead.....	0.037	(¹)

BDAT TREATMENT STANDARDS FOR
K050—Continued

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Zinc.....	0.40	

(1) Not applicable.

BDAT TREATMENT STANDARDS FOR K050

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Toluene.....	3.93	(1)
Chrysene.....	0.84	(1)
Xylene.....	8.54	(1)
Di-n-butyl phthalate.....	4.18	(1)
Naphthalene.....	0.84	(1)
Phenanthrene.....	0.84	(1)
Phenol.....	0.84	(1)
Pyrene.....	1.06	(1)
Cyanide.....	1.48	(1)
Total chromium.....	(1)	1.68
Arsenic.....	(1)	0.006
Copper.....	(1)	0.013
Nickel.....	(1)	0.048
Selenium.....	(1)	0.025
Vanadium.....	(1)	0.18
Zinc.....	(1)	0.141

(1) Not applicable.

BDAT TREATMENT STANDARDS FOR K050

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Fluorene.....	0.007	(1)
Acenaphthene.....	0.007	(1)
Toluene.....	0.007	(1)
Xylene.....	0.007	(1)
Naphthalene.....	0.007	(1)
Phenanthrene.....	0.007	(1)
Phenol.....	0.007	(1)
Total chromium.....	0.20	(1)
Lead.....	0.037	(1)
Zinc.....	0.40	(1)

(1) Not applicable.

BDAT TREATMENT STANDARDS FOR K052

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Toluene.....	3.93	(1)
Xylene.....	8.54	(1)
o-Cresol.....	0.84	(1)

BDAT TREATMENT STANDARDS FOR
K052—Continued

[Nonwastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
p-Cresol.....	0.84	(1)
Naphthalene.....	0.84	(1)
Phenanthrene.....	0.84	(1)
Phenol.....	0.84	(1)
Cyanide.....	1.48	(1)
Total chromium.....	(1)	1.68
Arsenic.....	(1)	0.006
Copper.....	(1)	0.013
Nickel.....	(1)	0.048
Selenium.....	(1)	0.025
Vanadium.....	(1)	0.18
Zinc.....	(1)	0.141

(1) Not applicable.

BDAT TREATMENT STANDARDS FOR K052

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Phenanthrene.....	0.007	(1)
2,4-Dimethylphenol.....	0.007	(1)
Benzene.....	0.023	(1)
Xylene.....	0.007	(1)
o-Cresol.....	0.007	(1)
p-Cresol.....	0.007	(1)
Naphthalene.....	0.007	(1)
Phenol.....	0.007	(1)
Total chromium.....	0.20	(1)
Lead.....	0.037	(1)
Zinc.....	0.40	(1)

(1) Not applicable.

h. K069—Emission Control Dust/Sludge from Secondary Lead Smelting

1. Industries Affected and Waste Description. The listed waste K069 is generated in the secondary lead smelting process. The Agency estimates that 69 facilities are secondary lead smelters. Most of these facilities are located in the South Central and Midwest parts of the United States. Secondary lead smelting generates particulate emissions which contain hazardous constituents present in feed materials. Metals are entrained in furnace fumes and are collected by air pollution control devices. The emission control dust generated is the listed waste K069.

2. Demonstrated Treatment Technologies. K069 waste principally consists of lead, cadmium, and chromium. The Agency is aware of three technologies applicable to the treatment of K069 waste: Total recycling, high temperature metals recovery, and stabilization. Because the waste

contains recoverable quantities of lead, it can be totally recycled as a feedstock for resmelting. High temperature metals recovery can be applied to recover metal constituents from the waste. Stabilization treatment reduces the leachability of the metals in the waste slag that results from resmelting.

EPA verified the use of recycling through information requests under RCRA section 3007. EPA did not test other applicable technologies because they generated residuals that still contain some level of contamination.

3. Data Base. The Agency has data from 7 facilities stating that total recycling of K069 is practiced and that K069 is not land disposed. Of nine RCRA section 3007 letters sent to generators at 13 plants, seven responded confirming the fact that total recycling is used. Of the two others, one exports the waste to be recycled and the other company did not respond. A letter was also received from the Secondary Lead Smelters Association which stated that total recycling of the baghouse dust is practiced throughout the industry and that land disposal of K069 does not occur.

4. Identification of BDAT. BDAT for K069 is total recycling. Total recycling is demonstrated at more than 10 facilities and confirmed by the Secondary Lead Smelters Association as the waste management technique practiced throughout the industry.

Total recycling is judged to be available to treat K069 waste because (1) the Agency does not have information showing that recycling poses a greater total risk to human health and the environment than land disposal; (2) it is commercially available; and (3) this treatment technology provided a substantial reduction of hazardous constituents because it eliminates the need for land disposal of K069.

Designating a form of recycling technology as the basis for BDAT raises issues analogous to those involving K061 waste. EPA will summarize its conclusions here, subject to public comment:

- EPA may prohibit land disposal of K069 waste, whether or not it would be a solid waste when recycled;

- Even under the *American Mining Congress* opinion, the K069 being reclaimed could be viewed as a solid waste, because it derives from treatment of discarded materials (scrap lead, discarded batteries and the like) (see, e.g., 824 F. 2d at 1188);

- Under the Agency's May 6, 1987 proposal, K069 waste, however, would be considered to be indigenous to the

secondary lead smelting process and therefore would cease being a waste at the moment it is reintroduced to the smelting furnace; and therefore,

- Any slag resulting from high temperature metals recovery of this waste (in a secondary lead smelter) would not automatically be a hazardous waste (i.e., the "derived from" rule would not apply), and would be hazardous only if it exhibits a characteristic of hazardous waste (assuming the Agency does not alter its proposal with regard to indigenous wastes). The Agency consequently is not proposing a treatment standard for the slag at this time, nor would a prohibition necessarily apply (assuming the slag is hazardous) until the "Final Third" prohibition date of May 8, 1990.

The proposed treatment standard for K069 is "No Land Disposal" (see discussion of the significance of this treatment standard in Section A. 9. above). Rather than simply prohibiting the waste from land disposal, setting this "treatment standard" achieves the Agency's intent to prohibit the land disposal of these wastes, while at the same time allows for the possibility of a variance from the treatment standard. Should a waste be generated that is unable to be totally recycled (e.g., such as a waste generated at a CERCLA site) such a waste may be eligible for a variance from the treatment standard. A waste is not eligible for a variance from the treatment standard if no treatment standard has been established. An interested party would have to petition the Agency for a treatment standard, a more cumbersome and time-consuming process.

i. K015—Still Bottoms From the Distillation of Benzyl Chloride

1. Industries Affected and Waste Description. The Agency estimates that three facilities produce the listed waste K015. These facilities are located in New Jersey and Tennessee.

Benzyl chloride is produced by the chlorination of toluene in a reactor (or series of reactors). Unreacted toluene is recycled back to the reactor, while the reaction products containing crude benzyl chloride are distilled. The still bottoms are the listed waste K015.

2. Demonstrated Treatment Technologies. K015 waste generally contains greater than 88 percent benzal chloride, less than 12 percent benzotrichloride and other chlorinated benzenes, less than 5 percent benzyl chloride, less than 1 percent toluene, less than 1 percent other BDAT constituents, and less than 1 percent water. The demonstrated technologies that the Agency has identified for

treatment of K015 waste are liquid injection incineration, fuel substitution, and recovery.

The Agency tested liquid injection incineration of K015. EPA did not locate any facilities using fuel substitution, and data on recovery were not available.

3. Data Base. Wastewaters Generated From Incineration. For K015 waste, the Agency has data from one facility. EPA has three scrubber water data points which represent destruction of BDAT organic compounds by liquid injection incineration. The data reflect total constituent analyses; all data were used in the development of treatment standards because EPA collected data showing that the incinerator was properly operated during the treatment tests.

4. Identification of BDAT. BDAT for K015 waste is identified as liquid injection incineration. This technology is the only technology for which the Agency has treatment data, as noted above. Although only liquid injection incineration was tested, EPA believes that well designed and operated fuel substitution systems can achieve the treatment standards. Accordingly, EPA is considering these technologies in its capacity determinations.

Liquid injection incineration is demonstrated at approximately 250 facilities. The Agency is not aware of any generator or TSD facility currently using liquid injection incineration for treatment of K015; however, EPA believes liquid injection incineration is demonstrated for K015 in that the technology is being used to treat wastes similar to K015 with regard to parameters affecting treatment selection including: BTU content, filterable solids, total organic carbon, viscosity, and water content. EPA has confirmed its judgment by demonstrating achievable performance in a test burn. The Agency also believes this technology is available because (1) incineration technologies are commercially available or can be purchased from a proprietor, and (2) incineration provides substantial reduction of the concentration of organic hazardous constituents. For a detailed description of the reductions exhibited by treatment of these wastes, refer to the *BDAT Background Document for First Third Wastes—K015*.

5. Regulated Constituents and Treatment Standards. EPA is proposing "No Land Disposal" as the treatment standard for K015 nonwastewaters because the Agency is unaware of any nonwastewater residuals from the treatment of K015. (EPA solicits comment to the contrary.) Should such a waste be generated in the future, such

waste may be eligible for a variance from this treatment standard.

Below are listed the regulated constituents for K015 and the treatment standards for wastewater.

BDAT TREATMENT STANDARDS FOR K015

[Wastewater]

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Anthracene.....	1.02	(¹)
Benzal chloride.....	0.28	
Benzo (b and/or k) fluoranthene.....	0.29	
Phenanthrene.....	0.27	
Toluene.....	1.00	
Total chromium.....	0.30	
Nickel.....	0.44	

¹ Not applicable.

j. K037—Wastewater Treatment Sludges from the Production of Disulfoton

1. Industry Affected and Waste Description. The listed waste K037 is defined as wastewater treatment sludge from the production of disulfoton. The Agency estimates that one facility produces disulfoton and produces K037 waste.

2. Demonstrated Treatment Technologies. The K037 waste generally contains less than 5 percent water, 20 percent disulfoton, 75 percent solids and 0.2 percent toluene. The waste contains high levels of filterable solids. The Agency has identified and tested rotary kiln incineration for treatment of this waste. Rotary kiln incineration is a destruction technology applicable to organic bearing wastes with solids concentrations that prevent the use of liquid injection incineration.

3. Data Base. i. Non wastewaters. For K037, the Agency has six untreated and treated data points from one plant. These data sets include both total constituent concentration and TCLP leachate values. All data sets were used in development of treatment standards because data show that the unit was properly operated during the time the waste was treated.

ii. Wastewaters Generated from Incineration. The Agency has six scrubber water data points which represent destruction of BDAT compounds in the afterburner of the rotary kiln incinerator. The data reflect total constituent analyses; all data were used in the development of treatment standards because data show that the afterburner was properly operated during the treatment test.

4. *Identification of BDAT.* BDAT for waste K037 was determined to be rotary kiln incineration. This technology was the only technology for which the Agency has treatment data, as noted in the previous subsection (Data Base).

EPA is not aware of any generator or TSDFs currently using rotary kiln incineration for treatment of K037. However, EPA believes rotary kiln incineration is demonstrated to treat K037 in that it is being used to treat wastes similar to K037 with regard to parameters affecting treatment selection, including low water content and high solids concentration. EPA has confirmed this judgement by demonstrating the actual performance achievability when K037 was incinerated in EPA's in-house rotary kiln incinerator.

Rotary kiln incineration is judged to be available to treat K037 because (1) this technology is commercially available or can be purchased from a proprietor, and (2) incineration provides substantial reduction of the concentration of organic hazardous constituents. For a detailed discussion of the reductions exhibited by treatment of this waste, refer to the *BDAT Background Document for First Third Wastes—K037*.

5. *Regulated Constituents and Treatment Standards.* The regulated constituents for K037 and the treatment standards for wastewaters and nonwastewaters are listed below.

BDAT TREATMENT STANDARDS FOR K037 (NONWASTEWATER)

Constituent	Maximum for any single grab sample	
	Total composition (mg/kg)	TCLP (mg/l)
Disulfoton.....	0.1	(¹)
Toluene.....	28.0	

¹ Not applicable.

BDAT TREATMENT STANDARDS FOR K037 (WASTEWATER)

Constituent	Maximum for any single grab sample	
	Total composition (mg/l)	TCLP (mg/l)
Disulfoton.....	0.003	(¹)
Toluene.....	0.028	

¹ Not applicable.

k. K004—Wastewater Treatment Sludge from the Production of Zinc Yellow Pigments

K008—Oven Residue from the Production of Chrome Oxide Green Pigments

K036—Still Bottoms from Toluene Reclamation Distillation in the Production of Disulfoton

K073—Chlorinated Hydrocarbon Waste from the Purification Step of the Diaphragm Cell Process Using Graphite Anodes in Chlorine Production

K100—Waste Leaching Solution from Acid Leaching of Emission Control Dust/Sludge from Secondary Lead Smelting

Based on available information, the Agency believes that these wastes are no longer generated, and therefore, not currently land disposed. (EPA solicits comment to the contrary.) The Agency is prohibiting land disposal of these wastes. This approach ensures that these wastes will not be land disposed in the future.

The proposed treatment standard for these wastes is "No Land Disposal", allowing for the possibility that these wastes may be generated at a CERCLA site and may require a variance from the treatment standard. For a more detailed discussion on the significance of this treatment standard, see Section III. A. 9.

It should also be noted that the May 28, 1986 schedule for restricting the listed hazardous wastes from land disposal (51 FR 19300) lists K100 in the final third. Therefore, K100 was not originally scheduled for regulation under 40 CFR Part 268 until May 8, 1990. However, because EPA has determined that this waste is no longer generated, the Agency has decided to accelerate the schedule for this waste and proposes to set the "No Land Disposal" treatment standard for this waste by August 8, 1988.

B. Testing and Recordkeeping

1. Waste Analysis

The treatment standards proposed in today's notice are expressed as either (1) concentration levels in an extract developed by use of the Toxicity Characteristic Leaching Procedure (TCLP); (2) a total composition waste analysis; or (3) both. How these treatment standards are measured depends upon the technology (or combination of technologies) identified as BDAT for the specific waste.

Basically, for destruction (for organics) or removal (for metals) technologies, the Agency believes that a total composition analysis is designed to provide an accurate measure of the performance of the technology identified as BDAT. Congress in fact expected that treatment would destroy organic

constituents in hazardous wastes [Vol. 130, Cong. Rec. S 9179 (daily ed. July 25, 1984)], and the logical way to measure destruction is to analyze total concentration of waste constituents. Conversely, where stabilization or fixation technologies (i.e., technologies which decrease waste constituent mobility) are identified as BDAT, the TCLP is a better measure of performance because it is designed to measure the mobility of hazardous constituents from a waste matrix.

In cases where the combination of both destruction or removal technologies, and stabilization or fixation technologies is identified as BDAT, both analyses must be employed to monitor compliance with the treatment standards. In such cases, neither test alone is designed to ensure that the treatment standard has been met. For example, where a waste contains organic constituents amenable to destruction and metals amenable to fixation, the total composition analysis may demonstrate that the organics have been treated to the applicable concentration level; however, reduction in the mobility of metals must also be ensured. Likewise, use of the TCLP may demonstrate that the metals have been treated to the applicable concentration levels in the extract, yet does not indicate whether the organics have been destroyed in compliance with the applicable treatment standard. Both tests must be used to ensure that the "dual" treatment standard has been met.

The Agency considered the use of only the TCLP where BDAT includes a stabilization or fixation technology. It appears more logical to the Agency that because the TCLP is not designed to evaluate destruction, total waste analysis be used if part of the BDAT treatment train includes destruction (or removal) technologies. However, EPA is soliciting comment on this approach.

2. Notification Requirements

Today's proposal extends the existing notification requirements in § 268.7—which create tracking, certification, and recordkeeping requirements for managers of restricted wastes—to apply to First Third wastes, whether or not treatment standards have been established. For First Third wastes where EPA has established a treatment standard or effective date, the requirements are the same as for other restricted wastes and, therefore, no additional language is needed. Because the statutory waste management requirements applicable to "soft hammer" wastes are somewhat different than existing requirements for other

restricted wastes (namely, a RCRA section 3004(g)(6) certification to EPA is not required for these wastes when land disposed in units other than landfills or surface impoundments), the Agency is proposing new requirements in § 268.7 to account for these differences.

The basic difference between the notification applicable to the "soft hammer" wastes and the notification applicable to other restricted wastes is that rather than requiring notice of the applicable treatment standard or applicable prohibition (see existing § 268.7(a)(1) [the generator notifies the treatment facility of the applicable prohibitions and treatment standards for restricted wastes sent to the treatment facility]), the notice for "soft hammer" wastes would require the generator to notify the receiving facility of the "soft hammer" prohibitions codified in § 268.33 (i.e., that such wastes are prohibited from land disposal in landfill and surface impoundment units unless accompanied by a valid certification (and demonstration, if applicable) in accordance with the requirements of § 268.8, relating to the practical unavailability of treatment technologies). The EPA Hazardous Waste Number, the manifest number associated with the waste shipment, and any available waste analysis data must also be included in this "soft hammer" notice.

The Agency believes such notification is necessary because of the importance of having a consistent tracking and identification mechanism for all restricted wastes. The notification thus informs treatment facilities (and other handlers) of the obligation to treat "soft hammer" wastes destined for disposal in landfill or surface impoundment units (to the extent treatment is practically available). Notification also informs managers of these wastes that the storage prohibition in § 268.50 is applicable to the waste.

3. Recordkeeping Requirements for Storage Facilities

The Agency is also proposing today to correct an unintended oversight in the recordkeeping regulations of § 268.7 to indicate that the section applies to facilities that store prohibited wastes. As currently drafted, the provision applies to generators, treatment facilities, and land disposal facilities but omits another possible actor in the chain, the facility that simply stores prohibited wastes without treating them. There is no reason for such facilities not to be covered by the provision, which is intended to track prohibited wastes from cradle to grave, and to ensure that all facilities receiving such wastes be on

notice that the waste is prohibited and what the applicable treatment standard (or applicable prohibition) for the waste is. These purposes are thwarted if storage facilities are not covered by the provision. Consequently, the Agency is proposing today to remedy this deficiency by including storage facilities under the recordkeeping requirements of § 268.7. This requirement would apply to all prohibited wastes, not only to those affected by today's proposal.

In addition to the "generator-to-storage" scenario discussed above, this notice also proposes to apply the notification requirement to a treatment, storage or disposal facility that sends a restricted waste (or treatment residue) off-site to another treatment or storage facility. The Agency believes this change will adequately track all restricted waste from cradle to grave.

Another change to the current regulatory language to facilitate the "cradle-to-grave" tracking system is an amendment of section 268.7(a)(3). This provision of the regulation concerns the case where a generator determines that his restricted waste is eligible for land disposal because it is subject to an extension of the effective date or a "no migration" exemption (i.e., the waste may be land disposed, but not because the waste meets the applicable treatment standards). In this case, the generator would be required to notify the disposal facility of the status of his waste. Here again, the Agency overlooked the possibility that the waste may not be sent directly to the land disposal facility, and may in fact be going to treatment or storage. Therefore, to avoid any confusion, EPA proposes to amend § 268.7(a)(3) to require that the notice be sent with each shipment of waste to the receiving facility.

