ENVIRONMENTAL PROTECTION AGENCY

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

[FRL-3614-3]

Hazardous Waste Treatment, Storage, and Disposal Facilities—Organic Air Emission Standards for Process Vents and Equipment Leaks

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The EPA is today promulgating standards that limit organic air emissions as a class at hazardous waste treatment, storage, and disposal facilities (TSDF) requiring a permit under subtitle C of the Resource Conservation and Recovery Act (RCRA). Today's action is the first part of a multiphased regulatory effort to control air emissions at new and existing hazardous waste TSDF. The rule establishes final standards limiting organic emissions from (1) process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that manage hazardous wastes with 10 parts per million by weight (ppmw) or greater total organics concentration, and (2) leaks from equipment that contains or contacts hazardous waste streams with 10 percent by weight or greater total organics. These standards were proposed in the **Federal Register** on February 5, 1987 (52 FR 3748).

The final standards are promulgated under the authority of section 3004 of the Hazardous and Solid Waste Amendments (HSWA) to the RCRA. The EPA is required by section 3004(n) of RCRA to promulgate standards for the monitoring and control of air emissions from hazardous waste TSDF as necessary to protect human health and the environment. The EPA plans to promulgate additional standards under this section in two further phases. Phase II will consist of air standards for organic emissions from surface impoundments, tanks, containers, and miscellaneous units. These standards are scheduled for proposal later this year. In Phase III, the residual risk from the first two phases will be assessed and, if necessary, EPA will develop further regulations or guidance to protect human health and the environment from the effects of TSDF air emissions.

EFFECTIVE DATE: This final rule is effective on December 21, 1990. The incorporation by reference of certain publications listed in the regulations is approved by the Director of the Federal Register as of September 5 and October 11, 1989.

ADDRESSES: The official record for this final rulemaking is contained in Docket No. F-90-AESF-FFFFF. This docket and the proposal docket (Docket No. F-86-AESP-FFFFF) are available for public inspection at the EPA RCRA Docket Office (OS-300) in room 2427M of the U.S Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. Additional information concerning the development of the equipment leak standards is contained in Docket No. A-79-27, which is available for public inspection at EPA's Central Docket Section, room 2903B, Waterside Mall, 401 M Street SW., Washington, DC 20460. For further information, see the discussion of supporting documentation for the rules under section X of this preamble.

Background information document: The background information document (BID) for the final standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone (919) 541-2777. Please refer to "Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)—Background Information for Promulgated Organic Emission Standards for Process Vents and Equipment Leaks" (EPA-450/3-89-009). The EPA has prepared a technical guidance document to aid in implementation of these rules. This document may also be obtained from the U.S. EPA Library (see above address). Please refer to "Hazardous Waste TSDF—Technical Guidance Document for RCRA Air Emission Standards for Process Vents and Equipment Leaks" (EPA-450/3-89-21).

FOR FURTHER INFORMATION CONTACT: The RCRA Hotline, toll-free at (800) 424-9346. For further information on regulatory aspects of these standards, contact Rick Colyer, Standards Development Branch, Emission Standards Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone number (919) 541-5262. For further information on the technical aspects of these standards, contact Robert Lucas, Chemicals and Petroleum Branch, telephone number (919) 541-0884, at the same address. For further information on test methods associated with these standards, contact Terry Harrison, Emission Measurement Branch, telephone number (919) 541-5233, at the same address as above.

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

I. Authority

These regulations are promulgated under the authority of sections 1006, 2002, 3001-3007, 3010, 3014, and 7004 of the Solid Waste Disposal Act of 1970, as amended by RCRA, as amended (42 U.S.C. 6905, 6912, 6921-6927, 6930, 6934, and 6974).

II. Summary of Final Standards

The standards limit emissions of organics from certain process vents and equipment leaks at new and existing hazardous waste TSDF requiring a permit under RCRA subtitle C (i.e., permitted TSDF and TSDF that need authorization to operate under RCRA section 3005(e)). This applicability includes all hazardous waste management units that require RCRA permits and recycling units that are not subject to RCRA permit requirements, if, independent of today's final rules, a RCRA permit is needed for another part of the facility operations.

A. Vents on Hazardous Waste Management Process Units

Today's final standards are applicable to vents on waste management units that manage hazardous waste with an annual average total organics concentration of 10 ppmw or greater (hereafter referred to as "process vents") and specifically include (1) process vents on distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations and vents on condensers serving these operations; and (2) process vents on tanks (e.g., distillate receivers, bottoms receivers, surge control tanks, separator tanks, and hot wells) associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping processes if emissions from these process operations are vented through the tanks. Up-to-date information and data used to determine whether or not a hazardous waste management unit and its associated process vent(s) are subject to the subpart AA standards must be maintained in the facility operating record (§ 264.1035(f) and § 265.1035(f)). For example, documentation of a waste analysis showing that the waste managed in the unit is less than the 10-ppmw applicability criterion must be kept in the facility operating record.

The final rules for process vents require that owners or operators of TSDF subject to the provisions of new subpart AA: (1) Reduce total organic emissions from all affected process vents at the facility to below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr), or (2) install and operate a control device(s) that reduces total organic emissions from all affected process vents at the facility by 95 weight percent. The owner or operator of the facility must determine through test data or engineering judgment and calculations that the facility is not expected to exceed the emission rate limit of 1.4 kg/h and 2.8 Mg/yr. Facilities with organic emissions from affected vents that never exceed the emission rate limit will not be required to install controls or monitor process vent emissions under this rule. For all other affected facilities, the owner or operator must install controls to reduce total facility process vent emissions from all affected vents below the emission rate limit or to reduce total facility process vent organic emissions after primary recovery by 95 percent; if enclosed combustion devices are used, the owner/operator has the option of reducing the organic concentration of each affected vent stream at the facility to no more than 20 parts per million bv volume (ppmv). Selection of the emission rate limit is addressed further in section VI.B below and in chapters 4.0 and 7.0 of the BID.

The final standards for process vents do not require the use of any specific types of equipment or add-on control devices. Condensers, carbon adsorbers, incinerators, and flares are demonstrated emission control equipment for the regulated processes, although the choice of control is not limited to these.

To demonstrate compliance with the process vent provisions, TSDF owners/operators must document process vent emissions and emission reductions achieved by add-on control devices and certify the emission reduction capability of the control equipment. Documentation must (1) identify affected process vents, provide the throughput and operating hours of each affected unit, and provide emission rate determinations for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility); and (2) show whether installed add-on control devices achieve the emission rate limit by design and during operation. Where the emission rate limit is not attained, documentation must show whether the add-on control devices achieve a 95-percent reduction in organics or the 20-ppmv organics concentration limit by design and during operation. The documentation must include the basis for determining the design emission reduction.

The rules for process vents require that specific control device operating parameters be monitored continuously and the monitoring information be recorded in the facility operating record to ensure that the devices perform according to their design and are properly operated and maintained. For facilities with final RCRA permits, periods when monitoring indicates that control device operating parameters exceed established tolerances for design specifications must be reported semiannually. The records and reports must include dates, duration, cause, and corrective measures taken. There are no reporting requirements for interim status facilities. These monitoring and recordkeeping requirements are discussed below in section V.B and in the BID in chapter 11.0, section 11.4.

B. Equipment Leaks on Hazardous Waste Management Process Units

The equipment leak standards apply to emissions from valves, pumps, compressors, pressure relief devices, sampling connection systems, and open-ended valves or lines. Under the final standards, controls for these sources are required at TSDF where the equipment contains or contacts hazardous waste streams with organic concentrations of 10 percent by weight or greater. The owner or operator of a facility may choose any of the applicable test methods identified in the final rules for determining the organic content.

To comply with the equipment leak standards, the facility owner/operator must identify all affected equipment (i.e., pumps, valves, compressors, etc., that contain or contact hazardous waste streams with at least 10-percent-by-weight organics), establish which of the affected equipment is in heavy liquid service, and determine which valves are unsafe or difficult to monitor. By the effective date of this regulation, the facility owner/operator must conduct the initial monthly monitoring survey of pumps and valves in gas/vapor or light liquid service. A number of portable volatile organic monitoring devices are capable of detecting equipment leaks. Any analyzer can be used, provided it meets the specifications and performance criteria set forth in EPA Reference Method 21 (contained in appendix A of 40 CFR part 60).

Affected compressors must have a dual mechanical seal system that includes a barrier fluid system or must be designated as having "no detectable emissions," which means an instrument reading of less than 500 ppm above background using EPA Reference Method 21. Sampling connections must have a closed-purge system. Open-ended valves or lines must have a cap, blind flange, plug, or second valve. Pressure relief devices must operate with "no detectable emissions."

Recordkeeping and monitoring are also required by the equipment leak provisions. For example, leaking equipment as determined by Method 21 must be tagged as specified in the rule, and records of repair attempts, delay of repair, etc., must be recorded in a log and included as part of the facility's operating record. Monitoring of control device operating parameters is also required if a closed-vent system and control device are installed as a result of the equipment leak standards. The standards and recordkeeping requirements are discussed below at section V.C.

III. Background

A. Regulatory Authority

In 1984, Congress passed HSWA, amending RCRA. Section 3004(n) of RCRA, as amended by HSWA, directs EPA to "* * * promulgate such regulations for the monitoring and control of air emissions at hazardous waste treatment, storage, and disposal facilities, including but not limited to open tanks, surface impoundments, and landfills, as may be necessary to protect human health and the environment." The standards being promulgated today address, in part, this congressional directive and are applicable to all TSDF that require authorization to operate under section 3005 of RCRA. These regulations are being promulgated under the authority of sections 1006, 2002, 3001–3007, 3010, 3014, and 7004 of the Solid Waste Disposal Act of 1970, as amended by RCRA, as amended (42 U.S.C. 6905, 6912, 6921–6927, 6930, 6934, and 6974).

B. Regulatory Scope of Today's Standards

Today's final rules apply to facilities that treat, store, or dispose of hazardous wastes as defined in 40 CFR 261.3 and, specifically, to certain hazardous waste management units at facilities requiring RCRA subtitle C permits. This includes facilities with permits and those operating under interim status. Today's rules, codified in new subparts AA and BB of 40 CFR parts 264 and 265, are applicable to the following units at TSDF: (1) Hazardous waste management units subject to the permitting requirements of part 270 (i.e., not 90-day accumulation tanks at TSDF), and (2) hazardous waste recycling units located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270. Under 40 CFR 260.10, the term "facility" means all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. (Note: This definition differs from the definition of "facility" for purposes of corrective action under RCRA section 3004(u). See 50 FR 28712, July 15, 1985.)

C. Air Standards Under RCRA Section 3004(n)

Air emissions from hazardous wastes are generated or released from numerous sources at TSDF, including distillation and other organic separation units, surface impoundments, tanks, containers, landfills, land treatment facilities, wastepiles, and leaks from equipment associated with these operations.

In considering the regulation of air emissions under RCRA section 3004(n) and within the RCRA regulatory framework, EPA has concluded that air emissions from hazardous waste management facilities that are subject to RCRA subtitle C should be regulated under the authority of RCRA section 3004(n). Air emissions from facilities or units that manage solid wastes that are not regulated as hazardous wastes pursuant to 40 CFR part 261 (e.g., cement kiln dust waste) and air emissions from hazardous waste from units or facilities that are exempt from the permitting provisions of 40 CFR 270.1(c)(2) (e.g., wastewater treatment units with National Pollutant Discharge Elimination System (NPDES) permits) will be subject to control techniques guidelines or standards developed as needed under either the Clean Air Act (CAA) or RCRA authority. Air emissions from wastes managed in units subject to subtitle D (nonhazardous solid wastes such as those managed in municipal landfills) also will be subject to guidelines or standards issued under CAA or RCRA authority as appropriate.

Air emissions from hazardous wastes include photochemically reactive and nonphotochemically reactive organics, some of which are toxic or carcinogenic, and also may include toxic or carcinogenic inorganic compounds. Depending on the source, particulates (including metals, aerosols of organics, dust, as well as toxics and carcinogens) also may be released or generated. These emissions, which are released to the atmosphere from a wide variety of sources within TSDF, present diverse health and environmental risks. Therefore, EPA has developed a multiphased approach for regulating TSDF organic air emissions. This approach, described generally below, reflects EPA's understanding of the problem and knowledge of applicable, effective controls at this time.

Organic emissions from TSDF managing hazardous wastes contribute to ambient ozone formation and increase cancer and other health risks. Phases I and II of EPA's TSDF regulatory approach will significantly reduce emissions of ozone precursors and air toxics and carcinogens from TSDF by controlling emissions of organics as a class rather than controlling emissions of individual waste constituents. The regulation of organics as a class has the advantage of being relatively straightforward because it can be accomplished with a minimum number of standards, whereas the control of individual toxic constituents will require multiple standards. Regulating organics as a class also makes efficient use of EPA resource, avoids many of the complexities of having multiple standards, and reduces the number of constituents for which separate standards may be required.