C. "Soft Hammer" Provisions

1. Applicability

RCRA section 3004(g)(6) (42 U.S.C. 6924(g)(6)) provides that if EPA fails to set treatment standards for any hazardous waste included in the schedule promulgated on May 28, 1986 (51 FR 19300) by the statutory deadline, such waste may be land disposed in a landfill or surface impoundment only if:

- (i) such facility is in compliance with the requirements of subsection (o) which are applicable to new facilities (relating to minimum technological requirements); and
- (ii) prior to such disposal, the generator has certified to the Administrator that such generator has investigated the availability of treatment capacity and has determined that the use of such landfill or surface impoundment is the only practical alternative to treatment currently available to the generator. (RCRA section 3004(g)(6)(A))

This so-called "soft hammer" applies until May 8, 1990, at which time such wastes will automatically be prohibited from all methods of land disposal that are not otherwise determined to be protective through the "no migration" petition process (§ 268.6).

As a preliminary matter, it is important to note that these "soft hammer" provisions, including the demonstrations, certifications, notifications, and treatment requirements are only applicable to First Third wastes for which treatment standards have not been established, and are only applicable until May 8, 1990. During the period of the "soft hammer" provision, those wastes which are currently subject to the California list restrictions would remain so, and thus might be prohibited from land disposal even though they are also a "soft hammer" waste. This result is consistent with statements in previous preambles. The Agency indicated that waste-specific prohibitions, treatment standards, and effective dates would supersede California list prohibitions, treatment standards, and effective dates (52 FR 25773, 25776, and § 268.32(h), July 8, 1987). This is because where the Agency has made a waste-specific determination, it is likely to be a more accurate and a more considered regulatory judgment than for the generically designated California list wastes. The Agency has made no such considered judgment with respect to "soft hammer" wastes, however. In the absence of any such specific regulatory determination, it makes sense that these wastes be treated at least to the extent necessary to comply with the California list prohibitions and treatment standards (where applicable). California list capacity determinations likewise would supersede the "soft hammer" provisions, since these capacity determinations are tied directly to the specific treatment standards, and represent a specific Agency determination.

2. Interpretation of Specific Terms

Because EPA does not expect to establish treatment standards for all of the First Third wastes, the Agency is proposing the regulatory framework for management of these "soft hammer" wastes until May 8, 1990, or until treatment standards are promulgated, whichever is sooner. To facilitate the implementation of these provisions, the Agency is discussing its interpretation of the terms "treatment" and "facility" as stated in section 3004(g)(6), and requesting comment on these interpretations.

a. *"Treatment"* For the purposes of the "soft hammer" provision, the Agency is interpreting "treatment" to mean processing which reduces a waste's toxicity or which reduces the likelihood of migration of hazardous constituents from the waste. By not quantifying the term, the Agency thus would require that "soft hammer" wastes be treated by any current treatment methods which are practically available and which achieve meaningful (i.e., environmentally beneficial) reductions of waste constituent toxicity and/or mobility. Treatment would continue so long as further meaningful reductions in toxicity and/or mobility can be achieved (again assuming that treatment alternatives are practically available). Where the "best" treatment is not currently available, the "next best" treatment will be required. Thus, even if a waste has been treated, the requirement to treat to reduce the toxicity of the waste or the likelihood of migration of hazardous constituents from the waste would still apply. Further treatment that achieves meaningful reductions, is practically available, would have to be employed.

Congress clearly wished to require treatment prior to disposal of section 3004(g) wastes in impoundments and landfills—two forms of surface disposal singled out for special mandated minimum technological requirements. By taking a relatively stringent view of what constitutes treatment, the Agency is furthering this congressional purpose. In addition, the Agency believes that Congress intended that, during the period of the "soft hammer", only wastes treated to the most protective levels achievable by practically available technologies may go to land disposal in landfills or surface impoundments. Therefore, the Agency believes that defining "treatment" for the purposes of the "soft hammer" provision as a reduction of toxicity or likelihood of migration of hazardous constituents is consistent with the intent of Congress.

The Agency realizes that this approach could be interpreted to imply that residuals from treatment would have to be continually treated by the same process, or past the point where meaningful reductions can occur. This is not the Agency's intention (i.e., the Agency does not intend to require solely for the sake of treatment). EPA solicits suggestions as to the best means of expressing the intention that treatment achieve some meaningful degree of environmental benefit to avoid requiring sequential treatment that achieves only minimal reductions. EPA could limit

such treatment by requiring that a single process be used only once. Another approach to limiting treatment is to set a performance limit by which treatment would be defined. For example, treatment could be defined by limiting the scope of available technologies to those technologies that yield a reduction of 20% in concentration or mobility of toxic constituents (or another designated percentage of reduction). Those technologies that do not yield at least a 20% reduction in toxicity of the waste or likelihood of migration of hazardous constituents from the waste would not be considered to be practically available "treatment" for this purpose. (Were the Agency to adopt this approach, such a standard would not imply that EPA would be setting a surrogate treatment standard of 20% reduction. The level of treatment would not be a 20% reduction, but rather the performance level achievable by the treatment technology used.)

The Agency's chief objective in interpreting the statutory reference to treatment is to prohibit certifications for "soft hammer" wastes that have only been treated minimally when meaningful reductions can be achieved by a practically available treatment technology. The Agency therefore solicits comment on an approach that would address this problem directly by requiring that "soft hammer" wastes be treated so as to achieve meaningful reductions of wastes' toxicity or mobility (the statutory section 3004(m)(1) standard) and by stating that sham or *de minimus* treatment cannot give rise to a valid certification (assuming legitimate treatment is practically available at the time of certification). An example of sham treatment would be adding dirt to a waste to reduce its mobility.

This approach would differ from the one proposed by not necessarily requiring sequential treatment to reduce further increments of wastes' toxicity or mobility. It could have a practical advantage of removing one complicated feature from the rule, since the regulated community and EPA officials would no longer need to struggle to determine how much treatment is needed. It would also focus regulatory efforts on the problem of sham treatment, rather than diffusing such efforts over issues of further incremental reductions.

The Agency solicits comment on these alternatives, and, in general, on its interpretation of "treatment", as it applies to the "soft hammer" provision in § 268.8.

b. *"Facility"*. Section 3004(g)(6) states that "soft hammer" wastes may be

disposed in surface impoundments and landfills "only if such facility is in compliance with the requirements of section (o) which are applicable to new facilities." EPA is interpreting "facility" in section 3004(g)(6) to refer to the individual landfill or surface impoundment "unit". EPA is persuaded that this is the best reading of the provision based on the language of the statute, and on evident congressional policy reflected in the statutory language and in the legislative history.

First, the reference in the provision to facilities appears to be linked directly to landfills and surface impoundments. Thus, the statutory reference to "*such facility*" (emphasis added) refers to the landfill or surface impoundment units mentioned immediately previously.

Second, and even more importantly, the statute requires that "such facility" be in compliance with the minimum technological requirements "which are applicable to new facilities." New landfills and surface impoundments, or new landfill and surface impoundment units at existing facilities, however, must have double liners, leachate collection systems, and groundwater monitoring. Congress thus appears to be saying that if landfills and surface impoundments are to receive "soft hammer" wastes, then they must meet the minimum technological requirements that would apply if they were new.

This reading seems to the Agency to be most in accord with the intent of the provision. If the Agency fails to establish a treatment standard for a section 3004(g) waste, and these wastes are destined for disposal in units about which Congress had particular concerns, then, at the least, these units should meet the minimum technological requirements. The alternative is to sanction disposal of untreated wastes (assuming there is no practically available treatment technology) in landfills and impoundments not meeting minimum technological requirements, a result EPA does not believe Congress intended. In this regard, the legislative history indicates that Congress intended that landfills and impoundments receiving prohibited wastes for which the Agency failed to establish treatment standards meet the minimum technological requirements:

Only after a generator certifies to EPA that such generator has investigated the availability of treatment capacity and determined that the use of a landfill or surface impoundment is the only practical alternative to treatment currently available may such waste be placed in a landfill or surface impoundment. *A further limitation is the condition that such landfill or surface*

impoundment must satisfy the minimum technological requirements for new facilities.

[S. Rep. No. 284, 98th Cong., 1st Sess. 21 (1983), (emphasis added)] (explaining language later adopted in section 3004(g)(6))

It also bears mention that the language in section 3004(o) does not refer to new *facilities*, but rather, it addresses new, replacement, or lateral expansion landfill or surface impoundment *units* at an existing facility. This language likewise suggests that Congress meant section 3004(g)(6) to apply to units rather than facilities; otherwise, section 3004(g)(6) would have no meaning at all.

An alternative interpretation of the statutory language is that the reference to " * * * requirements * * * applicable to new facilities * * *" would apply to the entire facility. This would give the term "facility" its literal meaning, but does not appear to reflect congressional intent. Under this interpretation, each unit as a facility would have to be in compliance with the minimum technological requirements of section 3004(o) since those are the requirements that would be applicable to a new, or "green-field", facility. EPA does not consider this to be a viable option because there are very few, if any, such facilities. Thus, this interpretation of the "soft hammer" provision could result in a "hard hammer", which the Agency does not believe was the intent of Congress in providing for section 3004(g)(6). If Congress had intended to prohibit land disposal of these wastes in landfills or impoundments, it could have said so directly as it did in section 3004(g)(6)(C).

A third option would be to interpret section 3004(g)(6) the same way as the Agency previously interpreted section 3004(b)(4) (see existing § 268.5(h)) (i.e., the facility as a whole must be in compliance with the requirements of section 3004(o), meaning that all new, replacement, or lateral expansion landfill or surface impoundment units must meet the minimum technological requirements, but that the waste could go into any unit at such a facility, e.g., existing units not meeting the minimum technological requirements). While this would be consistent with the Agency's current interpretation of "facility" in section 3004(h)(4)—which concerns the disposal of wastes subject to an extension of the effective date—it would ignore the additional language in section 3004(g)(6) (i.e., " * * * requirements * * * which are applicable to new facilities * * *", rather than "requirements of subsection (o)"). In addition, this would allow untreated "soft hammer" wastes with a valid

certification to be disposed in the same types of units as those First Third wastes which meet the applicable treatment standards. EPA does not believe that this is what Congress intended; however, the Agency is requesting comment on this interpretation. Also, as discussed in greater detail in Section III. D., the Agency has reconsidered its interpretation of section 3004(h)(4) and is proposing to require wastes which are subject to an extension to the effective date to be disposed in landfills and surface impoundments only if such *units* are in compliance with the minimum technological requirements of section 3004(o).

c. Certification by Owners or Operators as Well as Generators. The statute provides that generators of "soft hammer" wastes certify to the Agency that disposal in a landfill or impoundment is the only practical alternative to treatment currently available. This language raises two potential problems: (1) Are generators the only entity that can certify; and (2) can a certification be filed for land disposal of *treated* "soft hammer" wastes.

With respect to the first problem, the Agency sees no reason to restrict certification to generators. There are situations where owners and operators of a treatment or storage facility may be more knowledgeable as to what treatment is available, or may otherwise be more sophisticated in the nuances of administrative recordkeeping than a generator. The Agency does not believe that the underlying policy of the "soft hammer" provision would be subverted by allowing these entities the option of submitting a certification.

With respect to the second problem, although the statute does not address the issue of certification for treatment residuals, the Agency is of the view that the certification provisions would apply. This reading is necessary to avoid the anomalous result of "soft hammer" waste treatment residues being prohibited from land disposal but untreated wastes being land disposed in impoundments and landfills after filing a certification. Congress could not have intended this result. Consequently, the Agency is proposing that the "soft hammer" certification apply to both untreated wastes and treatment residuals. A certification for a treatment residue would also state that there is no treatment practically available to achieve meaningful reductions in toxicity or mobility at the time of certification.

3. Certification Requirements

EPA believes the intent of Congress was to ensure that wastes for which treatment standards or extensions to the effective date were not established would nevertheless be treated to reduce the toxicity or mobility of the hazardous constituents by practically available treatment technologies prior to disposal in landfill or surface impoundment units that meet the minimum technological requirements. As stated earlier, EPA interprets this to mean that where the "best" demonstrated treatment is not currently available, the "next best" demonstrated treatment is required, so long as meaningful reductions can be achieved. The Agency also interprets this to mean that this requirement is not necessarily fulfilled by a single treatment step. Because a waste has been treated does not mean that further meaningful reduction of toxicity or mobility is not available. Before a treated "soft hammer" waste may be disposed in a landfill or surface impoundment, the generator or owner or operator thus must still certify that there is no practically available treatment that meaningfully reduces the toxicity or mobility of the hazardous constituents.

The Agency is also proposing to require generators or owners or operators to certify that they have utilized the practically available "treatment" (or train of treatment) that *most* reduces the toxicity or mobility of the hazardous constituents. Therefore, where more than one treatment technology is available, the treatment which provides the most meaningful reduction in toxicity or mobility is required. This interpretation precludes some forms of treatment where "better" treatment is available. For example, a waste may be amenable to meaningful treatment by two available technologies, incineration and stabilization, where incineration yields the greater reduction in toxicity or mobility. If incinerated, the residuals may still require further treatment by stabilization before they are eligible for disposal in a landfill or surface impoundment unit. However, if the waste is first stabilized, incineration may no longer be available for the residual. Such stabilization as the initial treatment would not provide the most meaningful reduction in toxicity or mobility, and the Agency thus would not accept a certification to this effect, assuming incineration remains practically available. EPA is soliciting comments on this interpretation.

The Agency thus is proposing in § 268.8 that the following requirements be met before a "soft hammer" waste is

eligible for land disposal in a landfill or surface impoundment unit:

(1) The generator has made a good faith effort to locate and contract with treatment or recovery facilities which can meaningfully reduce the toxicity or mobility of hazardous constituents in the waste.

(2) If the waste has been treated, the generator or owner or operator demonstrates that no treatment is practically available to provide further meaningful reductions in the toxicity or mobility of hazardous constituents in the residual at the time of certification.

(3) The generator or owner or operator certifies that the above conditions have been met and sends the Regional Administrator the certification and supporting documentation, and keeps the same documentation on-site.

(4) Following certification to the Regional Administrator, the generator or owner or operator must send a copy of the certification and supporting documentation to the disposal facility with the initial waste shipment, and continue to send the certification itself with each shipment of waste thereafter.

(5) The owner or operator of the disposal facility must

(a) keep all information and documentation received with the waste in the operating record, and

(b) ensure that such waste is only placed in a landfill or surface impoundment unit that meets the minimum technological requirements of RCRA section 3004(o) (i.e., double liner, leachate collection system, and ground-water monitoring or compliance with a statutory variance from these requirements).

4. Treatment of "Soft Hammer" Wastes in Surface Impoundments.

Under § 268.4 (which implements RCRA section 3005(j)(11)), restricted wastes may be treated in surface impoundments that meet the section 3004(o) minimum technological requirements provided that, among other things, residuals not meeting the applicable treatment standards (or statutory prohibition levels where treatment standards are not established) are removed within one year of placement in the impoundment. Because no treatment standards have been set for "soft hammer" wastes, removal of these residuals would seemingly be required.

There is an anomaly with this result, however. Were the owner or operator to consider the unit to be a disposal impoundment he could certify that no practical alternative to disposal exists and dispose of them in the same impoundment. Or, he could remove the residues, and, making the same certification, put them back. Provided that no further treatment is practically available, these residuals would be eligible for disposal in the same surface impoundment unit from which they were removed (since the minimum

technological requirements for disposal of "soft hammer" wastes in a surface impoundment and for treatment of restricted wastes in a surface impoundment are identical).

The Agency believes that requiring such removal of treatment residuals of "soft hammer" wastes (which may then be eligible for disposal in the same type of unit, or indeed, the very same unit) would simply impose costs with no environmental benefit. In such cases, therefore, the Agency is proposing that the certification required for disposal may be made without removal of the residuals provided that no treatment to further meaningfully reduce the toxicity or mobility of hazardous constituents is practically available. This certification may be made by the generator or owner or operator at the time of placement in the impoundment for treatment.

5. Retrofitting Variances

There is one final interpretive issue regarding the "soft hammer" provision on which the Agency solicits comment. The question is whether surface impoundments that do not meet minimum technological requirements (MTRs) applicable to new facilities, but which do satisfy one (or more) of the variances for impoundment retrofitting in section in 3005(j) can nevertheless receive "soft hammer" wastes. The Agency believes that this is a complicated question, but that the best reading is the following.

First, under section 3004(g)(6), landfills or impoundments that receive "soft hammer" wastes must be in compliance with the MTRs for new facilities. These require either double liners and leachate collection systems, or, as provided in section 3004(o)(2), alternative design and operating practices and location characteristics that prevent migration of hazardous constituents at least as effectively as double liners and a leachate collection system.

Interim status surface impoundments in existence on November 7, 1984 may receive a waiver from retrofitting the units to meet the same MTRs, but for different reasons. Thus, the following types of impoundments need not retrofit: single-lined interim status units located no closer than one-quarter mile from an underground source of drinking water, which are in compliance with applicable groundwater monitoring requirements (section 3005(j)(2)); aggressive biological treatment facilities in compliance with applicable Clean Water Act permit requirements and groundwater monitoring requirements (section 3005(j)(3)); units that are designed, operated, and located to prevent

migration of hazardous constituents to groundwater or surface water (section 3005(j)(4)); or units operating pursuant to a consent decree providing equivalent environmental protection as MTRs (section 3005(j)(13)).

These section 3005 variances may or may not be equivalent to the MTR variance standard in section 3004(o)(2). "no migration" impoundments in section 3005(j)(4), for example, would almost certainly satisfy the 3004(o)(2) standard; aggressive biological treatment impounds operating without liners might not. For this reason, the Agency does not believe that the statute automatically allows placement of "soft hammer" wastes into these types of impoundments. They do not necessarily meet the MTRs for new landfills and surface impoundments, as required by section 3004(g)(6).

Second, the Agency believes that if any section 3005(j) impoundment would actually make the demonstration called for in section 3004(o)(2), it could then receive "soft hammer" wastes. In this case, the impoundment would be satisfying the MTR applicable to new surface impoundments and should not be prohibited from receiving "soft hammer" wastes.

Third, section 3005(j)(11) provides that otherwise prohibited wastes can be placed in surface impoundments for treatment provided, among other conditions, that the impoundment either meets MTRs or satisfies the conditions of section 3005(j)(2) or (4) (single liner, one-quarter mile from an underground drinking water source, or "no migration" to groundwater or surface water). The Agency reads this provision as allowing continued receipt of "soft hammer" wastes in such impoundments; there is no apparent reason that solvent, dioxin, and California list wastes can be placed in such impoundments, but not "soft hammer" wastes. A consequence of this reading would be that treatment impoundments satisfying section 3005(j)(2) or (4), but not MTRs, and not making the MTR equivalence demonstration would be able to continue receiving "soft hammer" wastes. Section 3005(j)(3) and (13) treatment impoundments, however, would remain ineligible because these impoundments are excluded from section 3005(j)(11) eligibility. This reading is consistent with the Agency's general interpretation of section 3005(j)(11) to exclude section 3005(j)(3) and (13) impoundments. (See 51 FR 1609, January 14, 1986).

D. Disposal of Restricted Wastes Subject to an Extension of the Effective Date

RCRA section 3004(h)(4) states that a restricted waste subject to an extension of the effective date " * * * may be disposed of in a landfill or surface impoundment only if such facility is in compliance with the requirements of subsection (o)." [Emphasis added]. Section 3004(o) refers only to new, replacement, or lateral expansion landfill or surface impoundment units.

In the November 7, 1986 rulemaking (51 FR 40572), EPA interpreted the word "facility" to refer to the facility as a whole. This interpretation allows for the disposal of such wastes in landfill and surface impoundment units that do not meet the minimum technological requirements provided that all new, replacement, or lateral expansion units at the facility (if any) are in compliance with the minimum technological requirements of RCRA section 3004(o).

EPA has reevaluated its original interpretation, and now believes that Congress intended the term "facility" to refer to "unit", which is consistent with the Agency's interpretation of "facility" in section 3004(g)(6), which refers to the disposal of First Third wastes for which no treatment standards have been established. Although section 3004(g)(6) is linguistically distinguishable (since it refers to the minimum technological requirements applicable to new facilities), the Agency's initial reaction is that Congress did not intend a different result for restricted wastes subject to capacity variance and "soft hammer" provisions. Both provisions, for example, deal with the same type of situation where treatment capacity is unavailable and restricted wastes are being disposed in a type of unit for which Congress showed particular concern. In addition, section 3004(h)(4) also refers to "such faciliti[es]" immediately after mentioning landfills and surface impoundments, thus indicating that the reference to facility was intended to apply to the specific unit. Furthermore, EPA believes it is the intent of Congress to require untreated wastes to be disposed in landfill and surface impoundment units that are presumably more protective than units that do not meet the minimum technological requirements. Legislative history to section 3004(h)(4) in fact states that Congress meant to prohibit disposal of restricted wastes subject to a capacity variance in all surface impoundments or landfills except those meeting minimum technological requirements applicable to new facilities—the same language as used in

section 3004(g)(6) which the Agency views as clearly requiring the landfill and impoundment units to meet the minimum technological requirements. (See H.R. Conf. Rep. No. 1133, 98th Cong., 2d Sess., 87) (This passage in the Conference report actually refers to disposal of waste subject to a one-year case-by-case capacity variance under section 3004(h)(3), but the Agency sees no basis for not applying it to section 3004(h)(2) as well.

In justifying its original interpretation in the November 7, 1986 final rule, EPA expressed concern with the inconsistency of requiring wastes which have been granted an extension to the effective date due to a lack of sufficient treatment capacity, to go to units that were considered in determining whether treatment capacity was available, namely treatment surface impoundments required by section 3005(j)(11) to meet minimum technological requirements. This inconsistency no longer exists because the retrofitting requirements for surface impoundments become effective in November 1988. These requirements are the same whether the unit is used for disposal or treatment. Also, as old landfills (or old cells at landfills) are closed, new landfills (or new cells) will meet the minimum technological requirements. Thus, the number of units available that do not meet the minimum technological requirements has diminished and will continue to do so. Therefore, the Agency is proposing that all restricted wastes subject to an extension of the effective date be disposed of in landfills and surface impoundments only when such units meet the minimum technological requirements.

E. Relationship to California List Prohibitions

As discussed in the July 8, 1987 California list final rule preamble (52 FR 25773), and as reflected in § 268.32(h) (i.e., the overlap of the HOCs and other prohibited wastes), where the Agency makes a waste-specific determination that is more specific than the California list determination, such determinations will supersede the California list treatment standards and effective dates. The Agency intends this principle to apply to the restrictions on the land disposal of First Third wastes. While it is clear that Agency-established treatment standards or effective dates for First Third wastes are more specific than California list determinations, there is some ambiguity surrounding the applicability of the California list restrictions to "soft hammer" wastes.

Until promulgation of the restrictions on land disposal of First Third wastes, many of these wastes are subject to the California list restrictions. Once treatment standards and effective dates have been promulgated for such wastes, the California list restrictions clearly will be superseded. However, no treatment standards will have been promulgated for "soft hammer" wastes. EPA is therefore proposing that "soft hammer" wastes which are otherwise subject to the California list restrictions remain subject to the California list treatment standards and effective dates. It should be noted that if a national capacity variance has been granted for a "soft hammer" waste under the California list final rule, such a waste would remain subject to the demonstration and certification requirements of § 268.8 (as discussed in Section III. C.). This approach not only recognizes that the California list treatment standards are not actually effective for such a waste (due to the national capacity variance), but also remains consistent with the Agency's intent that where more than one regulatory requirement applies, the more stringent requirement will apply. The Agency solicits comment on its approach to the applicability of the California list prohibitions to "soft hammer" wastes.

EPA is also considering a change in the approach on the applicability of California list restrictions to wastes for which a more specific determination has been made. For First Third wastes for which treatment standards have been established, but for which the Agency has granted a national capacity variance due to inadequate capacity to treat the waste to the treatment standard, the Agency is considering an approach where such First Third wastes would remain subject to the California list prohibitions during the period of the national variance. For example, assume that a liquid metal-containing First Third waste (otherwise subject to the California list restrictions) has been granted a national capacity variance because of inadequate capacity to treat the waste to the treatment standard, yet was not granted a variance under the less stringent (in terms of concentration levels of the metal) California list prohibitions that are in effect at this time. The Agency would determine that, because capacity exists to treat the "California list" waste to allow for land disposal, the California list prohibitions still apply and the "First Third" waste would be required to comply with the California list prohibitions. The First Third treatment standard would then be

applicable on the First Third effective date.

Granting a national variance for the First Third waste in the above example based on inadequate treatment capacity could allow the land disposal of untreated wastes which may have metal concentrations exceeding that of the otherwise applicable California list prohibition levels, for which the Agency has determined that treatment to meet at least California list prohibitions is available. This approach would vitiate the measure of environmental protection achieved by treating the waste to below California list levels (or rendering the waste non-liquid). Similarly, if the Agency were to establish treatment standards for California list metals and cyanides and promulgated capacity variances because of a lack of sufficient treatment capacity to meet these standards, the wastes would still be required to be treated to meet the California list statutory prohibitions (see generally 52 FR 29992, August 12, 1987). However, EPA realizes that this constitutes a change in approach from that stated in the California list final rule (52 FR 25773) and therefore solicits comment.

F. Determination as to the Availability of the Two-Year Nationwide Variance for Solvent Wastes Which Contain Less Than 1 percent Total F001-F005 Solvent Constituents

In a June 4, 1987 technical correction notice (52 FR 21010) to the November 7, 1986 final rule prohibiting land disposal of certain spent solvent and dioxin-containing hazardous wastes, EPA promulgated an amendment to § 268.30(a)(3) reclarifying that solvent wastes that are prohibited in the hands of their initial generator—i.e., that are not subject to any applicable variance—cannot be permissibly land disposed until treated to meet the § 268.41 treatment standards. This principle applies to all residues from treatment (unless they are part of a different treatability group for which EPA has determined that no treatment capacity exists). (See 52 FR 21012, June 4, 1987 and also 52 FR 22356-22357, June 11, 1987.) Because questions have been raised regarding the policy basis for the action, and because the underlying principle is an important one which warrants the fullest consideration, EPA has decided to seek further comment on this issue, and (if comment warrants) to revise its current approach accordingly.

The Agency has stated many times that a determination as to whether a waste is restricted from land disposal is to be determined at the initial point of generation in order to avoid

compromising the integrity of the Part 268 Subpart D treatment standards (see 51 FR 41620, November 7, 1986 and 52 FR 25765, July 8, 1987). Determining the applicability of a prohibition at any later point could result in the treatment standard being supplanted.

In the case of the prohibited solvent wastes, EPA established an effective date of November 8, 1988 for restricted solvent wastes containing less than 1% total restricted solvent constituents (40 CFR 268.30(a)(3)). The determination should be made by the initial generator at the point of generation so that the § 268.41 treatment standards—which are based on data showing that these solvents' mobility can be very significantly reduced with proper treatment normally involving incineration—not be supplanted by the 1% national capacity variance level. This could occur if solvent treatment residues treated to 1% solvent constituents then became eligible for a national capacity variance; the 1% level would become a *de facto* treatment level, whereas the true, achievable treatment level would, in most cases, be orders of magnitude lower. Where capacity exists to treat the residues, this result is simply at odds with the statutory scheme embodied in section 3004(m). (See 51 FR 44620, November 7, 1986.)

There would be no reason for treatment facilities to continue treating restricted solvent wastes below the 1% level. For instance, the Agency noted that the BDAT treatment train for many restricted solvent wastes involves distillation of the solvents followed by incineration of the still bottoms from distillation. The residues of incineration should then meet the Subpart D treatment standards (assuming that incineration is conducted properly). (See 51 FR 1727, January 14, 1986.) Were the prohibition point to be determined anywhere but the point of generation of the spent solvent, there would be no reason to continue treating solvent still bottoms that contain less than 1% of the restricted solvents, even though the still bottoms are amenable to further treatment and the Subpart D treatment standards are based on further treatment.

The Agency also has indicated that where it has determined that no treatment capacity exists to treat a particular residue from treatment, then the capacity variance would apply to the residue from treatment. This could occur most normally when treatment generates a residue which belongs in a new treatability group for which the Agency has determined that there is no

existing treatment capacity (see 52 FR 22357, June 11, 1987). The Agency continues to believe that this is a sound principle.

With respect to solvent distillation bottoms, however, EPA's data indicate that a capacity variance is unwarranted. Since the initial January 14, 1986 proposal, the Agency has stated that distillation bottoms have to be treated further before they could be land disposed (see 51 FR 1724). The Agency also has found that incineration treatment capacity exists for these residues from solvent distillation. (See 51 FR 1724, 1727, and 1729, January 14, 1986; 51 FR 40615, November 7, 1986; and Capacity Background Document for November 7, 1986, Solvent Rule, pp. 63-64, 66.)

These passages all indicate that the Agency assessed the volume of distillation bottoms resulting from distillation of restricted solvent wastes and determined that there was adequate incineration capacity to treat them. These conclusions were not challenged during the solvent land disposal prohibition rulemaking, but the Agency again solicits comment, in light of operating experience since promulgation of the November 7, 1986 rule, as to whether there is adequate treatment capacity to treat residues from treatment of restricted solvent wastes where such residues contain less than 1% total solvent constituents but do not meet the applicable Subpart D treatment standards. If commenters believe that this may be the case (based on appropriate data), the Agency solicits further comment as to whether there is any basis for considering these residues to be a different treatability group.

In proposing regulatory language and soliciting comment on this issue, the Agency is not withdrawing its existing regulation. The Agency notes, however, that its earlier actions on this issue were prospective only. (See 52 FR 21010, stating that the revisions are effective on June 4, 1987.) Thus, the June 4, 1987 revisions to § 268.30(a)(3) have no applicability to any certifications made before that date or to any treatment residues land disposed before that date. (See 52 FR 21012, June 4, 1987 (item #16); *id.* at 21017 (item #62).)

G. Storage Prohibition

The storage prohibition in § 268.50 is applicable to all First Third wastes, including those wastes for which treatment standards have not been established (i.e., "soft hammer" wastes). The statutory language in RCRA section 3004(j) states that:

In the case of any hazardous waste which is prohibited from one or more methods of land disposal under this section (or under regulations promulgated by the Administrator under any provision of this section) the storage of such hazardous waste is prohibited unless such storage is solely for the purpose of the accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment or disposal.

Under RCRA section 3004(g)(6), "soft hammer" wastes are prohibited from disposal in landfills and surface impoundments unless the generator certifies that such disposal is the only practical alternative to treatment available to the generator. Therefore, "soft hammer" wastes are prohibited from "one or more methods of land disposal", and are subject to the storage prohibition.

EPA does not believe that Congress intended the storage prohibition to apply to wastes which are no longer prohibited from "one or more methods of land disposal". Should a "soft hammer" waste be subject to the certification set forth in § 268.8, this waste would no longer be prohibited from any form of land disposal. The Agency is proposing that the storage prohibition would no longer be applicable, and § 268.50 would be amended to reflect this interpretation. This is consistent with the Agency's approach to wastes which are subject to an extension of the effective date, which are also not subject to the storage prohibition.

H. Petitions To Allow Land Disposal of Prohibited Wastes

1. Overview

The statutory language of RCRA 3004 (d), (e), and (g) includes provisions allowing an interested party to petition to dispose of prohibited wastes in land disposal units, including deep injection wells, provided that the petitioner demonstrates to the Administrator "to a reasonable degree of certainty that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous." Land disposal of otherwise prohibited hazardous wastes may be allowed only where it can be demonstrated, to a reasonable degree of certainty, that the statutory standard will be met.

On November 7, 1986, EPA promulgated regulations (51 FR 40572) that provided procedures for submittal of petitions to allow land disposal of a waste prohibited under Subpart C of Part 268. The regulation (40 CFR 268.6) included the information that must be provided in a "no migration"

demonstration, the criteria the demonstration must meet, and the Agency's review and approval procedures.

Since promulgation of the November 7, 1986 final rule, the Agency has had several inquiries regarding the appropriate content of "no migration" petitions. In response to these questions, EPA is proposing additional requirements in today's rule. This rule does not, however, present the Agency's interpretation of the statutory "no migration" language of RCRA 3004 (d), (e), and (g). The Agency hopes to further address this question at a later date.

Today's notice discusses additional requirements relating to:

- (1) Other applicable laws;
- (2) Monitoring plans;
- (3) Variance departures; and
- (4) Detection of hazardous constituent migration.

A detailed discussion of these requirements is provided in Section 4.

2. Requirements for "No Migration" Petitions in the November 7, 1986 Final Rule

In the final rule published on November 7, 1986, the Agency promulgated procedures and criteria for "no migration" petitions for surface disposal units. As codified in 40 CFR 268.6 (d) through (j), EPA requires all "no migration" petitions to be submitted to the Administrator containing information that describes: (1) specific wastes and specific unit(s) involved, (2) chemical and physical characteristics of the wastes, and (3) comprehensive characterization of the disposal unit and environment.

A successful petition must meet the following criteria that form the basis for the Agency's evaluation of the demonstration for compliance with the statutory language:

- (1) Waste and environmental sampling, testing, and analysis data are accurate and reproducible;
- (2) Sampling, testing, and estimation methods for determining chemical and physical properties of wastes and environmental parameters are explained;
- (3) Simulation models used in the demonstration must be calibrated for specific waste and site conditions;
- (4) Quality assurance and quality control plan must be submitted that addresses all aspects of the demonstration;
- (5) An analysis must be performed to identify and quantify any aspects of the demonstration that contribute significantly to uncertainty. This analysis must include an evaluation of the consequences of predictable future

events, including, but not limited to, earthquakes, floods, severe storm events, droughts, or other natural phenomena; and

(6) A statement must be prepared and signed that verifies the petitioner's familiarity with all information in the petition and that the data and information is true, accurate and complete to the extent possible.

In addition to these requirements, the following provisions are applicable to units that have received a variance from the land disposal prohibitions;

(1) The petition will apply only to land disposal of specific restricted wastes at that disposal unit;

(2) The effective period of the petition can be no longer than the term of the RCRA permit if the unit is operating under a RCRA permit, or up to a maximum of 10 years from the date of approval if the unit is operating under interim status. Terms of the petition in either case will expire upon termination or denial of a RCRA permit, or upon the termination of interim status (except when interim status is terminated by the issuance of a permit), or when the waste volume limit of the disposal unit during the effective period of the petition is reached; and

(3) The petition does not relieve the petitioner of his responsibilities in the management of hazardous waste under 40 CFR Parts 260 through 271.

The applicants are required to comply with all restrictions on land disposal that are in effect during the time period in which the petition is being prepared, submitted, and reviewed until a final decision by the Administrator is made. The Administrator may request additional information as needed to evaluate the demonstration. After completing review of the application, the Administrator will announce to the public and solicit comments on his intent to approve or deny the petition in the *Federal Register*. After review of public comments, he will then publish his final decision on the petition in the *Federal Register*.

3. Regulatory Requirements of RCRA Sections 3004 (f) and (g) November 7, 1986 Final Rule

The Agency recently proposed rules to implement the land disposal restrictions of section 3004 (f) and (g) of RCRA for waste disposal in deep injection wells (52 FR 32446, August 27, 1987). While the standards applied to owners or operators of deep injection wells in these proposed rules are the same as those in today's proposal, the criteria, content, and procedures are different in that they specifically pertain to unique

technological and hydrogeologic conditions associated with injection. The reader should refer to these August 27, 1987 proposed rules for complete discussion of how the Agency intends to apply the "no migration" standards in deep injection wells.

4. Additional Requirements for "No Migration" Petitions for Surface Units

Based on review of the inquiries and comments received on the subject of "no migration" petitions, the Agency is proposing additional requirements to be effective on the date of promulgation. These requirements would be added to those already codified in 40 CFR Part 268 for "no migration" petitions for surface disposal units. Today's proposed rule provides further procedural and informational requirements applicable to those surface disposal units for which a variance from the land disposal restrictions is being sought, and does not interpret the statutory language of RCRA sections 3004 (d), (e) and (g) regarding "no migration" demonstrations. Specific information and procedural requirements of today's proposal are discussed below.

(1) Other Applicable Laws: EPA is proposing to require the petitioner to provide sufficient information in the petition demonstration to assure the Administrator that land disposal of the prohibited waste(s) (in the petition) will comply with other applicable Federal, State, and local laws (Section 268.6(d) (1)). The petitioner must review Federal, State and local laws to determine if stricter regulations must be applied to the unit for which the petition is submitted. This review is necessary to reveal environmentally sensitive areas and endangered species which must be protected. The review of Federal laws should include, but not be limited to, the Clean Air Act; the Clean Water Act; the Safe Drinking Water Act; the Endangered Species Act; the National Historic Preservation Act; the Wild and Scenic Rivers Act; the Coastal Zone Management Act; the Fish and Wildlife Coordination Act; the Atomic Energy Act; and the Marine Protection, Research, and Sanctuary Act. The review of State and local laws must be determined on a case-by-case basis. Under 40 CFR 270.3, an owner or operator seeking a RCRA permit for a unit must demonstrate compliance with several Federal laws, including some of those listed above. The Agency does not foresee that an owner or operator satisfactorily making a timely demonstration for those laws covered under § 270.3 in order to obtain a permit, will have to make another demonstration of compliance with those

same laws for the purposes of obtaining a "no migration" variance.

(2) Monitoring Plan: Under Section 268.6(d)(2) of today's proposal, EPA is proposing that petitioners submit a monitoring plan to the Administrator that describes the monitoring program installed at and/or around the unit to verify continued compliance with conditions of the variance.

This monitoring plan must be submitted as part of the "no migration" petition and must provide information on the monitoring of the unit and/or the appropriate environment around the unit, or, if monitoring the unit or the environment around the unit is either technically infeasible or impracticable, the rationale supporting the determination of infeasibility or impracticability. If the petitioner asserts that monitoring is impractical or infeasible, no monitoring plan (for the unit or environment as appropriate) need be submitted. However, the Administrator will decide if monitoring of the unit itself or monitoring of the environment around the unit, or both, is required, based on the factors supporting the variance and other information provided. If EPA decides that such a plan is necessary, the petitioner will be required to submit a plan before the final decision on the petition will be made.

If a monitoring plan is required, the petitioner must submit as part of that plan the following information:

- a. The media monitored, in cases where monitoring of the environment around the unit is required;
- b. The type of monitoring conducted at the unit, in the cases where monitoring of the unit is required;
- c. The location of the monitoring stations;
- d. The monitoring interval (frequency of monitoring at each station);
- e. The specific hazardous constituents to be monitored;
- f. The implementation schedule for the monitoring program;
- g. The equipment used at the monitoring stations;
- h. Sampling and analytical techniques employed;
- i. Data recording/reporting procedures.

The plan must include discussion of the rationale for the design of the monitoring program and demonstrate that monitoring will be positioned so as to detect migration from the unit at the earliest practicable time. Specifically, the plan must provide discussion of the monitoring program with respect to the following points

- a. Mobility and persistence of hazardous waste constituents managed in the unit;
- b. Possible migration pathways from the unit, both during the active life of the facility and through the post-closure care period;
- c. Operations at the unit;
- d. Strength of engineered and natural material components of the unit and any weak points in the unit design.
- e. Optimum location of the monitoring stations to detect any migration of hazardous constituents at the earliest practicable time.