The health and environmental effects of ambient ozone are well documented· measured in terms of monetary losses, they total hundreds of millions of dollars each year. Other health impacts of TSDF organic emissions are summarized in section VII.D of this preamble and are discussed in more detail in the BID that accompanies this final rule and in the draft BID for Phase II organic standards titled, "Hazardous Waste TSDF—Background Information for Proposed RCRA Air Emission Standards," available in Docket F–90–CESP–FFFFF. The substantial reductions in organic emissions achievable through implementation of Phase I and Phase II controls will reduce atmospheric ozone formation as a result of reductions in TSDF emissions of ozone precursors and will reduce nationwide cancer incidence and maximum individual risk due to exposure to air toxics and carcinogens emitted from TSDF.

Specifically, Phase I (which is being promulgated as final rules today) entails the promulgation of standards for the control of organic air emissions from selected hazardous waste management processes and equipment leaks. As discussed in the February 1987 proposal, EPA chose to develop this portion of its TSDF rulemaking first to prevent uncontrolled air emissions from land disposal restriction (LDR) treatment technologies. The technologies used in lieu of land disposal include the distillation/ separation processes subject to the Phase I rules. Publication of today's final rules for air emissions from hazardous waste management unit process vents from distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping processes and from leaks in piping and associated equipment handling hazardous wastes marks the completion of this first phase.

In the second phase, EPA will propose (in 1990) additional standards under section 3004(n) to control organic air emissions from other significant TSDF air emission sources not covered or not adequately controlled by existing standards. These sources include surface impoundments, tanks (including vents on closed, vented tanks), containers, and miscellaneous units.

The analyses of impacts indicate that, at some facilities, residual cancer risk to the most exposed individuals after implementing the first two phases of regulation will remain outside the risk range for other regulations promulgated under RCRA (which historically has been in the range of 1×10^{-4} to 1×10^{-6}). The EPA is therefore planning a third phase of the effort to control TSDF emissions in which various means for further reducing risk will be examined. In the interim, as explained in section VI.E, the omnibus permitting authority of RCRA is an available option for requiring additional emission and risk reductions beyond that achieved by today's final rules if it is decided, on a case-by-case basis, that additional control is needed to protect human health and the environment.

The EPA is currently involved in an effort to improve the data used in the current risk analyses and, in the third phase, will make use of any new data obtained. If additional constituent control is found to be necessary, the number of constituents for which additional control is needed is expected to be significantly less than if a constituent approach were used as the only means of regulating TSDF air emissions. Therefore, the EPA is convinced that the control of organics as a class followed by controls for individual toxic constituents, as necessary, will ultimately result in comprehensive standards that are protective while providing effective interim control.

Should additional regulation under Phase III be necessary, EPA is considering a variety of approaches for reducing residual risk associated with emissions from wastes managed at TSDF, and additional approaches may be developed in the future. For example, EPA could require additional technology control for toxic waste management (e.g., technology that ensures lower rates of leakage from equipment, if such technology can be developed for use at TSDF) or limit the quantities of specific constituents that can be managed at a TSDF. The constituents to be evaluated in Phase III will include those reported as being present in hazardous wastes managed by existing TSDF for which health effects have been established through the development of unit risk factors for carcinogens and reference doses for noncarcinogens.

D. Other RCRA Air Standards

The EPA has promulgated several standards under RCRA that reduce air emissions from TSDF. For example, several existing provisions in 40 CFR part 264 (40 CFR 264.251(f), 264.301(i), and 264.273(f)) require the implementation of general design and operating practices at permitted wastepiles, landfills, and land treatment operations to limit the release of particulate air emissions. The EPA has prepared a technical guidance document to aid in the implementation of these particulate rules; the document ("Hazardous Waste TSDF—Fugitive Particulate Matter Air Emissions Guidance Document," EPA-450/3-89-019) provides information on the sources of, and control technology for, particulate air emissions at TSDF. Additionally, 40 CFR part 264, subpart X, contains provisions that require prevention of air releases that may have adverse effects on human health or the environment at miscellaneous hazardous waste management units.

Air standards also have been promulgated for the control of air emissions from permitted hazardous waste incinerators (40 CFR part 264, subpart O). These standards require that incinerators be operated to achieve a destruction and removal efficiency (DRE) of at least 99.99 percent for those primary organic hazardous constituents listed in the facility permit. Higher efficiencies are required when the incinerator is burning certain specified waste types. These standards also limit air emissions of organics, hydrochloric acid, and particulates from incinerator stacks.

Air standards for interim status hazardous waste incinerators (40 CFR 265, subpart O) require monitoring of visible emissions and operating conditions. When burning specified wastes, these incinerators must receive a certification from the Assistant Administrator stating that the incinerator can meet the performance standards specified for permitted incinerators in 40 CFR 264, subpart O.

Interim status standards for other thermal treatment units are found in 40 CFR part 265, subpart P. These standards apply to facilities that thermally treat hazardous waste in devices other than enclosed devices using controlled flame combustion. The standards require monitoring of visible emissions and operating conditions of the combustion devices and prohibit open burning except for open burning and detonation of waste explosives.

The EPA has also proposed standards covering the burning of hazardous waste in boilers and industrial furnaces (52 FR 16987; May 6, 1987). These standards would require such burning to achieve a DRE of 99.99 percent for each principal organic hazardous constituent identified in the facility permit. In addition, a DRE of 99.99 percent must be achieved when burning certain specified constituents. The proposed standards also have provisions for burning low-risk wastes that allow an owner or operator to demonstrate that the burning of hazardous waste will not result in significant adverse health effects. To qualify for the low-risk waste exemption, an owner or operator would have to use dispersion modeling to demonstrate that emissions of carcinogenic compounds would not result in off-site ground-level concentrations that pose a risk to the most exposed individual of greater than 1×10^{5}. For noncarcinogenic compounds, the dispersion modeling would demonstrate that the resulting air concentrations would not exceed the reference air concentration (RAC) of individual hazardous compounds. The proposed standards would also limit emissions of carbon monoxide, metals, and hydrochloric acid from boilers and furnaces burning hazardous wastes.

E. Relationship of Air Standards to Other Subtitle C Rules

In addition to the air emission standards discussed above, EPA has ongoing programs that indirectly affect air emissions from hazardous waste. Today's rules are designed to complement other air standards under RCRA and the rules that might otherwise affect air emissions. Existing RCRA regulations that have the potential for affecting air emissions from hazardous waste TSDF include: (1) The LDR and (2) the corrective action program.

The LDR, developed under section 3004(m) of the HSWA, require that hazardous waste be treated to reduce concentrations of specific chemicals or hazardous properties to certain performance levels or by certain methods before the waste may be disposed of on land. Affected land disposal units include surface impoundments, wastepiles, landfills, and land treatment units. The EPA anticipates that LDR will substantially reduce the potential for air emissions from these land disposal sources. The first set of LDR, for certain dioxins and solvent-containing hazardous wastes, was promulgated on November 7, 1986 (51 FR 40572); the second set of restrictions, the "California list," was promulgated on July 8, 1987 (52 FR 25760); the "First Third" was promulgated on August 17, 1988 (53 FR 31138), and the "Second Third" on June 23, 1989 (54 FR 26597).

The treatment technologies evaluated under LDR for both wastewater and nonwastewater spent solvents include distillation and other separation processes subject to the requirements of the Phase I rules. Today's standards are designed to protect human health and the environment by reducing air emissions from technologies expected to be used to treat wastes prior to land disposal.

Under the authority of RCRA section 3004(u), EPA is developing rules to address releases of hazardous waste or hazardous constituents from solid waste management units (SWMU) that pose a threat to human health and the environment. Because this authority applies to contamination of soil, water, and air media, organic air emissions from SWMU at some TSDF would be addressed by the corrective action program EPA intends to propose under a separate rulemaking. The draft rules would establish health-based trigger levels measured at the TSDF boundary for determining whether further remedial studies are required to assess air emissions from a particular SWMU. Health-based cleanup standards would then be set for air emission levels that exceed acceptable health-based levels at the point at which actual exposure occurs. When such exposure is determined either through monitoring or modeling techniques, corrective action will be required to reduce such emissions at the point of compliance.

The corrective action program is designed to achieve site-specific solutions based on an examination of a particular TSDF and its environmental setting. It is not intended to set national standards that regulate organic air emissions from all TSDF. At sites where there are releases from SWMU to the atmosphere, organic emissions will be controlled based on site-specific exposure concerns. Furthermore, releases from the SWMU that contain hazardous solid wastes will also be subject to corrective action. Therefore, for air emissions, corrective action is in part designed to expeditiously address threats to human health and the environment that are identified prior to implementation of more comprehensive air emission standards. In addition, because corrective action can address a wider universe of SWMU, it will address, in some respects, exposure concerns that today's final standards do not address.

F. Relationship of Today's Final Standards to CERCLA

The CERCLA, as amended by the Superfund Amendments and Reauthorization Act (SARA), 42 U.S.C. 9601 et seq., authorizes EPA to undertake removal and remedial actions to clean up releases of hazardous substances, pollutants, or contaminants. Removal actions typically are immediate or expedited activities necessary to minimize exposure or danger to human health and the environment from the release of a hazardous substance, pollutant, or contaminant. Remedial actions are longer term, planned activities performed at sites listed on the National Priorities List to permanently clean up hazardous substances, pollutants, or contaminants and any soils, surface waters, or ground waters contaminated by these materials. On-site remedial actions are required by CERCLA section 121(d)(2) to comply with the requirements of Federal and more stringent State public health and environmental laws that have been identified by EPA or the delegated State authority as applicable or relevant and appropriate requirements (ARAR) to the specific CERCLA site. In addition, the National Contingency Plan (NCP) provides that on-site CERCLA removal actions "should comply with Federal ARAR to the extent practicable considering the exigencies of the circumstances" (40 CFR 300.65(f)). Today's final standards may be considered ARAR for certain on-site remedial and removal actions.

A requirement under a Federal or State environmental law may either be "applicable" or "relevant and appropriate," but not both, to a remedial or removal action conducted at a CERCLA site. "Applicable requirements," as defined in the proposed revisions to the NCP, means those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site (40 CFR 300.5 (proposed), 53 FR 51475 (December 21, 1988)). "Relevant and appropriate requirements" means those Federal or State requirements that, while not applicable, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site (53 FR 51478).

Some waste management activities used for remedial and removal actions to clean up hazardous organic substances use the distillation/separation operations regulated under subpart AA of today's rules. For example, hazardous organic liquid wastes and ground and surface waters contaminated with hazardous wastes may be treated on site using air stripping processes. Therefore, the organic emission control requirements of today's subpart AA rules may be "applicable" for on-site remedial and removal action activities that use distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that treat substances that are identified or listed under RCRA as hazardous wastes and have a total organic concentration of 10 ppmw or greater. In addition, off-site storage, treatment, and disposal of all wastes classified under RCRA as hazardous waste must be performed at a TSDF permitted under RCRA subtitle C. Thus, CERCLA wastes that are defined as hazardous under RCRA, contain more than 10 ppmw of total organics, and are shipped off site for management in distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations, would be subject to today's final standards like any similar RCRA hazardous waste. The new subpart AA control requirements for process vents may also be "relevant and appropriate" to on-site CERCLA removal and remedial actions that use distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations to manage substances that contain organics that are not covered by this rule (e.g., organics less than 10 ppmw or organics from nonhazardous wastes).

Today's final rules do not include control requirements for process vents on operations not associated with organics distillation/separation but typically associated with CERCLA remedial or removal actions such as soil excavation, in situ soil vapor extraction, in situ steam stripping of soil, soil washing, stabilization, bioremediation (in situ or otherwise), dechlorination, and low temperature thermal desorption. Therefore, the final rule for process vents would not be "applicable" to remedial or removal actions involving these processes at CERCLA sites. Also, the final process vent standards may not be considered "relevant and appropriate" for these same activities at CERCLA sites. Waste management operations involving soil excavation, in situ soil vapor extraction, in situ steam stripping of soil, soil washing, bioremediation, dechlorination, and low temperature thermal desorption can be considerably different from the waste management operations (i.e., distillation/separation processes) regulated in subpart AA. Control technologies for reducing organic emissions from these types of processes were not evaluated as part of today's rulemaking. However, the air emission potential of remedial and removal actions requiring excavation, land treatment, land farming, in situ treatment activities, and other treatment activities involving landfills and wastepiles should be determined, and, if necessary, the proper emission controls should be applied to these activities.