The Agency believes that monitoring programs, either for the unit itself or the environment around the unit, or both will be required in most cases. Only in a very few instances does the Agency feel that monitoring of the unit itself or the environment around the unit may not be appropriate or technically feasible. One such case may be hazardous waste repositories in geologic formations that are so extensive that installation of monitoring wells around the formation itself may not allow detection of migration at the earliest time, and installation of monitoring wells in the formation may damage the integrity of the formation. Monitoring the repository itself (e.g., pressure monitoring of fluids between well-casings in solution-mined caverns, or leachate sumps and pumps in room-and-pillar mines) may be suitable in this case.

A monitoring program should include monitoring the behavior of wastes in the unit to detect any changes in the waste that may affect the potential for migration of hazardous constituents over time. Examples of this type of monitoring include periodic testing of the waste in a unit; leachate collection systems in surface impoundments, landfills, and room-and-pillar mines; and fluid or gas pressure monitoring in well casings above solution-mined caverns in salt domes. To avoid monitoring systems within the unit, the petitioner must show that the available technology for monitoring the unit would adversely affect the structural integrity or the waste isolation capability of the unit.

The locations of the monitoring stations in the different media outside of the unit (if applicable) and/or within the unit itself (if applicable) must be specified in the monitoring plan. Selection of the monitoring points in the media around the unit and within the unit should be based on an assessment of pollutant fate and transport and should provide for detection of releases of hazardous constituents at the earliest practicable time.

Groundwater monitoring systems must consist of a sufficient number of wells installed at appropriate locations and depths to detect migration to the ground water at the earliest practicable time. The groundwater monitoring program for conventional land disposal units, such as surface impoundments and land treatment units, should comply with 40 CFR Parts 264 and 265 standards and requirements as well as technical guidance issued by EPA to properly locate, design, drill, develop, and operate groundwater monitoring wells. Monitoring systems must consist of a sufficient number of devices located so as to detect migration of hazardous constituents from the unit at the earliest practicable time. All monitoring systems and their capabilities must be specified in the monitoring plan of the petition and approved by the Administrator.

A petitioner may be able to incorporate into his monitoring plan part or all of a groundwater monitoring program established for the purpose of complying with 40 CFR Parts 264 and 235 Subpart F. For example, a petitioner may be able to use all or some of his monitoring wells if they will detect migration at the earliest practicable time, and may only have to increase the frequency of monitoring.

The monitoring interval specified in the monitoring plan (§ 268.6(d)(2)) must provide detection of migration of hazardous constituents at the earliest practicable time. The owner or operator must submit a suggested monitoring interval for all monitoring stations and demonstrate that the frequency of monitoring at that station is adequate to detect releases of hazardous constituents at the earliest practicable time. The demonstration may be based on computer simulations or other assessments of pollutant fate and transport in the particular media. The Administrator will determine if the suggested interval is appropriate based on the evaluation of the demonstration. The monitoring interval will vary depending on the media being monitored and other site-specific factors. These factors may include climatology, environmental setting, unit design characteristics, and waste characteristics.

The Appendix VIII constituents to be monitored must be specified in the monitoring plan (§ 268.6(d)(2)). The constituents to be monitored in the unit should be determined based on knowledge of waste composition and mobility of waste components. For groundwater, the constituents to be monitored may be analogous to those monitored under Parts 264 and 265

Subpart F. Under Subpart F, depending on whether the monitoring program is in a detection, compliance, or corrective action monitoring phase, an owner or operator may be monitoring for indicator parameters, all Appendix IX constituents, or specific waste constituents. A monitoring program undertaken to demonstrate "no migration" may be able to make use of Subpart F monitoring data. Although monitoring indicator parameters under Subpart F may be helpful to demonstrate "no migration", the actual constituents to be monitored must be determined based on an analysis of the waste.

Monitoring outside the unit in the different media should include, but is not necessarily limited to, the most mobile constituents for the particular media.

Where applicable, the monitoring program described in the petition monitoring plan must be in place for a period of time specified by the Administrator prior to receipt of waste at the unit (§ 268.6(e)) or as indicated in an alternative schedule as approved by the Administrator. The monitoring program must be implemented during the time which the unit is receiving restricted waste which does not meet the treatment standards under 3004(m) and may also be necessary, in part or in total, during the post-closure care period. Although the approved petition is valid for only as long as the owner's and operator's operating permit (10 years maximum), the monitoring of media to which the wastes could potentially migrate may continue for as long as the waste remains hazardous. The objective of a monitoring program for "no migration" variances is to allow detection of migration of hazardous constituents at the earliest practicable time. During the operating life of the unit, such a detection of migration will prevent the unit from continuing to receive waste not meeting standards under 3004(m) (see discussion below). During the post-closure care period, however, the unit is no longer receiving restricted untreated waste, and the objective of *any* monitoring is to detect the need for corrective action. Thus, in most cases, groundwater monitoring other than that already required for post-closure care under §§ 264.117 and 265.117 will not be necessary. Monitoring of additional media may be necessary during the post-closure care period if the activities conducted under post-closure do not adequately protect against migration. However, the Agency does not envision that a disposal unit which has been properly closed will

pose a threat of migration through other media.

Monitoring of unit parameters, such as temperature or pressure, will not be required after closure if the monitoring activities would compromise the isolation capability of a disposal unit or would not provide data of significance to assess the unit's integrity after closure.

The monitoring program must meet the criteria in § 268.6(f):

- a. All testing, sampling and analytical techniques must be conducted according to methods contained in EPA Publication SW-846 Solid Waste Testing Methods or must be approved by the Administrator, and all data must be accurate and reproducible;
- b. Sampling, testing, estimation and modeling techniques must be provided and approved by the Administrator; and
- c. A Quality Assurance and Quality Control plan must be approved by the Administrator.

The Agency believes that the reporting of monitoring data should occur regularly, but that frequent reporting of monitoring data imposes a significant administrative burden on the owner or operator and the petition reviewer. The Agency believes that monitoring data which is collected for the purposes of demonstrating compliance with the variance and which does not reveal migration or significant changes to the site, should be reported annually to the Administrator. A schedule for reporting the data should be proposed in the petition and approved by the Administrator. The Agency is requesting comment on whether data should be reported annually, or more frequently. The Agency further believes that monitoring data may be reported to the Administrator or kept on-site as part of the operating log. The Agency is soliciting comment as to whether the monitoring data should be reported to the Administrator, kept in the operating log on-site, or both.

(3) Changes from Conditions of the Variance: Under 268.6(1) of this proposal, if there is a change from the reported conditions at or around the unit or any change affecting the unit or the area around the unit for which the petition has been granted, this change must be reported to the Administrator at the earliest practicable time. The Agency believes that any changes made at the facility that may affect any part of the unit must be reported. For example, if the owner/operator proposes to make engineering changes at the unit, these must be reported to the Administrator at least 30 days prior to the change being

made. If the monitoring plan for the unit needs to be changed or upgraded to better reflect actual conditions at the site, it must be reported to the Administrator at least 30 days prior to this proposed change. If site conditions change (i.e., environmental changes), the Administrator must also be notified of this change. The Agency realizes that some petitions will be submitted and approved prior to a unit being built. As such, the Agency believes that it is necessary to provide flexibility to change some conditions of the petition if necessary to protect against migration, or to adequately detect a release.

The Agency also realizes that conditions upon which the "no migration" variance has been granted may prove to be different once the unit is operating. For example, a petitioner may predict, based on modeling, that leachate concentration will be at a certain level and the petition was approved conditional upon that concentration. However, actual monitoring of the leachate after the unit receives restricted waste may show that levels are above those predicted. Such a change in the conditions of the variance should be reported to the Administrator. The Agency realizes that some changes may not be significant enough to warrant action, but believes that *all* changes to the unit or area around the unit, or changes that may affect unit or area around the unit must be reported, both for pending petitions and facilities already granted waivers. The Administrator will determine if such changes warrant actions such as submittal of a new petition, modifications to the variance, revocation of the variance, or no changes to the variance, among others. At this time, the Agency is unable to delineate changes which would be considered minor in their effect on the variance. As such, the Agency proposes requiring notification of *all* changes. The Agency is soliciting comment on what changes should or should not be reported. The Agency is also soliciting comment as to whether all changes or some changes need to be reported immediately or can be submitted as part of the reporting requirements for monitoring.

(4) Detection of Hazardous Constituent Migration: Under proposed § 268.6(m), if the owner or operator determines that there is a migration of hazardous constituents from the unit, the owner or operator must immediately suspend receipt of restricted wastes at the unit and notify the Administrator, in writing, within 10 days of the determination. EPA believes that ten

days is a reasonable time period for notifying the Administrator of a migration of hazardous constituents. The Agency, however, is interested in receiving comments from the public on the appropriate time period for the notification of the Administrator. EPA also believes that immediate suspension of receipt of restricted wastes is necessary in order not to compound the problem of migration.

In the notification of migration (applying to all media), the owner/operator must provide analytical data on the constituents, and an initial assessment of the cause of migration. The notification may include the owner or operator's planned response to the release. The planned response may include additional monitoring, corrective actions to remediate the release, and design or operating modifications to prevent a recurrence of the release. The notification may also suggest what response by the Agency would be appropriate.

A brief summary of the information required in a notification is provided below:

a. The analytical data to be provided must include but is not necessarily limited to the following: (1) the owner or operator must provide the constituents detected and the concentrations at which they were detected; and (2) the owner or operator must provide modeling data (if applicable) that estimates the levels of hazardous constituent migrating from the unit.

b. The notification must provide an initial assessment of possible causes of the migration. This assessment may include an evaluation of engineered components (i.e., deterioration, construction deficiencies, etc.), changes in environmental factors (i.e., climate, groundwater fluctuation, etc.), and other appropriate factors.

Following receipt of the owner or operators' notification of migration, the Administrator will determine the actions to be taken within 60 days of receiving the notification. The Administrator will make this decision based upon information provided in the monitoring plan, the "no migration" petition, and the notification. Possible responses to the notification may include revoking the owner or operator's variance, partial closing of the unit, additional monitoring, operational changes, or other appropriate responses. A petitioner would then be afforded further opportunity to comment on the Agency's decision. However, EPA believes that the Agency's (and public's) interest in having only treated wastes disposed in surface disposal units other than "no migration" units appears to outweigh any private interest in continued land disposal of untreated

wastes, and thus, justifies immediate Agency action without further right to comment before the decision.

If a final decision cannot be reached by the Agency within 60 days, the Administrator will issue a draft decision specifying temporary measures to be in effect until a final decision is reached. Temporary measures that may be specified by the Administrator include, but are not limited to, restrictions on waste types or quantities placed in the unit, additional monitoring, or unrestricted continued operations.

I. Proposed Approach to Comparative Risk Assessment

Within the regulatory framework established for implementing the land disposal restrictions, EPA included certain criteria in the determination of "available" treatment technologies. One criterion required that treatment technologies not present greater total risks than land disposal waste management practices. Although the Agency utilized comparative risk assessments in the development of regulations prohibiting land disposal of certain solvent-containing and dioxin-containing hazardous wastes (November 7, 1986 final rule) and California list wastes (July 8, 1987 final rule), the analysis did not affect the determinations that treatment was available.

Upon further consideration of the existing comparative risk analysis, the Agency believes that the approach in which the risks of land disposal are compared to the risks from alternative treatment technologies is flawed. In cases where the land disposal practice could be found to be less risky than any of the treatment alternatives, the analysis could lead to anomalous results. For example, in a situation where the comparative risk analysis indicated that land disposal was the least risky alternative available, there would be no specified treatment technology for the wastes. At the same time, land disposal would be prohibited by statute. Thus, the generator could not land dispose the wastes, even though treatment could be conducted pursuant to other regulatory standards that assure protection of human health and the environment.

A second anomaly is that unless EPA actually specifies a treatment method as the treatment standard—normally an undesirable option (see 51 FR 44725, December 11, 1986)—the regulated community may still use treatment technologies identified as riskier than land disposal to comply with the treatment standards. In this respect, the

comparative risk assessments would not deter the use of treatment found to present greater total risk.

In light of these legal and practical considerations, EPA does not believe the existing comparative risk assessment approach is warranted as a decision tool for this rulemaking in the determination of "available" treatment technologies. In the future the Agency may conduct risk analyses to distinguish between the overall degree of risk posed by alternative treatment technologies and to make determinations concerning the "best" technology based on net risk posed by the alternative practices. The Agency solicits comment on this new approach.

J. Determination of Alternative Capacity and Effective Dates for First Third Wastes

1. Quantities of Wastes Land Disposed

EPA has estimated the total quantities of First Third wastes land disposed annually based on the results of the OSW RIA Mail Survey of Treatment, Storage, and Disposal Facilities regulated in 1981. The Agency acknowledges that data from this survey are not current and may limit the accuracy of capacity analyses, but believes that this database is the only comprehensive information currently available that is specific enough to allow EPA to determine required alternative treatment capacity. EPA is developing a new database that will be used for capacity determinations. The new database will be comprised of information taken from responses to a 1987 survey of treatment, storage, disposal, and recycling facilities. Since this new capacity database will not be available until early in 1988, the capacity analyses for this proposed rule are based on the 1981 survey data. When the 1987 survey data become available EPA will reassess capacity.

Four methods of land disposal are included in the table below: Disposal in landfills; storage in waste piles; disposal by land application; and treatment, storage, and disposal in surface impoundments. Deep well injection, another method of land disposal, will be addressed in a separate **Federal Register** notice. Other methods of land disposal that are affected by today's proposal (utilization of salt dome and salt bed formations and underground mines and caves) are not addressed in the capacity analyses because of insufficient data. Similarly, there is not enough data to estimate the capacity requirements for land disposed First Third wastes generated by Small Quantity Generators

(SQGs) and form CERCLA response actions and RCRA corrective actions.

TOTAL VOLUME OF FIRST THIRD WASTES LAND DISPOSED EXCLUDING DEEP WELL INJECTED WASTES (MILLION GALLONS/ YEAR)

Disposal method	Volume
Landfill	600
Land application	100
Storage in waste piles	70
Surface impoundments:	
Storage only	990
Treatment only	1130
Storage and treatment	300
Disposal	250
Total	3440

About 250 million gallons of First Third wastes are disposed in surface impoundments annually. Ultimately, all of this waste will require alternative treatment capacity.

Approximately 990 million gallons of First Third wastes are stored in surface impoundments annually. Since storage implies a temporary containment of waste, EPA has assumed that stored wastes are eventually treated, recycled or permanently disposed of in other units. To avoid double-counting of such wastes, the volumes of wastes reported as being stored in surface impoundments were not included in the estimates of volumes requiring alternative treatment capacity. However, the Agency recognizes that, because of the restrictions on placement of wastes into surface impoundments, these wastes will eventually require alternative storage capacity.

In addition to the wastes stored, about 1.4 billion gallons for First Third wastes are treated or treated and stored concurrently in surface impoundments annually. These wastes may still be treated this way, provided that the impoundments meet the minimum technological requirements under RCRA by November 1988. However, while there are not data available to estimate the quantity of waste treated in impoundments that meet the minimum technological requirements, EPA believes that the volume is relatively small. Therefore, EPA has assumed that all First Third wastes being treated or treated and stored simultaneously in surface impoundments will require alternative treatment and storage capacity, usually in the form of either retrofitted impoundments or new tank treatment systems.

2. Required Alternative Capacity

In order to assess the requirements for alternative treatment capacity that will

result from the restrictions of today's proposed rule, the Agency first characterized the volume of First Third wastes that require alternative treatment capacity on the basis of land disposal method, waste code, and physical/chemical form. Using this information, it was then possible to determine which treatment technologies are applicable to the waste volumes and to determine the volume of alternative treatment capacity that will be required when owners/operators comply with the land disposal restrictions being proposed today.

Due to time constraints, as explained previously, Best Demonstrated Available Technology (BDAT) analyses have not been completed for all of the scheduled First Third wastes. Capacity analyses have not been performed for "soft hammer" wastes (P and U waste codes) or First Third E and K wastes for which treatment standards are not being proposed today. Furthermore, the Agency has determined that generators of the waste K069 are able to totally recycle the waste volumes generated and that the First Third wastes K004, K008, K036, K073 and K100 are no longer being generated. Since the treatment standard is set as "No Land Disposal" for wastes that are no longer generated or are totally recycled, no capacity analyses were necessary for these wastes. The table below lists the amount of waste land disposed for those First Third wastes for which treatment standards are being proposed today.

VOLUME OF FIRST THIRD WASTES, EXCLUDING DEEP WELL INJECTED WASTES, AFFECTED BY THE PROPOSED RULE (MILLION GALLONS/YEAR)

Disposal method	Volume
Landfill	220
Land application	90
Storage in waste piles	50
Surface impoundments:	
Storage only	50
Treatment only	55
Storage and treatment	30
Disposal	65
Total	580
Total (excluding Storage only)	530

Based on our analysis, EPA estimates that today's proposed rule would potentially affect about 530 million gallons of First Third wastes that are land disposed annually that will require treatment capacity.

As explained elsewhere in this preamble, EPA today is proposing treatment standards that are expressed as concentration limits and is identifying

the technology basis of the standards. EPA is not requiring that the specified treatment technologies be used to comply with standards. However, in order to evaluate the treatment capacity required for First Third wastes, EPA is assuming that the entire volume of waste estimated for each waste code will be treated using the same type of technology that forms the basis of the proposed treatment standards.

The treatment technologies used to establish proposed treatment standards fall under six categories: fluidized bed or rotary kiln incineration for K016, K018-K020, K024, K030, K037, and K048-K052, liquid injection incineration for K015, wastewater treatment for K062, wastewater treatment and incineration for K103 and K104, chemical treatment for K071 and high temperature metals recovery for K061. The volumes of First Third wastes that will require alternative treatment capacity are listed for each category in the table below.

REQUIRED TREATMENT CAPACITY FOR FIRST THIRD WASTES AFFECTED BY THE PROPOSED RULE (MILLION GALLONS/YEAR)

Technology	Required treatment capacity
Fluidized Bed or Rotary Kiln Incineration.....	170
Liquid Injection Incineration.....	<1
Wastewater Treatment for K062.....	230
Wastewater Treatment and Incineration for K103 and K104.....	30
Chemical Treatment.....	10
High Temperature Metals Recovery.....	90
Total.....	530

3. Capacity Currently Available and Effective Dates

Fluidized Bed, Rotary Kiln and Liquid Injection Incineration

EPA estimates that about 170 million gallons per year of First Third wastes will require fluidized bed or rotary kiln incineration capacity as a result of today's proposed standards.

EPA has identified rotary kiln incineration as BDAT for the wastes: K016, K018, K019, K020, K024, K030 and K037. While the treatment standards for these wastes are based on rotary kiln incineration, the Agency believes that a well-designed and well-operated fluidized bed incinerator will also achieve the treatment standards. Therefore, fluidized bed incineration capacity was included in the estimates of treatment capacity.

EPA has identified fluidized bed incineration followed by stabilization of metals in the ash as BDAT for the K048, K049, K050, K051, and K052 wastes. While the treatment standards for these wastes are not based on rotary kiln incineration, EPA believes that rotary kiln incineration in a well-designed and well-operated unit followed by stabilization of metals in the ash will also achieve the treatment standards. Therefore, rotary kiln incineration capacity was included in the estimates of treatment capacity.

Liquid injection incineration was used to establish the treatment standard for K015. While BDAT is identified as liquid injection incineration, the Agency believes that incineration in a well-designed and well-operated industrial furnace (e.g., a cement kiln) will also achieve the treatment standard. Therefore, industrial furnace capacity was included in the estimate of treatment capacity for this waste.