The organic emission control requirements of subpart BB for TSDF equipment leaks may also be considered as an ARAR for the equipment components (e.g., pumps and valves) installed at CERCLA cleanup sites that contain or contact substances containing 10 percent by weight or more total organics.

Although today's final standards would not be ARAR for all types of remedial and removal actions that are potential sources of organic air emissions, other existing RCRA or CAA regulations may qualify as ARAR for many of these activities. For example, subpart O of 40 CFR part 264 establishes standards of performance limiting organic emissions from thermal destruction processes (i.e., hazardous waste incinerators).

IV. Applicability and Requirements of Proposed Process Vent and Equipment Leak Standards

On February 5, 1987 (52 FR 3748), EPA proposed standards under RCRA section 3004(n) for the control of organic air emissions from certain equipment and process vents at hazardous waste TSDF. The proposed standards would have applied to equipment and process vents "in volatile hazardous air pollutant (VHAP) service" (i.e., containing or contacting liquids, gases, or other derivatives of hazardous waste in concentrations greater than 10 percent total organics) located at TSDF required to have a RCRA permit. The decision as to whether equipment or process vents would be covered by the rule (i.e., would ever contain or contact wastes greater than 10 percent total organics) could be based either on testing the waste and derivatives according to specified test procedures or on engineering judgment as to these materials, total organic content.

The proposed standards would have required a 95-percent reduction in organic emissions from vents in VHAP service on product accumulator vessels and on other process vent sources (e.g., vents on closed accumulator tanks on other processes). The preamble for the proposed standard, at 52 FR 3753, described "product accumulator vessels" as types of equipment that generate process emissions and include distillate receivers, surge control vessels, product separators, or hot-wells that are vented to the atmosphere either directly or through a vacuum-producing system. Product accumulator vessels included units used to distill and steam or air strip volatile components from hazardous waste; examples include distillation columns, steam stripping columns, air stripping units, and thin-film evaporation units at TSDF.

The proposed standards would have regulated actual reclamation processes for the first time. Only recycling units at TSDF already subject to RCRA permit requirements (e.g., because of storage activity on the facility) would have been subject to the proposed air standards. Both new and existing units would have been required to have add-on control devices designed to achieve a 95-percent reduction (based on the application of secondary condensers) and to operate within that design. Once in operation, the facilities would have demonstrated compliance by monitoring the operation of the control device.

The proposed standards also would have required implementation of a monthly leak detection and repair (LDAR) program for valves, pumps, compressors, pressure relief devices, and closed-vent systems used to handle hazardous wastes and their derivatives at TSDF. Control systems, leak definition methodology, leak definitions, and repair schedules were based on existing equipment leak standards developed under sections 111 and 112 of the CAA.

Since proposal, EPA has made several important changes to the standards based on the public comments received after proposal and analyses resulting from these comments. The applicability and requirements of the final standards, including the changes made since proposal, are discussed in section V. The EPA's responses to the major comments are summarized in section VI. Additional information is presented in the BID for the final standards.

V. Applicability and Requirements of Today's Final Standards

This section provides a detailed summary of the final standards as they apply to the affected TSDF community and to process vents and equipment subject to today's rule. Also summarized is the relationship of the final standards to existing exemptions under the RCRA regulatory program.

A. Scope of Final Standards

Today's final standards limit organic air emissions as a class at TSDF that are subject to regulation under subtitle C of RCRA. This action is the first part of a multiphased regulatory effort to control air emissions at new and existing hazardous waste TSDF. These rules establish final standards limiting organic emissions from (1) process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping operations that manage hazardous wastes with 10 ppmw or greater total organics concentration on an annual average basis, and (2) leaks from equipment that contain or contact hazardous waste streams with 10 percent by weight or greater total organics.

The final standards do not expand the RCRA-permitted community for the purposes of air emissions control. As promulgated, the final standards control organic emissions only from process vents and equipment leaks at hazardous waste TSDF that are subject to permitting requirements under RCRA section 3005 and are applicable only to specific hazardous waste management units. The rules apply to hazardous waste management units that are subject to the permitting requirements of part 270 and to hazardous waste recycling units that are located at facilities otherwise subject to the permitting requirements of part 270. Exempt units, other than recycling units (e.g., 90-day accumulation tanks and wastewater treatment units as specified in § 270.1(c)(2)), are not subject to the rules even when they are part of a permitted facility. Permitting aspects are further discussed in section IX.

The term "organics" is used in the final standards instead of "volatile organics" to avoid confusion with "volatile organic compounds" (VOC) that are regulated as a class under the CAA. To be subject to the standards, a TSDF: (1) Must have equipment that contains or contacts hazardous wastes that are 10 percent or more by weight total organics, or (2) must have distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that treat or process hazardous wastes with total organics concentrations of 10 ppmw or greater on a time-weighted annual average basis.

The final regulations require the facility owners or operators to determine whether their equipment is subject to the equipment leak rules, subpart BB of parts 264 and 265. The owner or operator of a facility may rely on engineering judgment for this determination, or, if the waste's organic content is questionable, the owner or operator may choose any of the test methods identified in the final rule for determining whether a piece of equipment contains or contacts hazardous wastes that are 10 percent or more total organics by weight. As proposed, these methods include: ASTM Methods D-2267-88, E 169-87, E 168-88, and E 260-85 and Methods 9060 and 8240 of SW-846. The owner or operator also may use any other test method for determining total organic content that is demonstrated to be equivalent to the test methods identified in the rule using the petition process described in 40 CFR 260.21. The test method selected should be the one best suited for the characteristics of the waste stream. Regardless of the method chosen, the final standard requires the facility owner or operator to determine that the organic content is never expected to exceed 10 percent. The determination of organic content of the waste must at all times be appropriate to the wastes currently being managed in the relevant units. If any action is taken that would result in the determination no longer being appropriate to the facility's or a particular unit's operations (e.g., an upstream process change that results in a change in a waste's organic content), then a new determination is required.

To determine whether a particular hazardous waste management unit of the type specified in the rule (e.g., a steam stripping or air stripping unit) is subject to the provisions of subpart AA of parts 264 and 265, the owner/operator is required to determine the total organic concentration of the waste managed in the unit initially (by the effective date of the standards or when the waste is first managed in the waste management unit) and thereafter on a periodic basis (for continuously generated wastes). A waste determination for subpart AA applicability would not be necessary when an owner/operator manages the waste in a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping unit that is controlled for organic emissions and meets the substantive requirements of subpart AA.

Determination that the time-weighted, annual average total organic concentration of the waste managed in the unit is less than 10 ppmw must be performed by direct measurement or by knowledge of the waste as described later in this section. Direct measurement of the waste's total organic concentration must be performed by collecting individual grab samples of the waste and analyzing the samples using one of the approved reference methods identified in the rule.

The EPA is requiring that analytical results for a minimum of four samples be used to determine the total organic concentration for each waste stream managed in the unit. In setting the minimum number of samples at four, EPA will obtain sufficient data to characterize the total organic concentration of a waste without imposing an unnecessary burden on the owner/operator to collect and analyze the samples.

Waste determinations must be performed under process conditions expected to result in the maximum waste organic concentration. For waste generated on site, the samples must be collected at a point before the waste is exposed to the atmosphere such as in an enclosed pipe or other closed system that is used to transfer the waste after generation to the first affected distillation/separation operation. For waste generated off site, the samples must be collected at the inlet to the first waste management unit that receives the waste, provided the waste has been transferred to the facility in a closed system such as a tank truck, and the waste is not diluted or mixed with other waste.

The location where the waste's total organic content is determined is important because sampling location can greatly affect the results of the determination. This effect occurs because the concentration level can decrease significantly after generation as the waste is transferred to (and managed in) various waste management units.

If the waste is directly or indirectly exposed to ambient air at any point, a portion of the organics in the waste will be emitted to the atmosphere, and the concentration of organics remaining in the waste will decrease. For example, for highly volatile organic compounds such as butadiene, all of the compound would evaporate within a few seconds of exposure to air. To ensure that the determination of total organic concentration is an accurate representation of the emission potential of a waste upon generation, it is essential that the waste determination be performed at a point as near as possible to where the waste is generated, before any exposure to the atmosphere can occur.

For the reasons stated above, the waste determination must be based on the waste composition before the waste is exposed, either directly or indirectly, to the ambient air. Direct exposure of the waste to the ambient air means the waste surface interfaces with the ambient air. Indirect exposure of the waste to the ambient air means the waste surface interfaces with a gas stream that subsequently is emitted to the ambient air. If the waste determination is performed using direct measurement, the standards would require that waste samples be collected from an enclosed pipe or other closed system that is used to transfer the waste after generation to the first hazardous waste management unit. If the waste determination is performed using knowledge of the waste, the standards would require that the owner or operator have documentation attesting to the organic concentration of the waste before any exposure to the ambient air.

The location where the waste determination would be made for any one facility will depend on several factors. One factor is whether the waste is generated and managed at the same site or generated at one site and transferred to a commercial TSDF for management. Another important factor is the mechanism used to transfer the waste from the location where the waste is generated to the location of the first waste management unit (e.g., pipeline, sewer, tank truck). For example, if a waste is first accumulated in a tank using a direct, enclosed pipeline to transfer the waste from its generation process, then the waste determination could be made based on waste samples collected at the inlet to the tank. In contrast, if the waste is first accumulated in a tank using an open sewer system to transfer the waste from its generation process then the waste determination would need to be made based on waste samples collected at the point where the waste enters the sewer before the waste is exposed to the ambient air. Where the waste is generated off site, the owner or operator may make the determination based on samples collected at the inlet to the first waste management unit at the TSDF that receives the waste, provided the waste has been transferred to the TSDF in a closed system such as a tank truck and the waste is not diluted or mixed with other waste. If a waste determination indicates that the total organic concentration is equal to or greater than the applicability criterion, then the owner or operator would be required to comply with the standards.

As an alternative to using direct measurement, an owner/operator is allowed to use knowledge of the waste as a means of determining that the total organic concentration of the waste is less than 10 ppmw. Examples of information that might be considered by EPA to constitute sufficient knowledge include: (1) Documentation that organics are not involved in the process generating the waste, (2) documentation that the waste is generated by a process that is identical to a process at the same or another facility that has previously been determined by direct measurement to generate a waste stream having a total organic content less than 10 ppmw, or (3) previous speciation analysis results from which the total concentration of organics in the waste can be computed and it can be documented that no process changes have occurred since the analysis that could affect the waste's total organic concentration. The final standards include the provision that EPA can require that the waste be analyzed using Method 8240 if EPA believes that the documentation is insufficient to determine an exception by knowledge of the waste (§§ 264.1034(f) and 265.1034(f)).

To address the temporal variability that can occur both within a particular waste stream and within the various waste streams managed in a hazardous waste management unit, the final rules require a time-weighted, annual average concentration to characterize the waste managed in the unit. The final rules require that an owner/operator repeat the waste determination whenever there is a change in the waste being managed or a change in the process that generates or treats the waste that may affect the regulatory status of the waste or, if the waste and process remain constant, at least annually. For example, continuous processes are more likely to generate a more homogeneous waste than batch operations; batch operations involve processes that may frequently involve change in materials or process conditions. Batch operations, therefore, usually generate wastes with varying characteristics, including such characteristics as organics content. Ground water concentrations would also be expected to show significant variation if more than one well provides influent to a waste management unit such as an air stripper and the wells that feed the unit are varied over time or if the proportions from the wells that make up the influent are changed. This is because there is typically considerable spatial variability in contaminated ground water concentrations. The situation where feed wells are changed and the change is not accounted for in the initial waste determination would be considered a process change or change in the waste being managed that would require a new determination.

With the time-weighted, annual average applicability criterion, a hazardous waste management unit would not be subject to this rule if it occasionally treats wastes that exceed 10 ppmw if at other times the wastes being treated in the unit are such that the weighted annual average total organic concentration of all wastes treated is less than 10 ppmw. The time-weighted, annual average is calculated using the annual quantity of each waste stream managed in the unit and the mean organic concentration of each waste stream.

Determining the applicability of the standards to affected processes, units, and facilities is of paramount importance to the TSDF owner or operator in complying with the final standards. A mistake even an inadvertent one, will not excuse a facility owner or operator from the obligation to comply with either the requirements of the standards or with potential enforcement actions. Accurate determinations of what equipment and vents must be controlled are crucial to ensuring that all equipment and vents subject to this rule are in fact controlled. When the facility owner/operator and the Regional Administrator disagree on the determination of emissions or emission reduction achieved, then a performance test conducted as specified in the rules must be used to resolve the disagreement. In situations where the owner/operator and Regional Administrator disagree on whether a unit manages a waste with 10 ppmw or greater organics content or a piece of equipment contains or contacts a waste with 10 percent or more organics content, then procedures that conform to the test methods referenced in the rules may be used to resolve the disagreement.

Consistent with section 3010 of RCRA, the final standards for process vent and equipment leak control and monitoring become effective 6 months from today. Owners and operators must come into compliance with these requirements by the effective date; however, where compliance involves the installation of a control device, EPA is requiring that installation be completed as soon as possible but no later than 24 months from the date the regulatory action affecting the unit is published or promulgated. To obtain the extended time for compliance (18 months beyond the effective date), a facility must show that installation cannot reasonably be expected to be completed earlier. In these circumstances, an owner/operator must develop an implementation schedule that indicates when the installation will be completed and shows that additional time is necessary. The implementation schedule must be included in the operating record by the effective date of the rules. Changes in the implementation schedule are allowed within the 24-month time frame if the owner/operator documents that the change cannot reasonably be avoided.

B. Standards for Process Vents

Affected Equipment

A "process vent" is a pipe, stack, or other opening through which emissions from a hazardous waste management unit are released to the atmosphere either directly, through a vacuum-producing system, or indirectly, through another tank. The process vents that would have been covered by the proposed standard included vents associated with any hazardous waste management process or waste management unit.

Review of the hazardous waste TSDF industry has shown that process vents are most typically associated with processes related to distillation or other separation operations. These technologies were also the type being evaluated under the LDR for spent solvents. Therefore EPA concentrated its analysis of process vents on those hazardous waste management units that are involved in solvent or other organic chemical separation or reclamation by distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations. This should include the largest segment of process vents at TSDF and address those sources with the greatest emission potential. Vents on other types of waste management units (e.g. vents on storage tanks) are being addressed in the Phase II rulemaking.

Two basic changes have been made since proposal that clarify the applicability of the final vent standard. First, to avoid confusion with tanks not associated with the processing of waste streams, the term "product accumulator vessel" has been deleted from the final standard and affected equipment is more specifically defined. The applicability of the final standard for process vents also has been clarified since proposal to exclude air emissions from vents on other closed (covered) and vented tanks not associated with the specified distillation/separation processes to avoid regulatory duplication of the Phase II standards as discussed above.

Thus, the final vent standards apply to: (1) Vents on distillation fractionation, thin-film evaporation, solvent extraction, and air or steam stripping processes and vents on condensers serving these processes; and (2) vents on tanks (e.g., distillate receivers, bottoms receivers, surge control tanks, separator tanks, and hot wells associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air or steam stripping processes) if emissions from these processes are vented through the tank. For example, *uncondensed overhead* emitted from a distillate receiver (which fits the definition of a tank) serving a hazardous waste distillation process unit is subject to these Phase I air controls. On the other hand, emissions from vents on tanks or containers that do not derive from a process unit specified above are not covered by these rules. For example, if the condensed (recovered) solvent is pumped to an intermediate holding tank following the distillate receiver mentioned in the above example, and the intermediate storage tank has a pressure-relief vent (e.g., a conservation vent) serving the tank, this vent will not be subject to the process vent standards. Emissions from vents that are not covered under today's rules will be addressed by Phase II of the air standards under section 3004(n).

Second, the terms "VHAP" and "in VHAP service" have been deleted from the final rule in response to public comments. Commenters found the terms inappropriate for transfer from equipment leak standards developed under section 111 or 112 of the CAA to RCRA standards for organic emissions from hazardous waste. The EPA agrees with these commenters; these terms can be confusing and they are unnecessary for these rules. Therefore, the cross-reference to part 61 has been eliminated and the wording of the final regulation has been revised to reflect applicability based on clearly specified hazardous waste management processes or unit operations that manage wastes with a 10 ppmw or greater total organic content.

Requirements of Final Standard for Process Vents

In response to public comments, several changes have been made to the proposed standard for process vents. While the proposed 95-percent emission reduction standard would have applied to individual process vents emitting organics with concentrations of 10 percent or greater by weight, the final process vent 95-percent emission reduction standard applies to total organic emissions from the combination of all affected vents (i.e., vents subject to the provisions of subpart AA) at the facility. As discussed in section VI of this preamble and in the BID for the final rules, the term "facility" refers to the entire site that is under control of the owner or operator engaged in hazardous waste management. Thus, organic emissions from affected process vents anywhere on the hazardous waste management facility are subject to the standards.

The 10-percent concentration criterion for process vents has not been included in the final rules because the promulgated standards contain a facility-based emission rate limit of 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr) that is more effective in controlling emissions from affected sources and excluding facilities with little emission reduction potential. Based on emissions and health risk analyses conducted in response to comments, this emission rate limit represents an emission level from process vents that is protective of human health and the environment and below which additional meaningful reductions in nationwide health risk and environmental impacts attributable to process vents cannot be achieved. Control of facilities with process vent emissions less than the emission rate limit would not result in further reductions of either cancer risk or incidence on a nationwide basis. Facilities with organic emissions from process vents that do not exceed these emission rates will not have to install controls or monitor emissions from affected process vents. Selection of the emission rate limit is addressed in section VI.B of this preamble and in chapters 4.0 and 7.0 of the BID.

Because the emission rate limits (3 lb/h and 3.1 ton/yr) provide health-based limits, EPA considered dropping completely the organic content criterion (i.e., at least 10 percent total organics). However, EPA decided not to completely eliminate the organic content criterion because it is not clear that the same controls can be applied to very low concentration streams as can be applied to the higher concentration streams that generally are associated with emission rates greater than the limits. For low-concentration streams, EPA questions whether controls are needed on a national or generic basis but is unable to resolve this question at this time. Thus, EPA decided to defer controlling very low concentration streams until it is better able to characterize and assess these streams and the appropriate controls.

Once EPA decided to consider facilities that manage very low concentration organic wastes as a separate category, there remained the problem of determining the appropriate criterion. The EPA examined existing data on air strippers, the treatment device most commonly used with low-concentration streams; it appeared that the quantity of emissions and the risk associated with air strippers treating streams with concentrations below 10 ppmw may be relatively small, thus minimizing the potential harm of deferring control until a later time. Examples of facilities managing low-concentration wastes are sites where ground water is undergoing remedial action under CERCLA or corrective action pursuant to RCRA. Given the limited set of precise data available, and the comments that the 10-percent criterion was too high, EPA determined that an appropriate criterion would be 10 parts per million (ppm) total organics in the waste by weight.

The 10-ppmw criterion is not an exemption from regulation; it is intended only as a way for EPA to divide the air regulations into phases. The EPA is deferring action on very low concentration streams (i.e., ones with less than 10 ppmw total organic content) from the final rule today but will evaluate and announce a decision later on whether to regulate these waste streams.

To comply with the final standards for process vents, the TSDF owner or operator is required to identify all process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and stripping processes that are treating hazardous waste with a 10-ppmw or greater total organics concentration on a time-weighted annual average basis (i.e., vents affected by the rules). Organic emission rates for each affected vent and for the entire facility from all affected vents must be determined. The facility process vent emission rate must then be compared to the short- and long-term process vent emission rate limits (3 lb/h or 3.1 ton/yr) to determine whether additional emission controls are required. If the process vent emission rate limit is exceeded, the owner or operator must take appropriate action to reduce total facility emissions from affected process vents to below the cutoff level or install additional emission controls to reduce total facility process vent organic emissions by 95 weight percent. If an incinerator, process heater, or boiler is used as a control device, the volume concentration standard of 20 ppmv can be met instead of the 95-weight-percent reduction (§§ 264.1033(c), 264.1060, 265.1033(c), and 265.1060).

Because the final rules could apply to dilute process vent streams and the rule is formatted in terms of a weight-percent reduction standard, it is necessary to include the volume concentration standard in the final control device standards to account for the technological limitations of enclosed combustion devices (48 FR 48933, October 21, 1983), one of the control technologies examined as part of the rulemaking, treating dilute streams. Below a critical concentration level, the maximum achievable efficiency for enclosed combustion devices decreases as inlet concentration decreases; thus, for streams with low organic vapor concentrations, the 95-percent mass reduction may not be technologically achievable in all cases. Available data show that 20 ppmv is the lowest outlet concentration of total organic compounds achievable with control device inlet streams below approximately 2,000 ppmv total organics. Therefore, a concentration limit of 20 ppmv has been added as an alternative standard for incinerators, process heaters, and boilers to allow for the drop in achievable destruction efficiency with decreasing inlet organics concentration. For consistency, the 20-ppmv concentration is expressed as the sum of the actual individual compounds, not carbon equivalents, on a dry basis corrected to 3 percent oxygen. For facilities that do not meet the emission rate limit, the final process vent standards require that control devices achieve a 95-percent reduction in total organic emissions for the facility or, in the case of enclosed combustion devices, a reduction of each process vent stream to a concentration of no more than each process vent stream to a concentration of no more than 20 ppmv total organic compounds.

The final standards for process vents do not require the use of any specific equipment or add-on control device; the standards can be met using several types of controls. Depending on the characteristics of the process vent stream, either a condenser or a carbon adsorber will likely be the control technology of choice. However, other control devices such as flares, incinerators, process heaters, and boilers, as well as any other device of the owner or operator's choice, also can be used where applicable to achieve compliance.

Operating requirements for closed-vent systems and control devices are included in §§ 264.1033 and 265.1033. A closed-vent system means a system not open to the atmosphere and composed of piping, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device. If vapor recovery systems such as condensers and adsorbers are used as control devices, they must be designed and operated to recover the organic vapors vented to them with an efficiency of 95 percent or more unless the total organic emission limits for affected process vents (§§ 264.1032 and 265.1032) can be attained at efficiencies less than 95 percent. Vapor recovery systems whose primary function is the recovery of organics for commercial or industrial use or reuse (e.g., a primary condenser on a waste solvent distillation unit) are not considered a control device and should not be included in the 95-percent emission reduction determination.

If enclosed combustion devices such as incinerators, boilers, or process heaters are used, they must be designed and operated to achieve a total organic compound emission reduction efficiency of 95 percent or more or must provide a minimum residence time of 0.5 s at a minimum temperature of 760 °C. The latter are general design criteria established by EPA, and used in numerous rulemakings, that can be used by facilities in lieu of conducting a site-specific design for enclosed combustion devices. The operating requirements for closed-vent systems and control devices include a provision allowing enclosed combustion devices to reduce organic emissions to a total organic compound concentration of 20 ppmv, by compound, rather than achieve the 95-weight percent reduction.

If flares are used, they must be designed and operated with no visible emissions as determined by the procedures of Reference Method 22, except for periods not to exceed a total of 5 min during any 2 consecutive hours. The final standard specifies that flares must be operated with a flame present at all times and must be operated at all times when emissions may be vented to them. In addition, flares must provide a net heating value of the gas being combusted of 11.2 megajoules per standard cubic meter (MJ/scm) or more, be steam-assisted or air-assisted, or provide a net heating value of 7.45 MJ/scm or more if the flare is nonassisted. Specific design and operating requirements for steam-assisted, air-assisted and nonassisted flares also are included in the final standard. Calculations and procedures for determining the net heating value of the gas being combusted the actual exit velocity and the maximum allowed velocity are included in the final provisions for closed-vent systems and control devices (see §§ 264.1033(d) and 265.1033(d)).

Facilities must maintain documentation in the operating record supporting waste determinations, identifying affected process vents, affected waste management unit throughputs and operating hours, emission rates for each affected vent and for the overall facility, and the basis for determining the emission rates (§§ 264.1035(b)(2) and 265.1035(b)(2)). Regardless of the type of control device used, the documentation must certify that add-on control devices achieve the emission rate limit by design and during operation, or that add-on control devices achieve a 95-percent reduction in organics or achieve the 20-ppmv organics concentration limit by design and during operation where the emission rate limit is not attained. The design documentation must present the basis for determining the design emission reduction and establish the basic values for operating parameters used to monitor the control device s operation and maintenance. The design control level (i.e., the emission reduction needed to achieve the emission rate cutoff or 95-percent emission reduction) can be documented by vendor/manufacturer certifications, by engineering calculations, or through source tests to show that the control device removes the required percentage of organics entering the device. All required information and documentation must be kept in the facility s operating record. The facility's waste determinations and process vent emission rate determinations must at all times reflect the facility's current waste management unit designs and wastes managed. If the owner/ operator takes any action that would result in the determination no longer being appropriate to the facility's operations (e.g., if a waste of different composition is managed, the operating hours of the affected management units are increased beyond what was originally considered, or a new affected unit is added that may impact its regulatory status), then a new determination is required (§§ 264.1035(b)(2)(ii) and 265.1035(b)(2)(ii)). In addition, certain information regarding the facility's emission determination and control device design must be included in the facility's part B permit application.