As the Agency determined for the Solvents and Dioxins Rule (51 FR 40572), there is not enough commercial fluidized bed or rotary kiln incineration capacity for wastes requiring these technologies and EPA lacks the information necessary for estimating on-site incineration capacity at facilities that generate these wastes. Therefore, EPA assumes that capacity is inadequate and proposes to grant a two-year national capacity variance from the effective date for the following wastes: K016, K018, K019, K020, K024, K030, K037, K048, K049, K050, K051, and K052. It should be noted that capacity analyses will be reviewed when the new data become available.

The Agency has determined that there is adequate liquid injection incineration capacity (including cement kilns) commercially available to treat K015 wastes. Therefore, EPA does not propose to grant a capacity variance for this waste.

Wastewater Treatment for K062

EPA estimates that about 230 million gallons per year of the First Third waste K062 would require wastewater treatment as a result of today's proposed rule. BDAT for K062 is identified as chromium reduction, chemical precipitation and vacuum filtration. The Agency believes that this treatment is generally available on-site and has determined for previous rules (51 FR 40572 and 52 FR 25780) that some available commercial capacity exists. Furthermore, approximately 42 percent of the K062 waste is currently being managed in surface impoundments that are subject to the minimum technological requirements under

RCRA. The Agency believes that some of these impoundments may either be retrofitted to meet the minimum technological requirements or may be replaced by newly-installed tank treatment systems. Consequently, EPA believes that adequate capacity for K062 exists or will exist prior to promulgation of the final rule. Therefore, no variance is proposed for K062.

Wastewater Treatment and Incineration for K103 and K104

EPA estimates that approximately 30 million gallons per year of the First Third wastes K103 and K104 would require wastewater treatment and incineration as a result of today's proposed rule. BDAT for these wastes is solvent extraction followed by incineration of the solvent contaminated extract and followed by steam stripping and carbon adsorption of the wastewater. The Agency estimates that about four million gallons per year (approximately 13 percent of the original volume) of solvent contaminated extract will require incineration and that the entire volume of waste will require solvent extraction followed by steam stripping and carbon adsorption.

The Agency has determined that there is adequate incineration capacity commercially available to treat the volumes of K103 and K104 generated (this includes industrial kiln capacity as well as liquid injection incineration capacity). However, EPA has determined that there is not enough solvent extraction/steam stripping/carbon adsorption capacity commercially available to treat the volumes of K103 and K104. Therefore, even though incineration capacity is available, these wastes cannot be treated to the treatment standards. Since capacity for some treatment steps is inadequate, EPA proposes to grant a two-year national capacity variance from the prohibition effective date for K103 and K104.

High Temperature Metals Recovery for K061

EPA estimates that approximately 90 million gallons of the First Third waste K061 will require high temperature metals recovery capacity annually (even though K061 is a dust, the volume is given in gallons because all volumes were reported as gallons in the RIA Mail Survey). Available data indicate that generators are not equipped to treat K061 on-site and that there is not enough commercial capacity available to treat the amount generated. Therefore, EPA proposes to grant a two-year national

capacity variance from the prohibition effective date for K061.

Chemical Treatment for K071

EPA estimates that about 10 million gallons of the First Third waste K071 would require chemical treatment annually as a result of today's proposed rule. BDAT for K071 is acid leaching and chemical oxidation for nonwastewaters and sulfide precipitation followed by filtration for wastewaters. The available data indicate that there are no commercial treatment facilities that manage this waste and that most generators are not equipped to treat K071 on-site. Therefore, EPA proposes to grant a two-year national capacity variance from the prohibition effective date for K071.

4. Capacity Variances for "Derived-From" and "Mixed" Wastes

In developing estimates of the quantity of a waste that requires treatment as a result of the land disposal restrictions, EPA attempts to define all such wastes including "derived-from" and "mixed" wastes. However, EPA's estimates of treatment capacity usually assume that all waste is treated using the same type of treatment technology that is determined to be the basis for the BDAT treatment standards.

As explained earlier in this preamble, EPA's treatment standards will apply to a range of wastes with physical and/or chemical characteristics potentially different from the waste tested. In cases where the facility believes that the appropriate treatment technology is different from the technology determined to be BDAT or that the associated effective date is inappropriate, the facility can petition for either a variance from the treatment standard or a case-by-case capacity extension. (A case-by-case extension could be granted even if a variance from the treatment standard was not requested or was denied.)

5. Capacity Variances for "Soft Hammer" Wastes

The Agency is not barred from granting capacity variances for "soft hammer" wastes, i.e. First Third wastes for which there is no treatment standard (52 FR 25774-775, July 8, 1987). The Agency, however, has discretion as to whether or not to grant such variances. [See RCRA section 3004(h)(2) ("The Administrator may establish an effective date different from the effective date which would otherwise apply * * *" (emphasis added)).] The Agency believes it inappropriate to consider capacity variances for "soft

hammer" wastes because section 3004(g)(6) functions as an individualized capacity determination. Generators of wastes destined for disposal in landfills or impoundments, in effect, must make their own search of practically available treatment and certify the results. The Agency thus believes it would be an inefficient use of its own resources (and possibly an undermining of the "soft hammer" scheme) if it were to undertake its own independent capacity determination for "soft hammer" wastes.

IV. Modifications to the Land Disposal Restrictions Framework

Today's proposal does two things. First, it proposes the Agency's approach to restricting the land disposal of First Third wastes, presenting the conditions under which land disposal of these wastes may be continued. Second, it proposes modifications to the existing framework of the Land Disposal Restrictions Program, as first promulgated on November 7, 1986 (51 FR 40572) and subsequently modified in the July 8, 1987 California list final rule (52 FR 25760). Unless otherwise specified, these proposed modifications will apply to all other restricted wastes. This section of today's proposal summarizes these modifications and refers to more detailed discussions in other sections of this preamble.

A. General Waste Analysis (§§ 264.14 and 265.13)

The Agency has proposed modifications to §§ 264.13 and 265.13 to reflect provisions for the treatment of "soft hammer" wastes in surface impoundments. The framework promulgated November 7, 1986 provided for an exemption allowing treatment of restricted wastes in surface impoundments meeting the minimum technological requirements (i.e., double liner, leachate collection system, and groundwater monitoring), provided that residuals that do not meet the treatment standard are removed annually. As discussed in Section III. C. 3., this exemption is extended to allow for wastes subject to the "soft hammer" provision (i.e., wastes for which no treatment standard has been established). Nonsubstantive modifications are also proposed to make these sections more readable.

B. Operating Record (§ 264.73 and § 265.73)

The Agency is proposing to modify § 264.73 and § 265.73 to require retention of the § 268.8 certification, i.e. the certification applicable to "soft hammer" wastes. EPA is also proposing

to require that facilities retain the new tracking notice required under § 268.7 for generators sending "soft hammer" wastes to receiving facilities, and for treatment facilities sending "soft hammer" wastes to a disposal facility. The proposed notice and certification is discussed further in Sections III. B. 2. and III. C. 2. respectively.

C. Purpose, Scope, and Applicability (§ 268.1)

The Agency is proposing to modify § 268.1 only to include the "soft hammer" wastes in the applicability of the land disposal restrictions, and to allow the disposal of such wastes in landfill and surface impoundment units meeting the minimum technological requirements provided such wastes are the subject of a valid certification under § 268.8.

D. Treatment in Surface Impoundment Exemption (§ 268.4)

The proposed modifications to the requirements of § 268.4 reflect the special conditions for allowing this exemption to apply to First Third wastes for which no treatment standards have been established. Certain nonsubstantive modifications have also been proposed to improve the readability of the section. The conditions relating to the disposal of "soft hammer" wastes are discussed in Section III. C. 3.

E. Case-by-Case Extensions (§ 268.5)

The modification to § 268.5 reflects the Agency's new interpretation of RCRA section 3004(h)(4), that wastes subject to a case-by-case extension of the effective date, if disposed in a landfill or surface impoundment, must be disposed in a unit that meets the minimum technological requirements. EPA's earlier interpretation was that Congress intended such wastes to be disposed in a facility that meets the minimum technological requirements. The discussion for this proposed change is found in Section III. D.

F. "No Migration" Petitions (§ 268.6)

As discussed in Section III. H., the Agency is proposing modifications to the existing requirements for petitioning EPA for a "no migration" exemption under § 268.6.

G. Testing and Recordkeeping (§ 268.7)

The proposed modifications to § 268.7 extend the notification and certification requirements to include the First Third wastes. EPA is also proposing to apply the recordkeeping requirements of this section to treatment and storage

facilities not already included in the "cradle-to-grave" paper trail, including an additional change addressing wastes that may be land disposed under an extension, exemption, or variance. Also, a new notification is proposed for "soft hammer" wastes. The discussion for these proposed modifications is found in Section III. B.

Testing requirements for wastes in § 268.43 (i.e., wastes for which the treatment standards are expressed as concentration levels in the waste, rather than in the waste extract) have been proposed. And finally, other nonsubstantive modifications are being proposed to improve the readability of this section.

H. Landfill and Surface Impoundment Disposal Restrictions (§ 268.8)

The Agency is proposing a new § 268.8 which addresses the prohibition on disposal of First Third wastes for which treatment standards have not been established. An extensive discussion in Section III. C. presents the Agency's interpretation of RCRA section 3004(g)(6)(A), which is applicable to the disposal of such wastes in landfills and surface impoundments, and also proposes EPA's approach to the type of information which must be supplied and certified to prior to such disposal.

I. Waste Specific Prohibitions—First Third Wastes (§ 268.33)

Section 268.33 proposes the actual prohibitions on the land disposal of First Third wastes (wastes listed in § 268.10) for which EPA has proposed treatment standards, and also proposes effective dates based on the availability of capacity to treat these wastes. Section III. A. describes the development of these proposed treatment standards, and Section III. J. presents the capacity data and assumptions on which the proposed effective dates are based. Section 268.33(e) proposes the prohibitions placed on "soft hammer" wastes, as discussed in Section III. C.

It should be noted that the schedule for waste K019 (a Second Third waste listed in § 268.11) has been accelerated to include this waste in the First Third. K100 (a Third Third waste listed in § 268.12) is also included in the First Third.

J. Treatment Standards (§ 268.40, § 268.41, and § 268.43)

Proposed treatment standards, expressed as concentration levels in both the waste (§ 268.43, as expressed in a new Table CCW) and in a waste extract developed by using the TCLP, are presented in proposed amendments

to Subpart D. The treatment standards are discussed in Section III. A.

K. Storage Prohibition (§ 268.50)

Only a slight modification to the existing storage prohibition in § 268.50 is proposed to account for the Agency's interpretation of RCRA section 3004(j), as applicable to "soft hammer" wastes which are the subject of a certification under § 268.8. This interpretation is presented in Section III. G. of this notice.

V. 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. Following authorization, EPA retains enforcement authority under sections 3008, 3013, and 7003 of RCRA, although authorized States have primary enforcement responsibility. The standards and requirements for authorization are found in 40 CFR Part 271.

Prior to HSWA, a State with final authorization administered its hazardous waste program in lieu of EPA administering the Federal program in that State. The Federal requirements no longer applied in the authorized State, and EPA could not issue permits for any facilities that 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.

In contrast, under RCRA section 3006(g) (42 U.S.C. 6926(g)), new requirements and prohibitions imposed by HSWA take effect in authorized States at the same time that they take effect in nonauthorized States. EPA is directed to carry out these 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, HSWA applies in authorized States in the interim.

Today's rule is proposed pursuant to sections 3004(d) through (k), and (m), of RCRA (42 U.S.C. 6924). Therefore, it will be added to Table 1 in 40 CFR 271.1(j), which identifies the Federal program requirements that are promulgated pursuant to HSWA and take effect in all States, regardless of their authorization status. States may apply for either interim or final authorization for the

HSWA provisions in Table 1, as discussed in the following section. When this rule is promulgated, Table 2 in 40 CFR 271.1(j) will be modified also to indicate that this rule is a self-implementing provision of HSWA.

B. Effects on State Authorizations

As noted above, EPA will implement today's proposal in authorized States until their programs are modified to adopt these rules and the modification is approved by EPA. Because the rule is promulgated pursuant to HSWA, a State submitting a program modification may apply to receive either interim or final authorization under RCRA section 3006(g)(2) or 3006(b), respectively, on the basis of requirements that are substantially equivalent 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 HSWA interim authorization will expire on January 1, 1993 (see 40 CFR 271.24(c)).

Section 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 modification to EPA for approval. The deadline for the State to modify its program for this proposed regulation will be determined by the date on which this regulation is promulgated in final form. Since final rule promulgation will be after July 1, 1987, State program modifications must be made by July 1, 1991, if only regulatory changes are necessary or July 1, 1992, if statutory changes are necessary. These deadlines can be extended in exceptional cases (see § 271.21(e)(3)).

States with authorized RCRA programs may have requirements similar to those in today's proposal. These 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 these requirements in lieu of EPA until the State program modification is 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 agreements to minimize duplication of efforts. In many cases, EPA will be able to defer to the States in their efforts to implement their programs rather than take separate actions under Federal authority.

States that submit official applications for final authorization less than 12 months after the effective date of these regulations may be approved without including equivalent standards. However, once authorized, a State must modify its program to include standards substantially equivalent or equivalent to EPA's within the time periods discussed above.

The amendments being proposed today need not effect the State's Underground Injection Control (UIC) primacy status. A State currently authorized to administer the UIC program under the Safe Drinking Water Act (SDWA) could continue to do so without seeking authority to administer these amendments. However, a State which wished to implement Part 148 and receive authorization to grant exemptions from land disposal would have to demonstrate that it had the requisite authority to administer sections 3004 (f) and (g) of RCRA. The conditions under which such an authorization may take place are summarized above, and are discussed in 50 FR 28728, et seq., July 15, 1985.

C. State Implementation

There are three unique aspects of today's proposal which affect State implementation and impact State actions on the regulated community:

1. Under Part 268, Subpart C, EPA is proposing land disposal restrictions for all generators and disposers of certain types of hazardous waste. In order to retain authorization, States must adopt the regulations under this Subpart since State requirements can be no less stringent than Federal requirements.

2. Also under Part 268, EPA may grant a national variance from the effective date of land disposal prohibitions for up to two years if it is found that there is insufficient alternative treatment capacity. Under § 268.5, case-by-case extensions of up to one year (renewable for one additional year) may be granted for specific applicants lacking adequate capacity.

The Administrator of EPA is solely responsible for granting variances to the effective date because these determinations must be made on a national basis. In addition, it is clear that RCRA section 3004(h)(3) intends for the Administrator to grant case-by-case extensions after consulting the affected States, on the basis of national concerns which only the Administrator can evaluate. Therefore, States cannot be authorized for this aspect of the program.

3. Under § 268.44, the Agency may grant a waste-specific variance from a treatment standard in cases where it

can be demonstrated that the physical or chemical properties of the waste differ significantly from wastes analyzed in developing the treatment standard, and, the waste cannot be treated to specified levels or treated by specified methods.

The Agency is solely responsible for granting such variances since the result of such an action will be the establishment of a new waste treatability group. All wastes meeting the criteria of this new waste treatability group will also be subject to the variance, and thus, granting such a variance has national impacts. Therefore, this aspect of the program is not delegated to the States.

4. Under § 268.6, EPA may grant petitions of specific duration to allow land disposal of certain hazardous waste where it can be demonstrated that there will be no migration of hazardous constituents for as long as the waste remains hazardous.

States which have the authority to impose bans may be authorized under RCRA section 3006 to grant petitions for exemptions from bans. Decisions on site-specific petitions do not require the national perspective required to ban waste or grant extensions. However, the Agency expects few "no migration" petitions and so will be handling them at Headquarters, though the States may be authorized to grant these petitions in the future. The Agency expects to gain valuable experience and information from review of "no migration" petitions which may affect future land disposal restrictions rulemakings. In accordance with RCRA section 3004(i), EPA will publish notice of the State's final decision on petitions in the Federal Register.

States are free to impose their own disposal bans if such actions are more stringent or broader in scope than Federal programs (RCRA section 3009 and 40 CFR 271.1(i)). Where States impose such prohibitions, the broader and more stringent State ban governs.

VI. Effects of the Land Disposal Restrictions Program on Other Environmental Programs

A. Discharges Regulated Under the Clean Water Act

As a result of the land disposal restrictions program, the regulated community might switch from treatment (BDAT) and land disposal for some restricted First Third wastes to discharge to publicly owned treatment works (POTWs); this switch would be based on waste management costs and treatment availability after the land disposal restrictions took effect. In

shifting from treatment and land disposal to discharge to POTWs, an increase in human and environmental risks could occur. Also as a result of the land disposal restrictions, hazardous waste generators could illegally discharge their wastes to surface water without treatment, which could cause damage to the local ecosystem.

Some generators might treat their wastes prior to discharging to a POTW, but the treatment step itself could increase risks to the environment. For example, if incineration were the pretreatment step, metals and other hazardous constituents present in air scrubber waters could be discharged to surface water. However, the amount of First Third waste shifted to POTWs would be limited by such factors as the physical form of the waste, the degree of pretreatment required prior to discharge, and State and local regulations.

B. Discharges Regulated Under the Marine Protection, Research, and Sanctuaries Act (MPRSA)

Management of some First Third wastes could be shifted from treatment (BDAT) and land disposal to ocean dumping and ocean-based incineration. If the cost of ocean-based disposal plus transportation were lower than the cost of land-based treatment, disposal, and transportation, this option could become an attractive alternative. In addition, ocean-based disposal could become attractive to the regulated community if land-based treatment capacity were not available.

An increase in ocean-based disposal could lead to an increase in risk to the marine environment. For example, ocean dumping of toxic hazardous wastes could cause increased risks for sensitive marine organisms. Stack emissions from ocean-based incinerators might contain metals and persistent organic chemicals that could be deposited in the ocean and have potentially toxic effects on marine life. In addition, accidental spills and releases in the ocean could have severe effects on coastal and marine resources.

Management of restricted First Third wastes could not be automatically shifted to ocean dumping and ocean-based incineration based on costs alone. Both technologies require permits, which could be issued only if technical requirements (e.g., physical form and heating value) and MPRSA environmental criteria (e.g., constituent concentrations, toxicity, solubility, density, and persistence) were met. MPRSA requires that nine specific factors, including the availability and impacts of land-based disposal

alternatives, be considered before permits can be issued for ocean disposal.

C. Air Emissions Regulated Under the Clean Air Act

Some treatment technologies applicable to First Third wastes could result in cross-media transfer of hazardous constituents to air. For example, incineration of metal-bearing wastes could result in metal emissions to air. Some constituents, such as chromium, can be more toxic if inhaled than if ingested. As a result, it might be necessary to issue regulatory controls for some technologies to ensure they are operated properly.

The Agency has taken several steps to address this issue. EPA has initiated a program to address metal emissions from incinerators. It has also initiated two programs under section 3004(n) to address air emissions from other sources. The first program will address fugitive emissions from equipment such as pumps, valves, and vents from units processing concentrated organic waste streams. The second program will address other sources of air emissions, such as tanks and waste transfer and handling.

VII. Regulatory Analyses

A. Regulatory Impact Analysis

1. Purpose

The Agency estimated the costs, benefits, and economic impacts of today's proposed rule. These analyses are required for "major" regulations as defined by Executive Order No. 12291. The Agency is also required under the Regulatory Flexibility Act to assess small business impacts resulting from the proposed rule. The cost and economic impact analyses serve, additionally, as a measure of the practical capability of facilities to comply with the proposed rule.

The results indicate that today's rule is a major rule. This section of the preamble discusses the results of the analyses of the proposed rule as detailed in the draft Regulatory Impact Analysis (RIA) for the proposed rule. The draft RIA is available in the public docket for this proposal.

The analyses presented in this section and in the draft RIA do not fully reflect the current status of the proposed rule. Certain wastes were included in the RIA, but, due to the additional time required to set treatment standards for the wastes, were not part of the proposed rule. Treatment standards were set in the proposed rule for other wastes which did not appear in the database used for the RIA. In addition,

for a few wastes, the treatment standards presented in the proposed rule differ, in varying degrees, from those assumed initially in the RIA. These discrepancies will be addressed in the RIA for a subsequent First Third proposed rule.

2. Executive Order No. 12291

Executive Order No. 12291 requires EPA to assess the effect of proposed Agency actions and alternatives during the development regulations. Such an assessment consists of a quantification of the potential benefits and costs of the rule, as well as a description of any beneficial or adverse effects that cannot be quantified in monetary terms. In addition, Executive Order No. 12291 requires that regulatory agencies prepare a Regulatory Impact Analysis (RIA) for major rules. Major rules are defined as those likely to result in:

- An annual cost to the economy of \$100 million or more; or
- A major increase in costs or prices for consumers or individual industries; or
- Significant adverse effects on competition, employment, investment, innovation, or international trade.

The Agency has prepared an RIA which compares the proposed rule with a regulatory alternative, as discussed in the following sections. Based on this analysis, the Agency has concluded that this proposed regulation is a major rule with an annual cost to the economy ranging from \$681-696 million per year.

3. Basic Approach/Regulatory Alternatives

EPA is proposing to set treatment standards for a subset of the First Third K wastes and to let "soft hammers" fall on all First Third P and U wastes. As indicated earlier in the preamble, the Agency will continue to analyze treatment data for additional First Third F and K wastes and will publish a supplemental proposal. When the proposal is published, the impacts of meeting the land disposal restrictions requirements for these wastes will be identified.

The "soft hammers" place restrictions on the land disposal of First Third wastes for which no treatment standards have been set by August 8, 1988. The "soft hammer" provisions would be in effect until "hard hammers" fell (on May 8, 1990) or for an even shorter period if treatment standards or extensions of the effective date were promulgated. The effect of "hard hammers" falling on wastes and of extensions of the effective date were not examined as part of this analysis. The "soft hammers", as well as the proposed

rule as a whole, are discussed in greater detail in Section III of this preamble.

EPA estimated the costs, benefits, and potential economic impacts of the proposed rule and of a major regulatory alternative to it. However, only the impacts of the proposed rule are presented here. Results for the regulatory alternative are discussed in the RIA.

Provisions of the proposed rule, as analyzed in the RIA, are as follows:

Proposed Rule:

- Treatment standards are established for 30 F and K wastes, and
- "Soft hammers" are allowed to fall on P and U wastes.

The costs and benefits of two "soft hammer" scenarios were examined:

Scenario 1:

- "Soft hammers" fall on P and U wastes and treatment capacity is assumed not to exist;
- Therefore, P and U wastes may continue to be land disposed in units meeting minimum technological requirements.

Scenario 2:

- "Soft hammers" fall on P and U wastes and treatment capacity is assumed to exist;
- Therefore, P and U wastes must meet "approximate treatment standards" (treatment that will reduce the mobility and toxicity of hazardous constituents).

It was assumed that the "soft hammers" would apply to wastes disposed of in landfills, surface impoundments, waste piles, and land farms. While neither scenario corresponds exactly to the proposed rule, it was assumed that the two scenarios would establish upper and lower bounds on the effects of the proposed rule. The scenarios were also used to explore some of the implications of varying "soft hammer" requirements.

The effects of the proposed rule (with "soft hammer" scenarios) were estimated by comparison of post-regulatory costs, benefits, and economic impacts with those resulting under baseline conditions. The baseline is continued land disposal of wastes in units meeting minimum technological requirements.

4. Methodology

a. *Determination of Affected Population and Waste Management Practices.* The first step in determining the populations of affected wastes and facilities was to characterize waste streams based on available characterization reports and professional judgment. (See Section D for references.) This characterization

data was matched with information on waste quantities and management practices from the 1981 RIA Mail Survey and the 1984 Small Quantity Generator Survey to determine the waste streams and facilities potentially affected by the proposed rule. Waste quantities and numbers of facilities from each survey were scaled up, by means of weighting factors, to represent the national population of wastes and facilities.

Next, it was necessary to adjust the affected waste and facility populations by considering the cost of compliance with regulations which have taken effect since the 1981 RIA Mail Survey was conducted. In particular, EPA adjusted reported waste management practices to reflect compliance with the provisions of 40 CFR Part 264, which apply to permitted treatment, storage, and disposal facilities. In making this adjustment, the Agency assumed the facilities would elect the least costly methods of compliance.

This adjustment defines not only baseline management practices and costs associated with them, but also the number of facilities and waste streams in the affected population. For example, for some facilities, the costs of land disposing of certain wastes may have been driven so high by the minimum technological requirements that other management modes became less expensive. EPA assumes that these facilities no longer land dispose of these wastes and that these wastes are no longer part of the population of waste streams that may be affected by any restrictions on land disposal.

Finally, it was necessary to consider the overlap between First Third wastes and California list, solvent, and dioxin wastes. A number of First Third wastes are California list wastes, and a few First Third mixed wastes contain solvents and dioxins. To isolate the impacts of this proposed rule, it was necessary to "net out" the costs, economic impacts, and benefits stemming from treatment standards established under other rules; in some cases this resulted in waste streams and facilities being dropped from the affected population for this rule.

The logic used to net out overlapping costs, economic impacts, and benefits is illustrated for First Third wastes which are also California list wastes:

If:	Then:
The First Third treatment for the waste stream is the same as the California list treatment	Drop the waste stream from the analysis (since there would be no incremental impacts due to the First Third proposed rule).

If:	Then:
The First Third treatment adds one or more steps to the California list treatment.	Include the waste in the analysis; estimate the incremental costs; economic impacts, and benefits due to the added treatment step(s).
The First Third treatment differs substantially from the California list treatment.	Include the waste in the analysis; estimate the incremental costs, economic impacts, and benefits due to the new treatment.

The population of wastes which would be affected by the proposed rule may include some wastes from CERCLA responses or RCRA corrective actions. However, there are insufficient data at present to estimate these quantities. Underground injected wastes were excluded from this analysis; these wastes will be dealt with in the RIA for a separate rule.

The population of affected facilities includes:

- Commercial hazardous waste treatment, storage, and disposal facilities (commercial TSDFs), which charge a fee for hazardous waste disposal;
- Non-commercial TSDFs, which provide disposal services for wastes generated on-site or off-site by their parent firms;
- generators, which send their waste off-site to commercial TSDFs for disposal; and
- small quantity generators (SOGs), which send their waste off-site to commercial TSDF.

b. Cost Methodology. Once waste quantity, type and method of treatment were known for the affected population, EPA developed estimates of costs of compliance for individual facilities. The analysis detailed in this section is based on cost estimates for surveyed facilities representing the affected population. EPA estimated baseline and compliance waste management costs using engineering judgment. Wastes amenable to similar types of treatment were grouped to identify economies of scale available through co-treatment and disposal.

Facilities face several possible options if they may no longer land dispose of their wastes. EPA applied the same rationale in predicting facility choice among these options as it did in establishing the affected population: facilities were assumed to elect the least costly method of complying with the requirements of this rule. Costs of compliance were derived by predicting the minimum-cost method of compliance with land disposal restrictions for each facility and calculating the increment

between that and baseline disposal costs. As in the analysis of baseline costs, economies of scale in waste management were considered. Shipping costs for wastes sent off-site for management were also considered.

EPA developed facility-specific compliance costs in two components, which were weighted and then summed to estimate total national costs of the rule. The first component of the total compliance cost is incurred annually for operation and maintenance (O&M) of alternative modes of waste treatment and disposal. The second component of the compliance cost is a capital cost, which is an initial outlay incurred for construction and depreciable assets. Capital costs were restated as annual values by using a capital recovery factor based on a nominal interest rate of 9 percent. These annualized capital costs were then added to yearly O&M costs to derive an annual compliance cost.

c. Economic Impact Methodology. (1) Non-Commercial TSDFs and SQGs. EPA assessed economic impacts on non-commercial TSDFs and SQGs in several steps. First, the Agency employed a general screening analysis to compare facility-specific incremental costs to financial information about firms, disaggregated by Standard Industrial Classification (SIC) and number of employees per facility. (See Section D for references.) This comparison was based on two ratios, which were used to identify facilities likely to experience adverse economic effects. The first is a ratio of individual facility compliance costs to costs of production. This ratio represents the percent product price increase for facility output that occurs if the entire compliance cost—accompanied by facility profit—is passed through to customers in the form of higher prices. A change exceeding five percent is considered to imply a substantial adverse economic effect on a facility. The second is a coverage ratio cash from operations to costs of compliance. This ratio represents the number of times that facility gross margin covers the regulatory compliance cost if the facility fully absorbs the cost. For this ratio, a value of less than 20 is considered to represent a significant adverse effect. The coverage ratio is the more stringent of the two ratios, but exceeding the critical level in either one suggests that a facility is likely to be significantly affected. These ratios bound possible effects on individual firms. This analysis considers only pre-tax costs, because Census data are stated in pre-tax terms.

Once facilities experiencing adverse economic effects were identified using

the two screening ratios, a more detailed financial analysis was performed to verify the results and to focus more closely on affected facilities. For this subset of facilities, the coverage ratio was adjusted by allowing a portion of costs to be passed through. Economic effects on individual facilities were examined assuming that product price increases of one and five percent were possible. Those facilities for which the coverage ratio was less than two were considered likely to close.

(2) *Commercial TSDFs.* For this group of facilities, there exists no Census SIC from which to draw financial information. Two SICs which might be used as proxies, 4953 and 4959, do not distinguish between financial data for hazardous waste treatment firms and for firms managing municipal and solid wastes. Consequently, the analysis of economic effects on commercial facilities was qualitative. This analysis included an examination of the quantity of waste each facility received from the waste group restricted by today's rule. EPA also examined the ability of each facility to provide the additional treatment required once these restrictions were promulgated, and thus to retain or expand that portion of its business generated by restricted wastes.

(3) *Generators.* EPA's analysis of the economic effects of this rule on generators disposing of large quantities of affected wastes off-site assumed that commercial facilities could entirely pass on to them the costs of compliance with this regulation in the form of higher prices for waste management services. Because of data limitations in the RIA Mail Survey, EPA did not develop plant-specific waste characterization, treatment methods, and compliance costs for generators, as it did for TSDFs. The analysis of the economic effects of today's proposed rule on this group used RIA Mail Survey data to develop model plants generating average waste quantities. This allowed EPA to assess possible effects on generating plants.

d. *Benefits Methodology.* The benefits of today's proposed rule were evaluated by considering the reduction in human health risk that results from using alternative treatment for First Third wastes rather than employing baseline management practices. Human health risk is defined herein as the probability of injury, disease, or death over a given time (70 years) due to responses to doses of disease causing agents. Due to time and budget constraints, risk results were obtained for only selected, potentially high-risk waste streams, which were selected based on previous analyses and professional judgment.

The human health risk posed by a waste management practice is a function of the toxicity of the chemical constituents in the waste stream and the extent of human exposure to the constituents. The likelihood of exposure is dictated by hydrogeologic and climatic settings at land disposal units and the fate and transport of chemical constituents in environmental media.

EPA estimated human health risk in four steps. The first step was to estimate the concentrations of each of the hazardous constituents of the waste stream in each of the three media (air, surface water, ground water) into which they might be released by a certain waste management technology. These estimates depend on the steady-state (i.e., continuous) release rates calculated for each technology, and on environmental fate and transport characteristics for constituents.

The next step was to estimate the total human intake, or dose, of each of the chemicals through inhalation of air and ingestion of ground water, surface water, and contaminated fish. A 65 kilogram person was assumed to be continuously exposed to contaminated media over a 70-year lifetime.

The Agency next calculated the risk to an individual from the dose derived in the previous step. EPA estimated the relationship of dose to effect (using a "dose-response" curve developed based on toxicity data) and weighted the effect according to severity.

Finally, EPA estimated the population risk by multiplying the average individual risk by the number of people in a given environment. The whole process described above was repeated 2,000 times, using different population sizes and environmental settings drawn from representative distributions, to generate a population risk distribution for each waste-technology combination. The mean of the distribution for the baseline disposal technology was compared with the mean of the distribution for an alternative treatment technology to derive the net benefit of the land disposal restrictions for that waste stream. Risks were not discounted.

Benefits other than reduction in human health risk—such as resource damage avoided and corrective action costs avoided—were not quantified. As a result, the benefits of the land disposal restrictions for First Third wastes are likely to be understated. (Other benefits measures will be addressed in RIAs for subsequent rules.)

5. Results

a. *Affected Population.* The number of affected facilities is shown in Table 1.

TABLE 1.—NUMBER OF AFFECTED FACILITIES

	Proposed rule	
	Scenario 1	Scenario 2
Commercial TSDFs	84	84
Non-Commercial TSDFs	260	253
Generators	2,47	2,443
SQGs	1,320	1,320
Total	4,111	4,100

b. *Costs.* The costs of the proposed rule are summarized in Table 2.

TABLE 2.—COSTS OF THE PROPOSED RULE (ANNUALIZED INCREMENTAL COST IN MILLIONS OF 1987 DOLLARS)

	Proposed rule	
	Scenario 1	Scenario 2
Treatment of F and K Wastes	681	681
Soft Hammers on P and U Wastes	0	15
Total	681	696

As shown, the proposed rule is a major rule, with costs of \$681–\$696 million per year. Nearly all of the costs of the proposed rule are due to the treatment of F and K wastes. The F and K wastes are high-volume wastes; large portions of the wastes go to incineration, high temperature metals recovery, and stabilization under the proposed rule. The residuals from the wastes which are incinerated often require solidification due to the metal content of the ash.

The P and U wastes, on the other hand, are generated in relatively small quantities. Their management under the proposed rule depends on which scenario is considered. Under Scenario 1, the wastes continue to be land disposed in units meeting minimum technological requirements. Under Scenario 2, the wastes are mostly incinerated; however, since the P and U wastes are primarily organic with little metal content, the ash from incineration generally does not require solidification.

Under the proposed rule, the two "soft hammer" scenarios result in relatively little difference in cost. Scenario 1—continued land disposal of P and U wastes—results in zero incremental cost over the baseline. Scenario 2—treatment of P and U wastes under "approximate treatment standards"—results in low costs due to the small volume of waste going to treatment. The costs associated with "soft hammers" would be incurred for less than two years, i.e., until "hard hammers" fell, treatment standards

were established, or extensions to the effective date were granted. Since P and U wastes result from spills or are off-spec chemical products, the assumption that quantities reported in EPA's surveys represent annual values may overstate the costs if production occurs sporadically.

Large volumes of wastes stored in surface impoundments dropped out of the analysis because storage in tanks was found to be less expensive than storage in surface impoundments in the baseline. As a result, the costs of the rule associated with treatment of residuals from storage surface impoundments were quite small. Large volumes of wastes treated in surface impoundments remained in the analysis. However, the small quantity of dredged material from these impoundments requiring treatment caused these costs to be low as well.

Most of the costs of the rule are borne by generators and noncommercial TSDFs; generators account for approximately three quarters of compliance costs and non-commercial TSDFs for approximately a quarter. SQGs account for less than one percent of total compliance costs.

c. Economic Impacts. The economic impacts of the proposed rule are summarized in Table 3.

TABLE 3.—NUMBER OF SIGNIFICANTLY IMPACTED FACILITIES

	Proposed rule	
	Scenario 1	Scenario 2
Commercial TSDFs	(¹)	(¹)
Non-Commercial TSDFs	68	72
Generators	1,040	1,049
SQGs	441	673
Total	1,549	1,794

¹ Commercial TSDFs were assumed to pass all compliance costs through to generators; therefore, the number of significantly affected facilities was not calculated.

Most of the significantly impacted non-commercial TSDFs are from the petroleum refining and primary metals industries (SICs 29 and 33, respectively). Significantly impacted generators are mostly from Primary Metals and Fabricated Metals (SICs 33 and 34, respectively). Commercial TSDFs fall primarily into Electric, Gas, and Sanitary Services (SIC 49); those facilities specializing in land disposal services could be adversely affected. The most significant difference between Scenarios 1 and 2 is in the number of significantly affected SQGs. As discussed above, impacts due to "soft

hammer" provisions would be of less than two years duration.

d. Benefits. Table 4 summarizes the estimated benefits of the proposed rule. The annual values were obtained by dividing the total benefit estimates (corresponding to a 70 year lifetime) by 70.

TABLE 4.—BENEFITS OF THE PROPOSED RULE (NUMBER OF ADVERSE HEALTH EFFECTS AVOIDED PER YEAR)

	Proposed rule	
	Scenario 1	Scenario 2
Treatment of F and K Wastes	130	130
Soft Hammers on P and U Wastes	0	78
Total	130	208

The results above are driven primarily by two waste codes; K061 and P070. K061 is emission control dust/sludge from the primary production of steel in electric furnaces; it contains a number of metals. It is mostly landfilled in the baseline and goes to high temperature metals recovery under the proposed rule. P070 is Aldicarb, a pesticide which is land applied in the baseline and incinerated under the proposed rule.

As shown, there is a substantial difference in benefits between Scenarios 1 and 2 under the proposed rule due primarily to the management of P070. Most of the risk associated with land application in the baseline is due to exposure via air. It is likely, in actual practice, that air exposures would be reduced through the use of protective gear by persons involved in land application and the restriction of access by other persons to the site; therefore the difference in benefits between the two scenarios may be overstated. The difference may also be overstated to the extent that the P and U wastes are generated sporadically, rather than annually as reported in the RIA Mail Survey. The benefits under Scenario 2 would be of less than two years duration; i.e., they would continue until "hard hammers" fell, treatment standards were set, or extensions to the effective date were granted.

e. Cost Effectiveness. The cost effectiveness of the proposed rule is illustrated in Table 5. Compliance costs for the regulated community and human health risk reduction are the basis for the comparison; other potentially significant costs (e.g., Agency implementation costs) and benefits (e.g., natural resource damage avoided) were not estimated.

TABLE 5.—COST EFFECTIVENESS OF PROPOSED RULE.

	Proposed rule	
	Scenario 1	Scenario 2
Costs (Millions of 1987 Dollars per year)	681	696
Benefits (Adverse Health Effects Avoided per Year)	130	208
Cost Effectiveness (Millions of Dollars per Case Avoided)	5.2	3.3

B. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (i.e., small businesses, small organizations, and small governmental jurisdictions). This analysis is unnecessary, however, if the Agency's administrator certifies that the rule will not have a significant economic effect on a substantial number of small entities.

EPA evaluated the economic effect of the rule on small entities, here defined as concerns employing fewer than 50 people. Because of data limitations, this small business analysis excluded generators of large quantities of First Third wastes. The small business population therefore included only two groups: All non-commercial treatment, storage and disposal facilities employing fewer than 50 persons, and all small quantity generators which were also small businesses.

According to EPA's guidelines for conducting Regulatory Flexibility Analysis, if over 20% of the population of small businesses is likely to experience financial distress based on the costs of a rule, then the Agency is required to consider that the rule will have a significant effect on a substantial number of small entities and to perform a formal Regulatory Flexibility Analysis. EPA has examined the rule's potential effects on small businesses as required by the Regulatory Flexibility Act and has concluded that today's final rule will not have a significant economic effect on a substantial number of small entities. As a result of this finding, EPA has not prepared a formal Regulatory Flexibility Analysis document in support of this rule. More detailed information on small business impacts is available

in technical background documents prepared in support of this rulemaking.