The final rules require the continuous monitoring of specific parameters on all control devices needed to meet the standards to ensure that the devices perform according to their design (§§ 264.1033(f) and 265.1033(f)). The final rules clarify the general parameters listed in the proposal by describing the requirements in greater detail. Operating parameters are specified for condensers, carbon adsorbers, flares, incinerators, and other enclosed combustion devices. Although minimum operating conditions are identified for organic vapor destruction devices (e.g., incinerators and flares) to ensure 95-percent destruction, values or ranges of values for recovery device (i.e., condensers and carbon adsorbers) operating parameters cannot be specified on an industry-wide basis. Therefore, a recovery device must be designed for the particular application and monitored to ensure that it is being operated within design specifications. Proper design shall be determined through engineering calculations vendor certification, and/or emission testing.

The owner/operator is required to record the control device monitoring information, including the basis for the operating parameters used to monitor control device performance, in the facility operating record. Periods when monitoring indicates control device operating parameters are outside established tolerances on design specifications must be recorded. Facilities with final permits incorporating these standards (i.e., facilities subject to the provisions of 40 CFR part 264 subpart AA) must report exceedances that are not corrected within 24 hours to the Regional Administrator on a semiannual basis. The records and reports must include the dates, duration, cause, and corrective measures taken. (See §§ 264.1036(a) and 264.1065(a)(4).)

The specific monitoring requirements for control device operating parameters include: (1) Continuous monitoring of coolant fluid temperature and exhaust gas temperatures or the concentration level of organic compounds in the exit gas stream for condensers; (2) continuous monitoring of exhaust gas organic breakthrough for carbon adsorbers; (3) continuous monitoring of combustion zone temperature for incinerators, boilers and process heaters; and (4) the presence of a pilot flame using a thermocouple or any other equivalent device to detect the presence of a flame for flares.

The final standards would require that emission control equipment is properly designed, installed, operated, and maintained. Also, as previously described, the standards would require continuous monitoring of specific control device operating parameters. A control device monitor reading outside the operating range allowed by the standards (referred to in this preamble as a "control device exceedance") indicates that the control device is not operating normally or is malfunctioning (i.e., not operating at the design setting necessary to achieve at least 95 percent organic emission control efficiency). Action must be taken by the owner or operator to return the control device to operating at the design setting. When a control device exceedance cannot be corrected within 24 hours of detection, the final standards would require the owner or operator to record specific information concerning the control device exceedance. Facilities with final RCRA permits must report this information to EPA on a semiannual basis; interim status facilities are not required to report control device exceedances. The exceedance report would need to describe the nature and period of each control device exceedance and to explain why the control device could not be returned to normal operation within 24 hours. A report would need to be submitted to EPA only if control device exceedances have occurred during the past 6-month reporting period. These reports would serve to aid EPA in determining the owner's or operator's ability to properly operate and maintain the control device. The EPA recognizes that a control device malfunction may occur due to circumstances beyond the control of the owner or operator (e.g., defective equipment supplied by the manufacturer). Therefore, a single control device exceedance may not necessarily be indicative of improper control device operation or maintenance.

C. Equipment Leak Standards

Affected Equipment

The final standards apply to each valve, pump, compressor, pressure relief device, open-ended valve or line, flange or other connector, and associated air emission control device or system that contains or contacts hazardous waste streams with 10 percent or more total organics by weight.

In response to public comments, EPA has changed the applicability of the final LDAR standards for pumps and valves to better relate to the volatility of the wastes managed and thus to air emission potential. The requirements for pumps and valves have been revised to include the heavy liquid provisions contained in EPA's new source performance standard (NSPS) for equipment leaks of VOC in the synthetic organic chemicals manufacturing industry (SOCMI) (40 CFR part 60, part VV). The heavy liquid provisions (§§ 264.1058 and 265.1058) exempt pumps and valves processing lower vapor pressure substances from the routine leak detection monitoring requirements of the standards. By their nature, heavy liquids exhibit much lower volatilities than do light liquids, and because equipment leak rates and emissions have been shown to vary with stream volatility, emissions from heavy liquids are less than those for lighter, more volatile streams. For example, EPA analyses indicate that emissions from valves in heavy liquid service are more than 30 times lower than the emissions from valves in light liquid service.

Pumps and valves are in light liquid service if the vapor pressure of one or more or the components being handled by the piece of equipment is greater than 0.3 kilopascal (kPa) at 20 °C, if the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight, and if the fluid is a liquid at operating conditions. Pumps and valves not in light liquid service are defined to be in heavy liquid service.

The regulations governing equipment leaks also have been incorporated and reprinted in the final standards to eliminate cross-referencing to part 61 regulations and to consolidate the requirements under RCRA.

Equipment Leak Control Requirements

The control requirements for valves are based on LDAR requirements. Valves in light liquid or gas/vapor service (§§ 264.1057 and 265.1057) must be monitored using Reference Method 21; an instrument reading at or above 10,000 ppm indicates the presence of a leak. If a leak is detected, the valve must be repaired as soon as practicable but no later than 15 days after the leak is detected. A first attempt to repair the valve must be made no later than 5 days after the leak is detected. First attempts at repair include, but are not limited to, tightening or replacing bonnet bolts tightening packing gland nuts, or injecting lubricant into the lubricated packing.

Monthly monitoring is required; however, any valve for which a leak is not detected for 2 successive months may be monitored the first month of each succeeding quarter until a leak is detected (§§ 264.1057(c) and 265.1057(c)). If a leak is detected the valve must be monitored monthly until a leak is not detected for 2 successive months.

In addition, monthly monitoring is not required if: (1) A leakless valve, such as a sealed-bellows valve, is used to achieve a no-detectable-emissions limit (500 ppm above background, as measured by Method 21, with an annual performance test; §§ 264.1057(f) and

265.1057(f); (2) the owner or operator meets a performance level of 2 percent of all valves leaking (§§ 264.1061 and 265.1061); (3) the owner or operator elects to comply with a skip-period leak detection and repair program as described for valves (§§ 264.1062 and 265.1062); or (4) the valve is designated by the owner or operator as unsafe-to-monitor or difficult-to-monitor (§§ 264.1057 (g) and (h) and 265.1057 (g) and (h)). A valve may be designated as unsafe-to-monitor if monitoring personnel would be exposed to an immediate danger as a consequence of monitoring and if the owner or operator adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times. A valve may be designated as difficult-to-monitor if the valve cannot be monitored without elevating monitoring personnel more than 2 m above a support surface, the valve is in an existing hazardous waste management unit and the owner or operator follows a written plan that requires monitoring at least once a year.

The EPA is continuing to study the status of new technology available for the control of air emissions from valves. The EPA has issued a separate notice in the **Federal Register** that discusses available information on leakless valve technology (54 FR 30228, July 19, 1989). Public comments were requested in that notice on several aspects of the technology to assist EPA in determining applications for which leakless valve technology would be appropriate at hazardous waste TSDF.

The final standards also require monitoring for pumps at TSDF containing or contacting wastes with greater than 10 percent organics (§§ 264.1052 and 265.1052). Each pump in light liquid service must be monitored monthly with a portable vapor analyzer following the EPA Reference Method 21 protocol. In addition, each pump in light liquid service must be checked weekly by visual inspection for indications of liquids dripping from the pump seal. A pump is determined to be leaking if an instrument reading of 10,000 ppm or greater is measured or there are indications of liquids dripping from the pump seal. When a leak is detected, it must be repaired as soon as practicable, but not later than 15 days after it is detected unless the delay-of-repair provisions specified in the rule apply. The first attempt at repair must be made within 5 calendar days of the leak being detected.

Pumps in light liquid service are exempt from the monitoring requirements under §§ 264.1052 (d) and (e) and 265.1052 (d) and (e) if: (1) The pump is equipped with a dual mechanical seal system that includes a barrier fluid between the two seals, (2) a magnetically coupled or diaphragm pump is used to achieve a no-detectable-emissions limit (indicated by a portable organic vapor analyzer reading of less than 500 ppm above background), or (3) the pump is equipped with a closed-vent system capable of transporting any leakage from the seal or seals to a 95-percent efficient control device. If pumps are equipped with a dual mechanical seal system, emissions from the barrier fluid reservoir must be vented to a control device designed and operated to achieve a 95-percent control efficiency, the barrier fluid must be purged and added to the hazardous waste stream, or the pressure of the barrier fluid must be maintained at a level above the pressure in the pump or exhauster stuffing box. A pressure or level indicator to detect any failure of the seal system or the barrier fluid system is required, with the indicator checked daily or equipped with an alarm to signal failure of the system. If leakless equipment is used, such as magnetically coupled or diaphragm pumps, the standards require an annual performance test by Method 21 to verify the no-detectable-emissions status of the equipment.

Compressors must be equipped with a seal system that includes a barrier fluid system that prevents leakage of organic emissions to the atmosphere. The seal system must be operated with the barrier fluid at a pressure that is greater than the compressor stuffing box pressure, be equipped with a barrier fluid system that is connected by a closed-vent system to a control device that meets the design and operating requirements established in §§ 264.1060 and 265.1060, or be equipped with a system that purges the barrier fluid into a hazardous waste stream with zero total organic emissions to the atmosphere. In addition, the barrier fluid system must be equipped with a sensor that detects failure of the seal system, barrier fluid system, or both. A compressor is determined to be leaking if the sensor indicates failure of the seal system, the barrier fluid system, or both. When a leak is detected, it must be repaired as soon as practicable, but not later than 15 calendar days after it is detected; a first attempt at repair must be made within 5 calendar days.

Except during emergency pressure releases, each pressure relief device in gas/vapor service must be operated with no detectable emissions (500 ppm above background, as measured by Reference Method 21) (§§ 264.1054 and 265.1054). No later than 5 calendar days after any pressure release, the device must be returned to a condition of no detectable emissions and be monitored to confirm that status. Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage to a control device that meets the requirements of §§ 264.1060 and 265.1060 is exempt from these requirements.

Each open-ended valve or line must be equipped with a cap, blind flange, plug, or second valve (§§ 264.1056 and 265.1056). The cap, blind flange, plug, or second valve must seal the open end at all times except during operation requiring hazardous waste stream flow through the open-ended valve or line. Operational requirements for second valves and double block and bleed systems also are specified in the final regulation.

Pumps and valves in heavy-liquid service, pressure relief devices in light-liquid or heavy-liquid service, and flanges and other connectors must be monitored within 5 days by Reference Method 21 if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method (§§ 264.1058 and 265.1058). A leak is detected if an instrument reading of 10,000 ppm or greater is measured. When a leak is detected, it shall be repaired as soon as practicable but not later than 15 calendar days after detection. The first attempt at repair must be made within 5 calendar days of the leak being detected.

The final standards also include provisions for delay of repair (§§ 264.1059 and 265.1059). Delay of repair of leaking equipment is allowed if the repair is technically infeasible without a hazardous waste management unit shutdown (i.e., a work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit). However, repair of the leak must be performed before the end of the next shutdown of that unit. Delay of repair also is allowed for equipment (i.e., either pumps or valves) that is isolated from the hazardous waste management unit and is prevented from containing or contacting a hazardous waste with 10 percent or more organic content. For valves, delay of repair is allowed if: (1) The owner or operator determines that emissions of purged material resulting from immediate repair are greater than the emissions likely to result from delay of repair, and (2) when the valve is repaired the purged materials are collected and destroyed or recovered in a control device complying with the requirements of the standards. Delay of repair beyond a hazardous waste management unit shutdown is allowed only if valve assembly replacement is necessary during the next shutdown of the unit, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before supplies were depleted (i.e., the owner/operator has made a good-faith effort to maintain adequate spare parts). For pumps, delay of repair is allowed if: (1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system, and (2) repair is completed as soon as practicable, but not later than 6 months after the leak is detected.

The final standards also include design and operating requirements for closed-vent systems that may be used to comply with the equipment leak standards (§§ 264.1060 and 265.1060). Closed-vent systems must be designed for and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background by Reference Method 21. A leak on a closed-vent system, indicated by an instrument reading of 500 ppm or by visual inspection, must be repaired within 15 calendar days after detection; a first attempt at repair must be made no later than 5 calendar days after detection. Monitoring must be conducted initially, annually, and at other times as requested by the Regional Administrator, to confirm the no-detectable-emissions status of the system. Like other control devices, closed-vent systems must be operated at all times when any emissions may be vented to them.

The provisions of 40 CFR 61.244, subpart V, which provide a formal mechanism for applying for use of an alternative means of emission limitation, were specifically not included in the proposed TSDF process vent and equipment leak rules and have not been included in these final standards. The alternative means of emission limitation provisions are not considered self-implementing; i.e., these provisions cannot be satisfied without the need for detailed explanation or negotiation between the facility owner/operator and EPA, and thus are not appropriate as requirements for interim status facilities under part 265. Therefore, the alternative means of emission limitation provisions were not included in the final subpart AA and BB rules. An owner or operator, however, may use an alternative means of emission limitation to comply with the process vent or equipment leak standards of part 264. The owner/operator can use part B of the permit application to provide information that demonstrates the effectiveness of any alternative means of emission limitation and can use the negotiation process associated with issuance of a final permit to establish conditions for use of an alternative means of emission limitation. The owner or operator would be responsible for collecting and verifying test data to document that the emission reduction achieved by the alternative is equal to or greater than the emission reduction achieved by the equipment, design, or operational requirements in the standard.

Additional general recordkeeping requirements include information on pump, valve, compressor, and pressure relief device leak repair attempts; reasons for repair delays; and design criteria for sampling connection systems and closed-vent systems and control devices. There are also recordkeeping and monitoring requirements for pieces of equipment covered by alternative requirements.

Compliance with the equipment leak standards will be assessed through plant inspections and the review of records that document implementation of the requirements as required by the final standards.

D. Summary of Changes from Proposal

Several changes have been made to the standards since proposal as the result of EPA's evaluation of comments and of additional information gathered in response to comments. These changes respond primarily to commenters' concerns that additional controls are unnecessary for TSDF process vents and equipment with very low emissions and that the applicability, implementation, and compliance provisions of the standards should be clarified. The EPA has addressed these problems in the final rules.

The proposed standards would have required that organic emissions from all process vents that emit organics in concentrations of 10 percent or greater on all TSDF waste management units be reduced by 95 percent. The final rules apply to process vents on specific hazardous waste management units that treat wastes with total organics concentrations of 10 ppmw or greater and include (1) process vents on distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations and vents on condensers serving these operations and (2) process vents on tanks associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations if emissions from these process operations are vented through the tanks.

While the proposed standard would have required 95 percent emission reduction from each affected vent, the final vent standard's weight-percent reduction applies to total emissions from the combination of all affected vents at each facility. The final rules also add facility-based emission rate limits for all affected process vents of 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr) (§§ 264.1032(a)(1) and 265.1032(a)(1)). Facilities with organic emissions from vents below the emission rate limits will not have to reduce process vent organic emissions. The owner or operator of the facility must determine and document that emissions from affected vents will not exceed the emission rate limits. The EPA estimates that baseline emissions will be reduced by about 90 percent by controlling process vent emissions from about 55 percent of affected facilities, i.e., those with emissions above the emission rate limit.

Another major change affects the applicability of the final standards for pumps and valves to better relate to the volatility of the wastes managed and thus to air emission LDAR potential. The proposed LDAR requirements for pumps and valves have been revised to distinguish between equipment in heavy liquid service and equipment in gas/light liquid service. The provisions exempt pumps and valves processing relatively low vapor pressure substances (heavy liquids) from the routine instrument monitoring requirements of the standards. These provisions are included to avoid requiring unnecessary controls on equipment that poses little emission problem even when leaking.

Because of commenters' concerns with the administrative problems associated with obtaining a major permit modification, the final standards do not require modifications of RCRA permits issued before the effective date of these rules (§§ 264.1030(c) and 264.1050(c)). In such cases, requirements for affected hazardous waste management units and associated requirements for process vents and equipment must be added or incorporated into the facility's permit at review under § 270.50 or at reissue under § 124.15. However, in the forthcoming Phase II air rules, EPA will be proposing to modify §§ 264.1030(c) and 264.1050(c) as they apply to control of air emissions under subparts AA and BB. This action, if adopted, would mean that the air rules promulgated under RCRA section 3004(n) would be applicable to all facilities as of the effective date of the Phase II rules. More details regarding implementation are presented in section IX of this preamble.

The proposed air emission standards for process vents and equipment leaks would have added part 269, Air Emission Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. For consistency with standards for other TSDF sources under RCRA, the final standards have been incorporated into part 264, for permitted facilities, and part 265, for interim status facilities. In addition, whereas at proposal the equipment leak requirements of 40 CFR part 61, subpart V, were incorporated by reference, these provisions have been written into subpart BB with editorial revisions appropriate for a standard promulgated under RCRA authority rather than CAA authority.

E. Relationship of RCRA Exemptions to Final Standards

Under 40 CFR 261.4(c), hazardous wastes that are generated in process-related equipment such as product or raw material storage tanks or pipelines are exempt from RCRA regulation. This exemption applies until the waste is physically removed from the unit in which it was generated, unless the unit is a surface impoundment or unless the hazardous waste remains in the unit more than 90 days after the unit ceases to be operated for manufacturing, or for storage or transportation of product or raw materials. This exemption is not affected by this rule. Therefore, units such as *product* (not hazardous waste) distillation columns generating hazardous waste still bottoms containing organics are not subject to the standard while the wastes are in the product distillation column. However, distillation columns that receive hazardous wastes and that are used in hazardous waste treatment (i.e., hazardous waste management units) are subject to this standard if the waste's organic content exceeds the 10-ppmw applicability criterion. As discussed in the preamble to the proposed standard, only those recycling units that are part of a facility already subject to RCRA permit requirements are subject to the air standards. The EPA's authority to control air emissions from solvent reclamation operations not part of closed-loop systems is discussed further in section VI of this preamble and in the BID.

Totally enclosed treatment facilities also are exempt from RCRA subtitle C requirements under 40 CFR 264.1(g)(5), 40 CFR 265.1(c)(9), and 270.1(c)(2). A "totally enclosed treatment facility" is a hazardous waste treatment facility that is "directly connected to an industrial production process and which is constructed and operated in a manner that prevents the release of any hazardous waste or any constituent thereof into the environment during treatment" (40 CFR 260.10).

Treatment facilities located off the site of generation are not directly connected to an industrial process. Thus, commercial waste treatment facilities with equipment affected by the final standards, such as solvent reclamation facilities, by definition ordinarily would not be totally enclosed. In addition, storage facilities, disposal facilities, and ancillary equipment not used for treating hazardous waste do not fall within the definition of a totally enclosed treatment facility.

The EPA believes that many on-site treatment facilities also are not totally enclosed. Distillation columns and other treatment technologies typically are designed to release emissions into the air. Therefore, by definition, these on-site technologies generally are not totally enclosed. (See 45 FR 33218, May 19, 1980 (no constituents released to air during treatment).)

Two important characteristics define a totally enclosed treatment facility. The key characteristic of a totally enclosed treatment facility is that it does not release any hazardous waste or constituent of hazardous waste into the environment during treatment. Thus, if a facility leaks, spills, or discharges waste or waste constituents, or emits waste or waste constituents into the air during treatment, it is not a totally enclosed treatment facility within the meaning of these regulations. The second important characteristic is that it must be directly connected to an industrial production process.

The EPA also excludes elementary neutralization and wastewater treatment tanks as defined by 40 CFR 260.10 from regulation under the hazardous waste rules. The EPA amended these definitions (see 53 FR 34080, September 2, 1988) to clarify that the scope of the exemptions applies to the tank systems, not just the tank. For example, if a wastewater treatment or elementary neutralization unit is not subject to RCRA subtitle C hazardous waste management standards, neither is ancillary equipment connected to the exempted unit. The amendments also clarify that, for a wastewater treatment unit to be covered by the exemption, it must be part of an onsite wastewater treatment facility. Thus, emissions from process vents associated with distillation, fractionation thin-film evaporation, solvent extraction, or air or steam stripping operations and ancillary equipment (piping, pumps, etc.) that are associated with a tank that is part of the wastewater treatment system subject to regulation either under sections 402 or 307(b) of the Clean Water Act are not subject to these standards. However, air emission sources not subject to RCRA may be subject to CAA guidance and/or standards.

As noted in the preamble to the proposal, under 40 CFR 262.34, generators that accumulate hazardous waste in tanks and containers for 90 days or less are not subject to RCRA permitting requirements, provided they comply with the provisions of 40 CFR 262.34, which include the substantive requirements for tanks and containers storing hazardous waste, 40 CFR part 265, subparts I and J. This remains unchanged, and the final standards do not apply to generator tanks that accumulate hazardous waste for 90 days or less. However, as part of the Phase II TSDF air emission regulations, EPA intends to propose to modify the exemption conditions to require that 90-day tanks meet the control requirements of the Phase I and Phase II standards.

Today's final rules regulate the activity of reclamation at certain types of RCRA facilities for the first time. The EPA is amending 40 CFR 261.6 under its RCRA authority over reclamation to allow covering reclamation of hazardous wastes in waste management units affected by today's final rules. It should be recognized, however, that these final rules apply only at facilities otherwise needing a RCRA permit. In addition, the closed-loop reclamation exemption in § 261.4(a)(8) is not changed by these rules. Therefore, not all reclamation units will necessarily be affected by these rules.

VI. Summary of Comments and Responses

Numerous comments on the proposed rule were received that relate to nearly all aspects of the RCRA standards development process. The comment summaries cover topics relating to regulatory issues, applicability of the standards, control technologies impact analyses and implementation and compliance issues. Detailed responses to these and other comments are included in the BID for the promulgated standards, which is available in the public docket for this rule.

A. Regulatory Issues

Statutory Authority

Comment: Several commenters argued that TSDF air emissions should be regulated under the CAA rather than RCRA because (1) CAA standards under sections 111 and 112 are already in place in the SOCMI and petroleum refining industries; (2) air emissions at some TSDF have already been permitted under State implementation plans (SIP), new source review programs, or under State regulations for VOC or air toxics control; (3) VOC and ozone control are the province of the CAA, not RCRA; and (4) a statutory mechanism already exists under the CAA for evaluating the risk posed by air emissions.

Response: Congress has required EPA to promulgate air emission monitoring and control requirements at hazardous waste TSDF, under section 3004(n) of RCRA, as may be necessary to protect human health and the environment. Congress was aware of the existence and scope of the CAA when it enacted section 3004(n) of RCRA. There is no indication that Congress intended that all air regulations be issued within the confines of the CAA. On the contrary, when adding section 3004(n), Congress specifically recognized EPA's dual authority to regulate these air pollutants (S. Rep. 98-284, page 63).

The EPA has conducted an analysis of current State and Federal controls and concluded that further regulation under section 3004(n) is necessary to protect human health and the environment. The EPA examined State regulations, as well as existing Federal standards (and those under development), to determine the potential for overlapping rules and permitting requirements. The EPA found that 6 States have established air toxics programs, 21 States have established generic standards for VOC independent of Federal regulations, and several States have extended control techniques guidelines (CTG) for VOC to TSDF. However, the standards vary widely in scope and application and in many cases controls have not been required when emissions are below 40 ton/yr, even in the 37 States with ozone nonattainment areas. The EPA believes that today's action will help alleviate the nonuniformity among the States' efforts and will help achieve emission reductions necessary to protect human health and the environment.

A few commenters also argued that the standards would duplicate existing CAA standards that apply to the SOCMI and petroleum refineries. The EPA disagrees because the standards being promulgated today apply to waste management sources whereas the CAA standards previously promulgated apply to the production process.

The EPA also disagrees with contentions that it is outside the province of RCRA to address VOC and ozone. As noted, section 3004(n) standards, like all RCRA subtitle C standards, are to protect "human health and the environment." VOC and ozone are threats to human health and the environment and thus are well within the regulatory scope of section 3004(n).

Organic emissions from TSDF contribute to ambient ozone formation. In fact, TSDF are estimated to emit nearly 12 percent of all VOC from stationary sources, and thus any reductions in these emissions will contribute to reducing ozone formation and associated health and environmental problems.

RCRA Authority Over Recycling

Comment: Several commenters argued that EPA does not have regulatory authority under RCRA to control solvent reclamation operations or units or equipment managing materials destined for reclamation such as spent solvent because they are producing or managing products and not wastes.

Response: The EPA disagrees with the commenters regarding EPA's authority to control solvent reclamation operations. In response to a court opinion (*American Mining Congress* v. *EPA,* 824 F.2d 1177, DC Circuit Court of Appeals, July 31, 1987) concerning the scope of EPA's RCRA authority, EPA proposed amendments to the RCRA definition of "solid waste" that would clarify when reclamation operations can be considered to be managing solid and hazardous wastes (53 FR 519, January 8, 1988). The EPA has accepted comments on its interpretation and proposed amendments. The EPA has not yet taken final action on this proposal. Thus, EPA is addressing the scope of its authority over reclamation operations under RCRA in the context of that rulemaking. This rule is based on EPA's current interpretation of its RCRA authority, as described in the January 1988 proposal.