C. Paperwork Reduction Act

The information collection requirements in this proposed rule have been submitted for approval to the Office of Management and Budget (OMB) under the *Paperwork Reduction Act*, 44 U.S.C. 3501 *et seq.* An Information Collection Request document has been prepared by EPA (ICR No. 1436) and a copy may be obtained from Rick Westlund, Information Policy Branch; EPA; 401 M Street SW. (RM-223); Washington, DC 20460 or by calling (202) 382-2745. Submit comments on these requirements to EPA and: Office of Information and Regulatory Affairs; OMB; 726 Jackson Place NW.; Washington DC 20503 marked "Attention: Desk Officer for EPA." The final rule will respond to any OMB or public comments in the information collection requirements.

D. Review of Supporting Documents

The primary source of information on current land disposal practices and industries affected by this rule was EPA's "National Survey of Hazardous Waste Generators and Treatment, Storage and Disposal Facilities Regulated Under RCRA in 1981" (RIA Mail Survey) (April 1984). EPA's "National Small Quantity Hazardous Waste Generator Survey" (February 1985) was the major source of data on small quantity generators.

Waste stream characterization data and engineering costs of waste management were based on the following EPA documents:

- "Characterization of Waste Streams Listed in 40 CFR Section 261 Waste Profiles," Vols. I and II (August 1985);
- "Characterization of Constituents from Selected Waste Streams Listed in 40 CFR Section 261," Vols. I and II (August 1985);
- RCRA Background and Listing Documents for 40 CFR Section 261;
- RCRA Section 3007 Industry Studies;
- "RCRA Risk-Cost Analysis Model, Appendix A: Waste Stream Data Base" (March 1984); and
- Source Assessment Documents for various industries.

For financial and value of shipment information for the general screening analysis, 1982 Census data were used, adjusted by 1984 Annual Survey of Manufacturers data. Producer price indices were also used to restate 1984 dollars in 1987 terms.

VIII. Implementation of the Part 268 Land Disposal Restrictions Program

As a result of the regulations being proposed under Part 268, several options will be available to the generator or owner or operator of a treatment, storage, and disposal facility for the management of restricted hazardous wastes. This section helps the regulated community determine the appropriate waste management procedures. It provides references to the applicable 40 CFR Parts 264 and 265 requirements as well as Part 268 requirements for implementation of the various waste management options.

All the sequences in the generator's decision-making process must commence with a determination as to whether the hazardous waste is listed in Part 268 Subpart C. If the hazardous waste is not a restricted waste, it is not subject to the land disposal restrictions of Part 268. It must nevertheless be managed in accordance with Parts 264 and 265.

The generator of a restricted waste must determine the appropriate treatment standards (if any) under Part 268 Subpart D. The applicable treatment standards must be determined at the point of initial generation prior to any treatment. At this time, he must determine the effective date of the applicable treatment standard. EPA has the authority to delay the effective dates of the Part 268 treatment standards based on the unavailability of adequate national treatment capacity. Determinations as to the adequacy of treatment capacity are based on the quantity of waste generated and the availability of alternative treatment, recovery or disposal technologies. For those wastes where EPA has determined that alternative capacity is adequate, the treatment standards take effect immediately upon promulgation. The generator must use analysis of his waste (or waste extract, when applicable) or knowledge of his waste (data supporting such knowledge must be kept on-site) to make determinations as to whether his waste may go directly to land disposal or first must be treated.

If the concentrations of the hazardous constituents in the waste (or waste extract, when applicable) are in compliance with the applicable treatment standards, the waste may go directly to land disposal. The generator must submit a notice and certification statement to the land disposal facility as required under § 268.7. The land disposal facility must verify the records of the generator in accordance with the facility's waste analysis plan. A generator that operates an on-site land

disposal facility must put the information contained in the notice (except for the manifest number) in the operating record of the land disposal facility.

If the concentrations of the hazardous constituents in the waste (or waste extract, when applicable) exceeds the treatment standards, placement of the waste in land disposal units as of the effective date specified in Part 268 Subpart C is prohibited (unless the waste is subject to a case-by-case extension under § 268.5, or a "no migration" exemption under § 268.6). The generator must treat the prohibited waste in either an on-site or off-site treatment facility with interim status or a RCRA permit that is allowed to accept the waste.

An off-site treatment facility must obtain a notice from the generator as required in § 268.7. This notice must be placed in the operating record. Generators that are also treatment facilities must keep the information contained in the notice (except for the manifest number) in the facility's operating record.

When shipping the treatment residual to an interim status or RCRA permitted land disposal facility, the treatment facility must certify in accordance with § 268.7 that the treatment residue meets the applicable treatment standards and must also send a notice (§ 268.7) to the land disposal facility.

If the generator's waste is a restricted waste listed in § 268.10 (i.e., a First Third waste) where treatment standards have not been set, and such waste is land disposed off-site by methods other than landfills or surface impoundments, the generator must provide a notice in accordance with § 268.7. The off-site disposal facility is required to keep the generator's notice in its operating record, and is responsible for ensuring that the waste is not disposed in a landfill or surface impoundment. If the generator disposes on-site, the information contained in the notice (except for the manifest number) must be kept in the facility's operating record, and the generator must ensure that such waste is not disposed in a landfill or surface impoundment.

If the generator's waste is a restricted waste listed in § 268.10, where treatment standards have not been set, and are disposed in a landfill or surface impoundment, such waste may only be disposed in landfill or surface impoundment units that meet the minimum technological requirements of RCRA section 3004(o) (double liner, leachate collection system, and groundwater monitoring). Prior to

disposal, the generator must certify in accordance with § 268.8. For off-site disposal, the demonstration and certification required in § 268.8, as well as the notice required in § 268.7 must be provided with the initial waste shipment. The § 268.8 demonstration need not be provided again as long as the conditions of the demonstration have not changed. Thereafter, only the notice required in § 268.7 and the certification required in § 268.8, must be provided with each waste shipment. If such waste is disposed on-site, the demonstration and certification required in § 268.8, as well as the notice (except for the manifest number) required in § 268.7 must be kept in the operating record.

If the generator's waste is a restricted waste listed in § 268.10 where no treatment standard has been set, and the waste goes off-site for treatment, the generator must send a notice as required in § 268.7. The treatment facility must keep a copy of the notice in its operating record. If treated on-site, the information contained in the notice (except for the manifest number) must be kept in the facility's operating record. After treatment, and no further treatment is practically available (if further treatment is available, the recordkeeping requirements that apply are the same as for the original treatment), the requirements are the same that apply for the generator. If the waste is disposed in a landfill or surface impoundment (which must meet the minimum technological requirements, see section 3004(g)(6)(A)(i)), the original generator or the owner/operator may supply the demonstration and certification required by § 268.8. The generator may supply this information when the waste is sent to the treatment facility, certifying that no further treatment is practically available and therefore, placement in the landfill or surface impoundment is the only practical alternative.

IX. References

Background Documents

(1) U.S. EPA, "Background Document for First Third Wastes to Support 40 CFR Part 268 Land Disposal Restrictions Proposed Rule First-Third Waste Volume, Characteristics, and Required and Available Treatment Capacity," U.S. EPA, OSW, Washington, DC, 1987.

(2) U.S. EPA, "Best Demonstrated Available Technology (BDAT) Background Document for First Third Waste Codes," U.S. EPA, OSW, Washington, DC, 1987.

Regulatory Impact Analysis

(3) U.S. EPA, "Regulatory Impact Analysis of Proposed Restrictions on Land Disposal of First Third Wastes," U.S. EPA, OSW, Washington, DC, 1987.

List of Subjects in 40 CFR Parts 264, 265, 268, and 271

Administrative practice and procedure, Confidential business information, Environmental protection, Hazardous materials, Hazardous materials transportation, Hazardous waste, Imports, Indian lands, Insurance, Intergovernmental relations, Labeling, Packaging and container, Penalties, Recycling, Reporting and recordkeeping requirements, Security measures, Surety bonds, Surety measures, Waste treatment and disposal, Water pollution control, Water supply.

Dated: March 28, 1988.

Lee M. Thomas,
Administrator.

For reasons set out in the preamble, it is proposed that Chapter I of Title 40 be amended as follows:

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

I. In Part 264:

1. The authority citation for Part 264 is revised to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, and 6925.

Subpart B—General Facility Standards

2. Section 264.13 is amended by revising paragraph (b)(7)(iii) to read as follows:

§ 264.13 General waste analysis.

* * * * *

(b) * * *

(7) * * *

(iii) The annual removal of residues which are not delisted under § 260.22 of this chapter or which exhibit a characteristic of hazardous waste and either:

(A) Do not meet applicable treatment standards of Part 268 Subpart D; or

(B) Where no treatment standards have been established:

(1) Such residues do not meet the applicable prohibition levels in § 268.32 or RCRA section 3004(d); or

(2) Such residues are prohibited from land disposal under § 268.33(e).

* * * * *

Subpart E—Manifest System, Recordkeeping, and Reporting

3. Section 264.73 is amended by revising paragraphs (b)(10), (b)(13), and (b)(14) to read as follows:

§ 264.73 Operating record.

* * * * *

(b) * * *

(10) Records of the quantities (and date of placement) for each shipment of hazardous waste placed in land disposal units under an extension to the effective date of any land disposal restriction granted pursuant to § 268.5, a petition pursuant to § 268.6, or a certification under § 268.8, and the applicable notice required by a generator under § 268.7(a);

* * * * *

(13) For an off-site land disposal facility, a copy of the notice and certification (and demonstration, if applicable) required by the generator or the owner or operator of a treatment facility under §§ 268.7 and 268.8, whichever is applicable; and

(14) For an on-site land disposal facility, the information contained in the notice required by the generator or owner or operator of a treatment facility under § 268.7, except for the manifest number, and the certification (and demonstration, if applicable) required under § 268.8, whichever is applicable.

* * * * *

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

II. In Part 265:

The authority citation for Part 265 is revised to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6924, 6925, and 6935.

Subpart B—General Facility Standards

2. Section 265.13 is amended by revising paragraph (b)(7)(iii) to read as follows:

§ 265.13 General waste analysis.

* * * * *

(b) * * *

(7) * * *

(iii) The annual removal of residues which are not delisted under § 260.22 of this chapter or which exhibit a characteristic of hazardous waste and either:

(A) Do not meet applicable treatment standards of Part 268 Subpart D; or

(B) Where no treatment standards have been established:

(1) Such residues do not meet the applicable prohibition levels in § 268.32 or RCRA section 3004(d); or

(2) Such residues are prohibited from land disposal under § 268.33(e).

* * * * *

Subpart E—Manifest System, Recordkeeping, and Reporting

3. Section 265.73 is amended by revising paragraphs (b)(8), (b)(11), and (b)(12) to read as follows:

§ 265.73 Operating record.

(b) * * *

(8) Records of the quantities (and date of placement) for each shipment of hazardous waste placed in land disposal units under an extension to the effective date of any land disposal restriction granted pursuant to § 268.5, a petition pursuant to § 268.6, or a certification under § 268.8, and the applicable notice required by a generator under § 268.7(a);

(11) For an off-site land disposal facility, a copy of the notice and certification (and demonstration, if applicable) required by the generator or the owner or operator of a treatment facility under § 268.7 and § 268.8, whichever is applicable; and

(12) For an on-site land disposal facility, the information contained in the notice required by the generator or the owner or operator of a treatment facility under § 268.7, except for the manifest number, and the certification (and demonstration, if applicable) required under § 268.8, whichever is applicable.

PART 268—LAND DISPOSAL RESTRICTIONS**III. In Part 268:**

1. The authority citation for Part 268 is revised to read as follows:

Authority: 42 U.S.C. 6905, 6912(a), 6921, and 6924.

Subpart A—General

2. Section 268.1 is amended by adding paragraph (c)(6) to read as follows:

§ 268.1 Purpose, scope and applicability.

(c) * * *

(6) Prior to May 8, 1990, in a landfill or surface impoundment unit where all applicable persons are in compliance with the requirements of § 268.8, with respect to wastes that are not subject to Subpart D treatment standards and not subject to the prohibitions in § 268.32 or RCRA section 3004(d).

3. Section 268.4 is amended by revising paragraph (a)(2) to read as follows:

§ 268.4 Treatment surface impoundment exemption.

(a) * * *

(2) The following conditions are met:

(i) *Sampling and testing.* For wastes with treatment standards in Subpart D of this part and/or prohibition levels in Subpart C of this part or RCRA section 3004(d), the residues of the treatment are analyzed, as specified in § 268.7 or § 268.32, to determine if they meet the applicable treatment standards or, where no treatment standards have been established for the waste, the applicable prohibition levels. The sampling method, specified in the waste analysis plan under § 264.13 or § 265.13, must be designed such that representative samples of the sludge and the supernatant are tested separately rather than mixed to form homogeneous samples.

(ii) *Removal.* The following treatment residues (including any liquid waste) must be removed at least annually: residues which do not meet the treatment standards promulgated under Subpart D of this part; residues which do not meet the prohibition levels established under Subpart C of this part or imposed by statute (where no treatment standards have been established); residues which are from the treatment of wastes prohibited from land disposal under Subpart C of this part (where no treatment standards have been established and no prohibition levels apply); or residues from managing listed wastes which are not delisted under § 260.22 of this chapter. However, residues which are the subject of a valid certification under § 268.8 made no later than a year after placement of the wastes in an impoundment are not required to be removed annually. If the volume of liquid flowing through the impoundment or series of impoundments annually is greater than the volume of the impoundment or impoundments, this flow-through constitutes removal of the supernatant for the purpose of this requirement.

(iii) *Subsequent management.* Treatment residues may not be placed in any other surface impoundment for subsequent management unless the residues are the subject of a valid certification under § 268.8 which allows disposal in surface impoundments meeting the requirements of § 268.8(a).

(iv) *Recordkeeping.* The procedures and schedule for the sampling of impoundment contents, the analysis of test data, and the annual removal of residues which do not meet the treatment standards, or prohibition levels (where no treatment standards have been established), or which are from the treatment of wastes prohibited from land disposal under Subpart C (where no treatment standards have been established and no prohibition

levels apply), must be specified in the facility's waste analysis plan as required under § 264.13 or § 265.13 of this chapter.

4. Section 268.5 is amended by revising paragraph (h)(2) introductory text to read as follows:

§ 268.5 Procedures for case-by-case extensions to an effective date.

(h) * * *

(2) Such hazardous waste may be disposed of in a landfill or surface impoundment unit only if the unit is in compliance with the following requirements:

5. Section 268.6 is amended by revising paragraph (a)(3) and adding new paragraphs (a)(4) and (a)(5), and revising paragraphs (c), (e) and (f) to read as follows:

§ 268.6 Petitions to allow land disposal of a waste prohibited under Subpart C of Part 268.

(a) * * *

(3) A comprehensive characterization of the disposal unit site including an analysis of background air, soil, and water quality.

(4) A monitoring plan which will detect migration at the earliest practicable time;

(5) Sufficient information to assure the Administrator that land disposal of the restricted waste(s) will comply with other applicable Federal, State, and local laws.

(c) Each petition referred to in paragraph (a) of this section must include the following:

(1) A monitoring plan that describes the monitoring program installed at and/or around the unit to verify continued compliance with the conditions of the variance. This monitoring plan must provide information on the monitoring of the unit and/or the environment around the unit, or if monitoring the unit or environment around the unit is technically infeasible or impractical, the rationale supporting the determination of infeasibility or impracticality. The following specific information must be included in the plan:

(i) The media monitored in the cases where monitoring of the environment around the unit is required;

(ii) The type of monitoring conducted at the unit, in the cases where monitoring of the unit is required;

(iii) The location of the monitoring stations;

(iv) The monitoring interval (frequency of monitoring at each station);

(v) The specific hazardous constituents to be monitored;

(vi) The implementation schedule for the monitoring program;

(vii) The equipment used at the monitoring stations;

(viii) The sampling and analytical techniques employed; and

(ix) The data recording/reporting procedures.

(2) Where applicable, the monitoring program described in paragraph (c)(1) must be in place for a period of time specified by the Administrator prior to receipt of restricted waste at the unit, unless an alternate schedule is approved by the Administrator.

(3) The monitoring data collected according to the monitoring plan specified under paragraph (c)(1) of this section must be sent to the Administrator according to a format and schedule specified and approved in the monitoring plan, and

(4) A copy of the monitoring data collected under the monitoring plan specified under paragraph (c)(1) of this section must be kept on-site at the facility in the operating record.

(5) The monitoring program specified under paragraph (c)(1) of this section meet the following criteria:

(i) All sampling, testing, and analytical data must be approved by the Administrator and must provide data that is accurate and reproducible.

(ii) All estimation and modeling techniques must be approved by the Administrator.

(iii) A quality assurance and quality control plan addressing all aspects of the monitoring program must be provided to and approved by the Administrator.

(e) After a petition has been approved, the owner or operator must report any changes in conditions at the unit and/or the environment around the unit that may affect requirements upon which the petition was approved.

(1) If the owner or operator desires to make changes to the unit such as the engineering design, or the compliance monitoring system such a change must be proposed, in writing, and the owner or operator must submit a demonstration to the Administrator at least 30 days prior to making the change. The Administrator will determine whether the proposed change invalidates the terms of the petition and will determine the appropriate response. Any change must be approved by the Administrator prior to being made.

(2) If the owner or operator discovers that a condition at the site which was modeled or predicted in the petition does not occur as predicted, this change must be reported, in writing, to the Administrator within 10 days of discovering the change. The Administrator will determine whether the reported change from the terms of the petition requires further action, which may include revocation of the petition, petition modifications, or other responses.

(f) If the owner or operator determines that there is migration of hazardous constituent(s) from the unit, the owner or operator must:

(1) Immediately suspend receipt of restricted wastes at the unit, and

(2) Notify the Administrator, in writing, within 10 days of the determination that a release has occurred.

(3) Following receipt of the notification the Administrator will determine within 60 days of receiving notification the appropriate response actions that the owner or operator must take to prevent further migration of hazardous constituents out of the unit.

6. Section 268.7 is amended by revising the introductory texts of paragraphs (a)(1) and (a)(2), and by revising (a)(3), by redesignating paragraph (a)(4) as (a)(5), by adding the new paragraph (a)(4), by revising paragraph (b) introductory text, by redesignating paragraph (b)(1) as (b)(4) and (b)(2) as (b)(5), by adding new paragraphs (b)(1), (b)(2), (b)(3), (b)(6), and (b)(7), and by revising paragraph (c) to read as follows:

§ 268.7 Waste analysis.

(a) Except as specified in § 268.32 or § 268.43 of this part, the generator must test his waste, or test an extract developed using the test method described in Appendix I of this part, or use knowledge of the waste, to determine if the waste is restricted from land disposal under this part.

(1) If a generator determines that he is managing a restricted waste under this part and the waste does not meet the applicable treatment standards, or where the waste does not comply with the applicable prohibitions set forth in § 268.32 of this part or RCRA section 3004(d), with each shipment of waste the generator must notify the treatment or storage facility in writing of the appropriate treatment standards set forth in Subpart D of this part and any applicable prohibitions set forth in § 268.32 of this part or RCRA section

3004(d). The notice must include the following information:

(2) If a generator determines that he is managing a restricted waste under this part, and determines that the waste can be land disposed without further treatment, with each shipment of waste he must submit, to the treatment, storage, or land disposal facility, a notice and a certification stating that the waste meets the applicable treatment standards set forth in Subpart D of this part and the applicable prohibitions set forth in § 268.32 of this part of RCRA section 3004(d).