The following summarizes EPA's proposed position. In general, the proposed amendments would exclude from RCRA control only those spent solvents reclaimed as part of a continuous, ongoing manufacturing process where the material to be reclaimed is piped (or moved by a comparably closed means of conveyance) to a reclamation device, any storage preceding reclamation is in a tank, and the material is returned after being reclaimed, to the original process where it was generated. (Other conditions on this exclusion relate to duration and purpose of the reclamation process. See proposed § 261.4(a)(8).)

However, processes (or other types of recycling) involving an element of "discard" are (or can be) within RCRA subtitle C authority. When spent materials are being reclaimed, this element of discard can arise in two principal ways. First, when spent materials are reclaimed by someone other than the generator, normally in an off-site operation, the generator of the spent material is getting rid of the material and so is discarding it. In addition, the spent material itself, by definition, is used up and unfit for further direct use; the spent material must first be restored to a usable condition. This type of operation has been characterized by some of the worst environmental damage incidents involving recycling (50 FR 658-661, January 4, 1985). Moreover, storage preceding such reclamation has been subject to the part 264 and 265 standards since November 19, 1980. (See generally 53 FR 522 and underlying record materials.) The *American Mining Congress* opinion itself indicates that such materials are solid wastes (824 F.2d at 1187).

When a spent material is reclaimed on site in something other than a closed-loop process, EPA also considers that the spent material is discarded (i.e., spent solvents removed from the process, transferred to an on-site distillation unit, and regenerated have been removed from the production process). The EPA's reasoning is that these materials are no longer available for use in an ongoing process and have been disposed of from that operation, even if the reclamation operation is on site. Finally, EPA also considers that when hazardous secondary materials are reclaimed but then burned as fuels, the entire operation—culminating in thermal combustion—constitutes discarding via destructive combustion (53 FR 523). Consequently, under this reading, any intermediate reclamation step in these types of fuel production operations remains within EPA's subtitle C authority.

In summary, under EPA's current interpretation of the court's opinion, air emissions from distillation, fractionation, thin-film evaporation, solvent extraction, and stripping processes involving reclamation of spent solvent and other spent hazardous secondary materials can be regulated under RCRA subtitle C whenever the reclamation system is not part of the type of closed-loop reclamation system described in proposed part 261.4(a)(8). Any changes to this interpretation as part of the solid waste definition final rule may affect the scope of this rule.

Selection of Source Category

Comment: Several commenters disagreed with the selection of TSDF and Waste Solvent Treatment Facility (WSTF) process vents and equipment leaks for regulation because they believed that (1) out-of-date data or extrapolated data were used in the analysis and, as a result, the estimate of the number of affected facilities nationwide and the number affected by the proposed rule is far too low; (2) the role of State regulations was not considered; (3) EPA should control larger, more hazardous air emission sources at TSDF, such as storage tanks, before controlling process vents and equipment leaks; and (4) air emissions from waste solvent reclamation operations do not pose a health risk warranting control.

Response: The EPA generally disagrees with the commenters that the selection of TSDF process vents and equipment leaks was inappropriate. However, EPA agrees that the standards will affect more than the 100 WSTF estimated at proposal. To respond to these and other comments, EPA conducted additional technical analyses. The EPA developed an industry profile using results of the 1986 National Screening Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities (hereafter called the "Screener Survey"). The Screener Survey data represent all of the TSDF active in 1985 with interim status or final RCRA permits, which totalled about 3,000 facilities. The Screener Survey data are for operations in 1985, the latest year for which such comprehensive data are available. A review of the Screener Survey data shows a total of about 450 facilities that need authorization to operate under RCRA section 3005 and report solvent recovery by operations such as batch distillation, fractionation, thin-film evaporation, or steam stripping at the facility; i.e., operations that would have process vents subject to the standards. The EPA used these facility counts together with the reported 1985 waste solvent throughputs as the basis for the final process vent standards impacts analyses. In addition, EPA estimates that about 1,000 on site and off site permitted TSDF that do not practice solvent recovery do manage hazardous waste streams containing 10 percent or more total organics and would be subject to the equipment leak requirements. In total, about 1,400 facilities are potentially subject to the provisions of subpart BB.

State and Federal regulations also were reviewed to help EPA better estimate baseline emission control levels. Although a few States have controls in place, it appears that there are no general control requirements for TSDF process vents. Moreover, because TSDF with solvent recycling generally are small operations, any new waste management units with process vents would likely have potential VOC emissions of less than 40 ton/yr; thus, prevention of significant deterioration (PSD) permit requirements would not apply. In addition, EPA sent section 3007 information requests to several large and small TSDF; respondents to the EPA section 3007 questionnaires did not indicate control requirements for process vents. Several of the facilities that were asked to provide information reported requirements for obtaining air contaminant source operating permits, but they reported no permit requirements for controlling process vent emissions. Therefore, the revised emission estimates (that are based on site-specific emission data) should reasonably reflect the current level of control of process vent emissions.

With respect to those commenters who argued that other air emission sources should be controlled instead of process vents and equipment leaks, it should be pointed out that section 3004(n) of RCRA requires EPA to promulgate regulations for the monitoring and control of air emissions from hazardous waste TSDF, *including but not limited to* open tanks, surface impoundments, and landfills, as may be necessary to protect human health and the environment. Organic emissions are generated from process vents on distillation and separation units such as air strippers, steam strippers, thin-film evaporators, fractionation columns, batch distillation units, pot stills, and condensers and distillate receiving vessels that vent emissions from these units. Distillation and separation processes may be found in solvent reclamation operations, wastewater treatment systems, and in other pretreatment processes. Organic emissions also are released from equipment leaks associated with these processes as well as from nearly all other hazardous waste management units.

As discussed in section III.D of this preamble, the EPA chose to develop the process vent and equipment leak portion of its TSDF rulemaking as the first phase of the TSDF air emission rules partly to prevent uncontrolled air emissions from LDR treatment technologies since these technologies were likely to have increased use. In addition, EPA already had control technology information to support these regulations, and thus earlier development of these rules was possible. This is principally because effective controls now in place under the CAA to control emissions from the same types of emission points in chemical production facilities and petroleum refineries can be applied to reduce the health risk posed by air emissions from uncontrolled distillation, fractionation, thin-film evaporation, solvent extraction, and stripping processes and equipment leaks at TSDF. The EPA has limited the applicability of today's final standards to those types of process vents for which control techniques are well developed, i.e., those associated with processes designed to drive the organics from the waste, such as distillation, fractionation, thin-film evaporation, solvent extraction, and stripping operations.

Organic emissions also are generated from numerous other sources at TSDF. Preliminary estimates indicate that nationwide organic emissions (after control of process vents associated with distillation/separation units and equipment leaks) are about 1.8 million Mg/yr. The EPA is in the process of developing standards for these sources under section 3004(n) of RCRA, and the standards are scheduled for proposal in 1990. Source categories being examined include tanks, surface impoundments, containers, and miscellaneous units. These other TSDF source categories require different data and engineering evaluations; thus, standards for these other sources are on a separate rulemaking schedule. The emissions and risk analyses needed to support extension of the process vent standards to other closed (covered), vented tanks are also being developed in conjunction with this future rulemaking. These include vent emissions that are incidental to the process, such as emissions caused by loading or by agitation/ aeration of the waste in a treatment tank.

The EPA has determined that organic emissions from TSDF/WSTF process vents and equipment leaks pose a significant risk to human health and the environment and that section 3004(n) provides authority to control TSDF air emissions from these sources. Therefore, EPA has decided to take measures to reduce the atmospheric release of organic air pollutants from these sources as quickly as possible. The fact that distillation, fractionation, thin-film evaporation, solvent extraction, and stripping processes and equipment leaks are regulated before other sources is not germane. There is no reason to delay these rules while others are under development.

Other commenters criticized the selection of the source category for regulation because their process vent emissions either are already controlled or are low enough so as not to pose a threat to human health and the environment. However, EPA's analysis of process vent emissions and impacts indicates that for a large segment of the industry, TSDF process vent emissions can pose significant environmental and health risks. These facilities are the target of the subpart AA process vent standards. As discussed in section VI.B of this preamble, the final standards include facility process vent emission rate limits designed to avoid control of facilities where meaningful reductions in nationwide risk to human health and the environment cannot be achieved.

Several commenters also criticized the source category for regulation because emissions from generators who conduct on-site reclamation and off-site reclaimers with no prior storage (i.e., those recycling activities conducted at facilities not requiring a RCRA permit) would not be controlled.

The standards being promulgated today (under section 3004(n)) apply only to waste management facilities that need authorization to operate under section 3005 of RCRA. Air emissions from subtitle C waste management facilities that are excluded from RCRA permit requirements will be subject to regulation under either the CAA or RCRA authority as appropriate. Waste management facilities that fall under the requirements of subtitle D (i.e., nonhazardous waste operations) will also be subject to regulation under the CAA. The EPA limited the scope of the standards at proposal and in this final rule to facilities required to have a permit under RCRA to minimize disruption to the current permitting system (i.e., not expand the permit universe) and not impose a permit burden on facilities not otherwise subject to RCRA permits. Although EPA is controlling only some sources in this rule, other sources of significant levels of air emissions will also be controlled; i.e., it is a matter of timing rather than a decision not to control these other sources. This phased regulatory approach is discussed in section III.C of this preamble.

RCRA Decision Criteria

Comment: Several commenters alleged that the standards do not meet the mandate of RCRA section 3004(n) because (1) the standards are not protective in all cases; (2) the standards are inconsistent with RCRA section 3004(m) that requires treatment standards based on best demonstrated available technology (BDAT); and (3) neither the RCRA statute nor its legislative history allows consideration of costs.

Response: The EPA believes that the standards promulgated today appreciably reduce health risks that are presented by air emissions at TSDF and provide protection to human health and the environment as required by section 3004(n) of RCRA, for the vast majority of the air emissions affected by these standards. The EPA's analysis of residual cancer risk after implementation of the standards for process vents indicates that maximum individual risk, even at the upper-bound emission rate, is well within the residual risk for other standards promulgated under RCRA, which historically has been in the range of 1×10^{-4} to 1×10^{-6}. On the other hand, the analysis indicates that residual cancer risk after implementing the equipment leak standards is higher than the residual risk for other standards promulgated under RCRA. However, EPA believes that the equipment leak standards achieve significant reductions in emissions and risk and, that after control, the vast majority of facilities are well within the risk range of other RCRA standards.

As was already described, EPA will be promulgating regulations to control TSDF air emissions in phases. Thus, in Phase III, EPA will be evaluating the need for additional control (e.g., control of individual toxic constituents after implementation of these standards) for cases where the risk from air emissions after implementation of the Phase I and II standards is higher than desirable. (This regulatory approach is discussed in section III.C of this preamble.) During the interim, permit writers should use EPA's omnibus permitting authority to require more stringent controls at facilities where a high residual risk remains after implementation of the standards for volatile organics. The permitting authority cited by section 3005 of RCRA and codified in § 270.32(b)(2) states that permits "* * * shall contain such terms and conditions as the Administrator or State Director determines necessary to protect human health and the environment." This section allows permit writers to require emission controls that are more stringent than those specified by a standard.

As has been described above, the approach that EPA is using to control TSDF air emissions is to proceed with promulgation of regulations to control organic emissions as a class (Phases I and II) and to follow this with regulations that would require more stringent controls for cases where the risk after implementing the organic standards remains high. The EPA believes that this approach will ultimately be protective of human health and the environment for all TSDF air emissions on a nationwide basis.

The question of whether these standards implement the requirements of RCRA section 3004(m) is irrelevant. Regulations implementing section 3004(m), which is a pretreatment-based program that defines when hazardous wastes can be land-disposed, have been (and will continue to be) separately promulgated by EPA. For example, see 40 FR 268 (November 7, 1986) and 52 FR 25787 (July 8, 1987). In contrast, today's regulations under section 3004(n) of RCRA do not specify technology-based treatment levels for hazardous wastes but regulate air emissions from treatment units as necessary to protect human health and the environment. Therefore, in developing today's rule EPA has focused on achieving acceptable levels of health and environmental protection rather than on specifying pretreatment levels for hazardous wastes. The two regulatory efforts (i.e., 3004(m) and 3004(n) rules) are integrated and coordinated to the extent possible to reduce duplicate and conflicting regulations. Furthermore, today's rules are designed to ensure that treatment required under 3004(m) is protective of human health and the environment.

The role of costs as a decision criterion under RCRA in subtitle C is not explicitly addressed in the statute. The EPA's position is that it can consider cost information as a basis for choosing among alternatives either (1) when they all achieve protection of human health and the environment or (2) for alternatives that are estimated to provide substantial reductions in human health and environmental risks but do not achieve the historically acceptable levels of protection under RCRA, when they are equally protective. However, EPA does not believe that the cost burden on industry is a basis for reducing the stringency of standards EPA considers necessary to protect human health and the environment.