(3) If a generator's waste is subject to a case-by-case extension under § 268.5, an exemption under § 268.6, an extension under § 268.1(c)(3), or a nationwide variance under Subpart C, with each shipment of waste, he must submit a notice to the facility receiving his waste stating that the waste is not prohibited from land disposal.

(4) If a generator determines that he is managing a waste that is subject to the prohibitions under § 268.33(e) of this part and is not subject to the prohibitions set forth in § 268.32 of this part, with each shipment of waste the generator must notify the treatment, storage, or disposal facility, in writing, of any applicable prohibitions set forth in § 268.33(e). The notice must include the following information:

(i) EPA Hazardous Waste Number;

(ii) The applicable prohibitions set forth in § 268.33(e);

(iii) The manifest number associated with the shipment of waste; and

(iv) Waste analysis data where available.

(b) Treatment facilities must test their wastes according to the frequency specified in their waste analysis plans as required by § 264.13 or § 265.13. Such testing must be performed as provided in paragraphs (b)(1), (b)(2) and (b)(3) of this section.

(1) For wastes with treatment standards expressed as concentrations in the waste extract (§ 268.41), the owner or operator of the treatment facility must test the treatment residues, or an extract of such residues developed using the test method described in Appendix I of this part, to assure that the treatment residues or extract meet the applicable treatment standards.

(2) For wastes that are prohibited under § 268.32 of this part or RCRA section 3004(d) but not subject to any treatment standards under Subpart D of this part, the owner or operator of the

treatment facility must test the treatment residues according to the generator testing requirements specified in § 268.32 to assure that the treatment residues comply with the applicable prohibitions.

(3) For wastes with treatment standards expressed as concentrations in the waste (§ 268.43), the owner or operator of the treatment facility must test the treatment residues (not an extract of such residues) to assure that the treatment residues meet the applicable treatment standards.

* * * * *

(6) If the waste or treatment residue will be further managed at a different treatment or storage facility, the treatment, storage or disposal facility sending the waste or treatment residue off-site must comply with the notice requirements applicable to generators in paragraph (a)(1) of this section.

(7) For wastes that are subject to the prohibitions under § 268.33(e) of this part and are not subject to the prohibitions set forth in § 268.32 of this part, with each shipment of such waste the owner or operator must notify any subsequent treatment, storage, or disposal facility, in writing, of any applicable prohibitions set forth in § 268.33(e). The notice must include the following information:

- (i) EPA Hazardous Waste Number;
- (ii) The applicable prohibitions set forth in § 268.33(e);
- (iii) The manifest number associated with the shipment of waste; and
- (iv) Waste analysis data, where available.

(c) The owner or operator of any land disposal facility disposing any waste subject to restrictions under this part must:

(1) Have records of the notice and certifications specified in paragraph (a) or (b) of this section, and the certification specified in § 268.8 if applicable.

(2) Test the waste, or an extract of the waste or treatment residue developed using the test method described in Appendix I of this part or using any methods required by generators under § 268.32 of this part, to assure that the wastes or treatment residues are in compliance with the applicable treatment standards set forth in Subpart D of this part and all applicable prohibitions set forth in § 268.32 of this part or in RCRA section 3004(d). Such testing must be performed according to the frequency specified in the facility's waste analysis plan as required by § 264.13 or § 265.13.

(3) Where the owner or operator is disposing of any waste that is subject to

the prohibitions under § 268.33(e) of this part but not subject to the prohibitions set forth in § 268.32, he must ensure that such waste is the subject of a valid certification according to the requirements of § 268.8 prior to disposal in a landfill or surface impoundment unit, and that such disposal is in accordance with the requirements of § 268.5(h)(2).

7. Section 268.8 is added to read as follows:

§ 268.8 Landfill and surface impoundment disposal restrictions.

(a) Prior to May 8, 1990, wastes which are otherwise prohibited from land disposal under § 268.33(e) of this part may be disposed in a landfill or surface impoundment which is in compliance with the requirements of § 268.5(h)(2) provided that the requirements of this section are met.

(1) Prior to such disposal, the person seeking to dispose such wastes (i.e., the generator or owner or operator) has made a good faith effort to locate and contract with treatment and recovery facilities currently available.

(2) Such generator or owner or operator submits to the Regional Administrator a demonstration and certification that the requirements of paragraph (a)(1) of this section have been met. The demonstration must include a list of facilities and facility officials contacted, addresses, telephone numbers, contact dates, and an explanation of why no treatment is practically available. The following certification is required.

I certify under penalty of law that the requirements of 40 CFR 268.8(a)(1) have been met and that disposal in a landfill or surface impoundment is the only practical alternative to treatment currently available. I believe that the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false informations, including the possibility of fine and imprisonment.

(3) With the initial shipment of waste, such generator or owner or operator must submit a copy of the demonstration and the certification required in paragraph (a)(2) of this section to the land disposal facility. For each subsequent waste shipment, only the certification is required to be submitted provided that the conditions being certified remain unchanged. Such generator or owner or operator must keep copies of the demonstration (if applicable) and certification required for each waste shipment on-site.

(b) After receiving the demonstration and certification, the Regional Administrator may request any

additional information which he deems necessary to evaluate the certification.

(1) Any person who has submitted a certification under this section must immediately notify the Regional Administrator when he has knowledge of any change in the conditions which formed the basis of his certification.

(2) If, after review of the certification, the Regional Administrator determines that treatment (or further treatment) that yields reductions in toxicity is practically and currently available, or that some other method of treatment yields greater reductions in toxicity of the waste or residual or greater reductions in the likelihood of migration of hazardous constituents from the waste or residual, the Regional Administrator may invalidate the certification and require such additional treatment.

(c) Once the certification is made, wastes may be disposed in a landfill or surface impoundment unless otherwise prohibited by the Regional Administrator.

Subpart C—Prohibition on Land Disposal

8. Section 268.33 is added to read as follows:

§ 268.33 Waste specific prohibitions—First Third wastes.

(a) Effective August 8, 1988, the wastes specified in 40 CFR 261.32 as EPA Hazardous Waste Nos. K004, K008, K015, K036, K062, K069, K073, and K100 are prohibited from land disposal.

(b) Effective August 8, 1990, the wastes specified in 40 CFR 261.32 as EPA Hazardous Waste Nos. K016, K018, K019, K020, K024, K030, K037, K048, K049, K050, K051, K052, K061, K071, K103, and K014 are prohibited from land disposal.

(c) Between August 8, 1988, and May 8, 1990, for wastes described in paragraph (b) of this section, disposal in a landfill or surface impoundment is allowed only if the unit is in compliance with the requirements specified in § 268.5(h)(2).

(d) The requirements of paragraph (a), (b), and (c) of this section do not apply if:

(1) The wastes meet the applicable standards specified in Subpart D of this part; or

(2) Persons have been granted an exemption from a prohibition pursuant to a petition under § 268.6, with respect to those wastes and units covered by the petition; or

(3) Persons have been granted an extension to the effective date of a prohibition pursuant to § 268.5, with

respect to those wastes covered by the extension.

(e) Between August 8, 1988, and May 8, 1990, the wastes specified in § 268.10 for which treatment standards under Subpart D of this part or prohibitions in § 268.32 or in RCRA section 3004(d) are not applicable are prohibited from disposal in a landfill or, surface impoundment unless the wastes are the subject of a valid demonstration and certification pursuant to § 268.8.

(f) To determine whether a hazardous waste listed in § 268.10 exceeds the applicable treatment standards specified in § 268.43, the initial generator must test a representative sample of the entire waste (not a leach extract). If the waste contains constituents in excess of the applicable Subpart D levels, the waste is prohibited from land disposal and all requirements of Part 268 are applicable, except as otherwise specified in this section.

Subpart D—Treatment Standards

9. Section 268.40 is amended by revising paragraph (a) and adding a new paragraph (c) to read as follows:

§ 268.40 Applicability of treatment standards.

(a) A restricted waste identified in § 268.41 may be land disposed only if an extract of the waste or of the treatment residue of the waste developed using the test method in Appendix I of this part does not exceed the value shown in Table CCWE of § 268.41 for any hazardous constituent listed in Table CCWE for that waste.

(c) A restricted waste identified in § 268.43 may be land disposed only if the constituent concentrations in the waste or treatment residue of the waste do not exceed the value shown in Table CCWE of § 268.43 for any hazardous constituent listed in Table CCWE for that waste.

10. Section 268.41(a) is amended by adding the following subtables to Table CCWE in alphabetical and numerical order by EPA Hazardous Waste Number:

§ 268.41 Treatment standards expressed as concentrations in waste extract.

(a) * * *

Table CCWE—Constituent Concentrations in Waste Extract

* * * * *

K061 nonwastewater (see also table CCW in § 268.43)	Concentration (in mg/l)
Cadmium.....	0.19
Chromium (total).....	0.33
Lead.....	0.09
Mercury.....	0.02
Zinc.....	0.50

K062 nonwastewater (see also table CCW in § 268.43)	Concentration (in mg/l)
Chromium (total).....	0.094
Lead.....	0.37

K071 nonwastewater (see also table CCW in § 268.43)	Concentration (in mg/l)
Mercury.....	0.0025

K048, K049, K050, K051, K052 nonwastewater (see also table CCW in § 268.43)	Concentration (in mg/l)
Arsenic.....	0.006
Chromium (total).....	1.68
Copper.....	0.013
Nickel.....	0.048
Selenium.....	0.025
Vanadium.....	0.18
Zinc.....	0.141

* * * * *

11. Section 268.43 is amended by adding paragraphs (a) and (b) and Table CCW to read as follows:

§ 268.43 Treatment standards expressed as waste concentrations.

(a) Table CCW identifies the restricted wastes and the concentrations of their associated hazardous constituents which may not be exceeded by the waste or treatment residual (not an extract of such waste or residual) for the allowable land disposal of such waste or residual.

TABLE CCW—CONSTITUENT CONCENTRATIONS IN WASTES

K061 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Cadmium.....	44.0
Chromium.....	1730.0
Lead.....	20,300.0
Mercury.....	0.28
Zinc.....	24,100.0

K062 wastewater (see also table CCWE in § 268.41)	Concentration (in mg/l)
Chromium (total).....	0.32
Copper.....	0.42
Nickel.....	0.44

K062 wastewater (see also table CCWE in § 268.41)	Concentration (in mg/l)
Lead.....	0.04

K016 nonwastewater	Concentration (in mg/kg)
Tetrachloroethene.....	5.96
Hexachlorobenzene.....	27.2
Hexachlorobutadiene.....	5.44
Hexachlorocyclopentadiene.....	5.44
Hexachloroethane.....	27.2

K016 nonwastewater	Concentration (in mg/l)
Tetrachloroethene.....	0.007
Hexachlorobenzene.....	0.033
Hexachlorobutadiene.....	0.007
Hexachlorocyclopentadiene.....	0.007
Hexachloroethane.....	0.033

K018 nonwastewater	Concentration (in mg/kg)
Chloroethane.....	5.96
1,1-Dichloroethane.....	5.96
1,2-Dichloroethane.....	5.96
1,1,1-Trichloroethane.....	5.96
Hexachlorobenzene.....	27.2
Hexachloroethane.....	27.2
Hexachlorobutadiene.....	5.44
Pentachloroethane.....	5.44

K018 nonwastewater	Concentration (in mg/l)
Chloroethane.....	0.007
Chloromethane.....	0.007
1,1-Dichloroethane.....	0.007
1,2-Dichloroethane.....	0.007
1,1,1-Trichloroethane.....	0.007
Hexachlorobenzene.....	0.033
Hexachlorobutadiene.....	0.007
Pentachloroethane.....	0.007

K019 nonwastewater	Concentration (in mg/kg)
Chloroform.....	5.96
1,2-Dichloroethane.....	5.96
Tetrachloroethene.....	5.96
1,1,1-Trichloroethane.....	5.96
Bis(2-chloroethyl)ether.....	5.44
Chlorobenzene.....	5.66
Hexachloroethane.....	27.2
Naphthalene.....	5.44
Phenanthrene.....	5.44
1,2,4-Trichlorobenzene.....	18.7

K019 wastewater	Concentration (in mg/l)
Chlorobenzene.....	0.006
Chloroform.....	0.007
1,2-Dichloroethane.....	0.007

K019 wastewater	Concentration (in mg/l)
Tetrachloroethene	0.007
1,1,1-Trichloroethane	0.007
Bis(2-chloroethyl)ether	0.007
p-Dichlorobenzene	0.008
Hexachloroethane	0.033
Naphthalene	0.007
1,2,4,5-Tetrachlorobenzene	0.017
1,2,4-Trichlorobenzene	0.023
Fluorene	0.007
Phenanthrene	0.007

K020 nonwastewater	Concentration (in mg/kg)
1,2-Dichloroethane	5.96
1,1,2,2-Tetrachloroethane	5.44
Tetrachloroethene	5.96

K020 wastewater	Concentration (in mg/l)
1,2-Dichloroethane	0.007
1,1,2,2-Tetrachloroethane	0.007
Tetrachloroethene	0.007

K030 nonwastewater	Concentration (in mg/kg)
Hexachlorobutadiene	5.44
Hexachloroethane	27.2
Hexachloropropene	18.7
Pentachlorobenzene	27.2
Pentachloroethane	5.44
1,2,4,5-Tetrachlorobenzene	13.6
Tetrachloroethene	5.96
1,2,4-Trichlorobenzene	18.7

K030 wastewater	Concentration (in mg/l)
Tetrachloroethene	0.007
Hexachlorobutadiene	0.007
Hexachloroethane	0.007
Pentachloroethane	0.007
1,2,4,5-Tetrachlorobenzene	0.017
1,2,4-Trichlorobenzene	0.023
o-Dichlorobenzene	0.008
p-Dichlorobenzene	0.008

K024 nonwastewater	Concentration (in mg/kg)
Phthalic acid	6.0

K024 wastewater	Concentration (in mg/l)
Phthalic acid	0.08

K103 and K104 nonwastewater	Concentration (in mg/kg)
Aniline	27.2
Benzene	5.96
2,3-Dinitrophenol	5.44
Nitrobenzene	18.7
Phenol	27.2
Total Cyanides (for K104 only)	1.48

K103 and K104 wastewater	Concentration (in mg/l)
Aniline	4.450
Benzene	0.147
2,3-Dinitrophenol	0.613
Nitrobenzene	0.073
Phenol	1.391
Total Cyanides (for K104 only)	2.683

K071 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Mercury	4.6

K071 wastewater	Concentration (in mg/l)
Mercury	0.030

K048 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Bis(2-ethylhexyl)phthalate	4.18
Toluene	3.93
Chrysene	0.84
Xylene	8.54
Di-n-butyl phthalate	4.18
Naphthalene	0.84
Phenanthrene	0.84
Phenol	0.84
Cyanide	1.48

K048 wastewater	Concentration (in mg/l)
Phenol	0.007
Fluorene	0.007
Toluene	0.007
Xylene	0.007
Naphthalene	0.007
Phenanthrene	0.007
Chromium (total)	0.20
Lead	0.037
Zinc	0.40

K049 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Chrysene	0.84
Xylene	8.54
Benzene	3.93
Toluene	3.93

K049 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Naphthalene	0.84
Phenanthrene	0.84
Phenol	0.84
Pyrene	1.06
Cyanide	1.48

K049 wastewater	Concentration (in mg/l)
Anthracene	0.007
Xylene	0.007
2,4-Dimethylphenol	0.007
Benzene	0.023
Toluene	0.007
Naphthalene	0.007
Phenanthrene	0.007
Phenol	0.007
Chromium (total)	0.20
Lead	0.037
Zinc	0.40

K050 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Benzo(a)pyrene	0.84
Phenol	0.84
Cyanide	1.48

K050 wastewater	Concentration (in mg/l)
Phenol	0.007
Chromium (total)	0.20
Lead	0.037
Zinc	0.40

K051 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Toluene	3.93
Chrysene	0.84
Xylene	8.54
Di-n-butyl phthalate	4.18
Naphthalene	0.84
Phenanthrene	0.84
Phenol	0.84
Pyrene	1.06
Cyanide	1.48

K051 wastewater	Concentration (in mg/l)
Fluorene	0.007
Acenaphthene	0.007
Toluene	0.007
Xylene	0.007
Naphthalene	0.007
Phenanthrene	0.007
Phenol	0.007
Chromium (total)	0.20
Lead	0.037
Zinc	0.40

K052 nonwastewater (see also table CCWE in § 268.41)	Concentration (in mg/kg)
Toluene.....	3.93
Xylene.....	8.54
o-Cresol.....	0.84
p-Cresol.....	0.84
Naphthalene.....	0.84
Phenanthrene.....	0.84
Phenol.....	0.84
Cyanide.....	1.48

K052 wastewater	Concentration (in mg/l)
Phenanthrene.....	0.007
2,4-Dimethylphenol.....	0.007
Benzene.....	0.023
Xylene.....	0.007
o-Cresol.....	0.007
p-Cresol.....	0.007
Naphthalene.....	0.007
Phenol.....	0.007
Chromium (total).....	0.20
Lead.....	0.037
Zinc.....	0.40

K015 wastewater	Concentration (in mg/l)
Anthracene.....	1.02
Benzal chloride.....	0.28
Benzo(b and/or k) fluoranthene.....	0.29
Phenanthrene.....	0.27
Toluene.....	1.00
Chromium (total).....	0.30
Nickel.....	0.44

K037 nonwastewater	Concentration (in mg/kg)
Disulfoton.....	0.1
Toluene.....	28.0

K037 wastewater	Concentration (in mg/l)
Disulfoton.....	0.003
Toluene.....	0.028

No Land Disposal for:

K004
K008
K015 nonwastewater
K036
K061 wastewater
K069
K073
K100

(b) When wastes with differing treatment standards for a constituent of concern are combined for purposes of treatment, the treatment residue must meet the lowest treatment standard for the constituent of concern.

Subpart E—Prohibitions on Storage

12. Section 268.50 is amended by revising paragraph (d) to read as follows:

§ 268.50 Prohibitions on storage of restricted wastes.

* * * * *

(d) The prohibition in paragraph (a) of this section does not apply to wastes which are the subject of an approved petition under § 268.6, a nationwide variance under Subpart C of this part, an approved case-by-case extension under § 268.5, or a valid certification under § 268.8.

* * * * *

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

IV. In Part 271:

1. The authority citation for Part 271 is revised to read as follows:

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

Subpart A—Requirements for Final Authorization

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

§ 271.1 Purpose and scope.

* * * * *

(j) * * *

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

Promulgation date	Title of regulation	FEDERAL REGISTER reference	Effective date
[Insert date of publication of final rule in the FEDERAL REGISTER].	Land disposal restrictions for First Third wastes.....	53 FR [insert FEDERAL REGISTER page numbers].....	Aug. 8, 1988.

3. Section 271.1(j) is amended by adding the date of publication and the

Federal Register page numbers to the following entry in Table 2.

§ 271.1 Purpose and scope.

* * * * *

(j) * * *

TABLE 2.—SELF-IMPLEMENTING PROVISIONS OF THE HAZARDOUS AND SOLID WASTE AMENDMENTS OF 1984

Effective date	Self-implementing provision	RCRA citation	FEDERAL REGISTER reference
Aug. 8, 1988.....	Land disposal restrictions on First Third of listed wastes.	3004(g).....	[Insert date of publication], 53 FR [insert FEDERAL REGISTER page numbers].

[FR Doc. 88-7379 Filed 4-7-88; 8:45 am]

BILLING CODE 6560-50-M