Total Organics Approach

Comment: Commenters argued that applicability should be limited to known or suspected carcinogens. In addition, several commenters argued that applicability of the standards should be based on volatility and not on total organic content because the relative amount of organic content by weight does not determine potential air emissions and subsequent health effects.

Response: First, it should be pointed out that ozone presents a threat to human health and the environment that warrants control under RCRA. The EPA agrees that total organic content may not be a completely accurate gauge of potential environmental (e.g., ozone) or health (e.g., cancer) impacts for a source such as process vents, but it is a readily measurable indicator. In addition, the final rule's substantive control requirements do apply only to vents and equipment containing volatile components.

The final vent standard applies to certain process vents emitting organics if the vent is associated with one of the processes specified in the rule. A process vent is determined to be affected by the standard if the vent is part of a hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping unit that manages wastes with 10 ppmw or more total organics; this includes vents on tanks (e.g., distillate receivers or hot wells) if emissions from the process operations are vented through the tank. Total organic content of the vent stream (i.e., the emissions to the atmosphere) is not a consideration in determining process vent applicability. As public commenters pointed out, the 10-percent total organics concentration cutoff for the vent stream does not limit total emissions or relate to emissions that escape capture by existing control devices and therefore was not included in the final rules.

Furthermore, the process vents covered by this rule are typically associated with distillation/separation processes used to recycle spent solvents and other organic chemicals. By definition, distillation is a process that consists of driving gas or vapor from liquids or solids by heating and then condensing the vapor(s) to liquid products. Wastes treated by distillation are expected to contain organics that are driven off in the process. Thus, by their nature, process vent emissions contain volatile organics.

Under the final standards, the term "organic emissions" is used in lieu of "volatile organic emissions" to avoid confusion with "volatile organic compounds." As at proposal, the final rule applies to total organics. Because of the hundreds of hazardous constituents that could be contained in and contacted by the equipment covered by today's rules, EPA recognizes the potential for the residual risk at some facilities to remain higher than the residual risk for other standards promulgated under RCRA. Regulations based only on specific constituents will therefore be developed, as necessary, in Phase III of EPA's regulatory approach. The constituents to be evaluated will include those reported as being present in hazardous wastes managed by existing TSDF for which health effects have been established through the development of unit risk factors for carcinogens and reference doses for noncarcinogens.

As is discussed in section VI.B of this preamble, emission potential from equipment leaks also was considered by incorporating the light-liquid definition in the section 111 CAA standards. Light liquids exhibit much higher volatilities than do heavy liquids, which are relatively nonvolatile. Equipment leak rates and emissions have been shown to vary with stream volatility; emissions from heavy liquids are far less than those for lighter, more volatile streams. For example, EPA analyses indicate that emissions from valves in heavy-liquid service are more than 30 times lower than the emissions from valves in light-liquid service (see the BID, § 4.6). The EPA examined the emissions and risk associated with light- and heavy-liquid waste streams and found that light-liquid streams are the overwhelming contributors to both emissions and risk. Thus, the final standards take into account the volatility of emissions and the subsequent impact on health and the environment.

Application of CAA Equipment Leak Standards

Comment: Several commenters did not agree that the standards should be based on the transfer of technology from the section 112 standards for benzene (40 CFR, subpart V) because TSDF waste streams and processes differ from the chemical plants and petroleum refineries upon which the CAA standards are based.

Response: Data used in establishing the benzene fugitive standards under CAA section 112 are based on extensive emission and process data collected at a variety of petroleum refinery and SOCMI operating units. Data were obtained for equipment and chemical component mixtures that include many of the same organic compounds that are treated, stored, and disposed of in hazardous waste management units. Because hazardous waste management units such as distillation units have the same sources of fugitive organic emissions (such as pumps and valves) and handle the same chemicals as do chemical manufacturing plants and petroleum refineries, it is reasonable to expect similar performance and efficiency of the technology for controlling organic emissions at hazardous waste management units. The EPA has no reason to believe that the equipment standards would not be applicable to TSDF. Moreover, although EPA has not conducted actual equipment leak testing at TSDF, observations of equipment during plant visits have confirmed that the assumptions and analyses used in other equipment leak standards apply to TSDF as well.

Changes have been made in the final standards and analyses to incorporate provisions included in the CAA standards that reflect the effect of volatility on emissions. As is discussed in section V of this preamble, the LDAR requirements for pumps and valves have been revised to include the light-liquid provisions in EPA's NSPS for VOC equipment leaks in the SOCMI. Correspondingly, the emission and health risk analyses have been revised to reflect this change to the standards. Additional information on the appropriateness of the CAA data on the SOCMI and petroleum refineries is presented in the next section.

B. Standards and Applicability

Standards for Accumulator Vessels

Comment: Commenters contended that the regulatory approach of applying a single standard to the wide varieties of accumulator vessels irrespective of the chemical constituents that are present and the size of the vessel is not appropriate because the proposed standards result in the control of already low emission rates at disproportionately high costs. Standards for tanks (whether accumulation or storage tanks) should be conditioned by the size of the vessel, the vapor pressure of the material being stored, and the type of units that pose a risk to human health and the environment. The EPA's approach should be similar to or consistent with the CAA NSPS for petroleum liquid storage vessels (40 CFR part 60, subpart Ka). These standards exempt vessels that store liquids less than 1.5 psia or that store less than 40,000 gal.

Response: Commenters recommending that the air emission standards be conditioned by the size of the tank and the vapor pressure of the material being stored have misinterpreted the applicability of the proposed standards. To clarify the applicability of the standards, the term "product accumulator vessel" has been dropped from the promulgated rule, including the equipment definition, and the process vent definition has been revised to be specific to the applicable emission sources. "Process vent" is defined to mean "any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with distillation fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations." Similarly, the definition of "vented" has been revised to specifically exclude the passage of liquids, gases, or fumes "caused by tank loading and unloading (working losses)." Because tank working and breathing losses are not considered process emissions, the comments concerning vapor pressure and tank size exemptions are not relevant. (It should be noted, however, that EPA intends to regulate hazardous waste storage tanks, along with various other TSDF air emission sources in the Phase II, section 3004(n), TSDF air standards now being developed and evaluated by the Agency.)

In conducting the impact analysis of the WSTF/TSDF process vent standards, EPA considered and took into account the relative size of WSTF process units and the wide range of chemicals processed in the WSTF industry. For example, three sizes of WSTF model units were defined for analysis of emissions, health risks, and economic impacts in the final rulemaking (see section VI.D). In addition, the final standards for process vents promulgated by EPA contain emission rate limits and require controls only at facilities whose total process vent emissions are greater than 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr). More detailed descriptions of the model units and the process vent emission rate limits are provided in chapters 5.0 and 7.0, respectively, of the BID.

Comment: Several commenters objected to the proposed standard for process vents that requires a fixed 95-percent emission reduction. They believe that the process vent standard is inequitable because some operations could reduce emissions by 95 percent and still have higher emissions than some small uncontrolled operations and because facilities would have to install control devices on all condenser and still vents regardless of emissions or risk posed to human health or the environment. A few commenters asked EPA to consider exemptions for small solvent operations that have low emissions and thus pose little health risk.

Response: In response to these comments, EPA estimated the TSDF/WSTF air quality and health impacts using updated model unit, emission rate, and facility throughput data. Although total facility waste solvent throughputs were available, the data base did not contain any information on the number or capacities of process units at each site. Therefore, the risk analysis is based on overall facility operations and total facility process vent emissions as opposed to individual process vent emissions. The impacts analysis results show that nationwide reductions in emissions, maximum individual risk (MIR), and cancer incidence level off (i.e., yield only insubstantial incremental reductions) at a facility emission rate of about 2.8 Mg/yr (3.1 ton/yr). At a typical rate of 2,080 h/yr of operation, this annual emission rate corresponds to 1.4 kg/h (3 lb/h) of organic emissions. Control of facilities with process vent emissions less than these values does not result in further reductions of nationwide MIR or cancer incidence. At this emission level, larger facilities (i.e., those with uncontrolled emissions above the emission rate limit) that are controlled to a 95-percent emission reduction result in MIR values higher than the remaining uncontrolled small facilities (i.e., those with uncontrolled emissions below the limit). The same holds true for nationwide cancer incidence. The reduction in cancer incidence achieved by controlling facilities below the limit is not significant relative to the nationwide reductions achieved by controlling the larger facilities.

Consequently, the analysis results indicate that provision of small facility emission rate limits of 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr) for process vent emissions provides essentially the same level of protection for human health and the environment (in terms of risk, incidence, and emissions) as does covering all facilities. In addition, the MIR after control is within the range of residual risk for other standards promulgated under RCRA. As a result, the final rule requires control of only those facilities emitting greater than 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr) organic emissions from all process vents. A more detailed discussion of the process vent emission rate limits is contained in chapter 7.0 of the BID.

Because the final standards contain process vent emission rate limits, it is anticipated that small solvent recovery operations would not be substantially affected by the final process vent standards. The EPA estimates, based on the high emission rates and 1985 waste solvent throughput data, indicate that about 45 percent of the WSTF identified in the industry profile will have process vent emissions of less than 2.8 Mg/yr (3.1 ton/yr). Consequently, it is expected that a large number of small facilities would not be required to install additional process vent controls.

Selection of 10-Percent Cutoff

Comment: Commenters believed that the 10-percent level proposed is comparable to 100,000 ppm and may be too high, particularly when compared to the 10,000-ppm level that defines an equipment leak, and that EPA should evaluate the health and environmental impacts associated with the proposed limit. The 10-percent limit will allow excessive emissions from leaking equipment and is based on costs, not technical limitations. Commenters also argued that the 10-percent limit does not adequately protect the environment because emissions could be substantial if there are numerous leaking components with relatively dilute streams and that controls, such as carbon adsorbers, are available to capture emissions from dilute streams.

Response: First, for clarification, the 10-percent organic content limit for equipment leaks in no way relates to the 10,000-ppm leak definition. The leak definition, which is a Method 21 instrument reading used to define when a leak is detected, is discussed in a later comment. As proposed, the 10-percent total organics cutoff level for applicability of the standards covered both equipment leak (fugitive) emissions and process vent emissions. Control technologies for fugitive emissions comprise the use of control equipment, inspection of equipment, and repair programs to limit or reduce emissions from leaking equipment. These control technologies have been studied and evaluated for equipment containing fluids with more than 10 percent organics (EPA–450/3–80–32b, EPA–450/3–80–33b, EPA–450/3–82–010, and EPA–450/3–86–002). The 10-percent criterion was chosen in EPA's original benzene/SOCMI studies to focus the analyses on air emissions from equipment containing relatively concentrated organics and presumably having the greatest potential for air emissions. Available data from the original benzene/SOCMI studies do not suggest that fugitive emissions from leaking equipment (e.g., pumps and valves) handling streams containing less than 10 percent organics are significant or that the 10-percent cutoff allows excessive emissions from dilute streams

However, to reevaluate this would require several years to conduct field studies to collect and analyze additional emissions and control effectiveness data for equipment leaks. Because available data support the need for, and effectiveness of, standards for equipment handling streams containing at least 10 percent organics, the EPA does not believe that a delay in rulemaking to assess emissions and controls for equipment handling streams containing less than 10 percent organics is warranted.

The effectiveness of fugitive emission control technologies has been thoroughly evaluated for equipment containing fluids with at least 10 percent organics, and fugitive emission standards have been proposed or established under both sections 111 and 112 of the CAA. (See 46 FR 1136, January 5, 1981; 46 FR 1165, January 5, 1981; 48 FR 279, January 4, 1983; 48 FR 37598, August 18, 1983; 48 FR 48328, October 18, 1983; 49 FR 22598, May 30, 1984; 49 FR 23498, June 6, 1984; and 49 FR 23522, June 6, 1984.) As elaborated in these rulemakings, a 10-percent cutoff deals with the air emissions from equipment most likely to cause significant human health and environmental harm.

With regard to process vent emissions, EPA agrees with the commenter. Emission test data show that the 10-percent cutoff potentially may allow significant emissions from process vents on a mass-per-unit-time basis (e.g., kg per hour or Mg per yr). As public commenters pointed out, the 10-percent cutoff for process vents does not limit total emissions, nor does it relate to emissions that escape capture by existing control devices. Therefore the 10-percent cutoff may not be appropriate; as a result, EPA has eliminated the 10-percent cutoff as it applies to process vents. The EPA believes that an emission rate limit more effectively relates to emissions, emission potential, and health risks than does a 10-percent organic concentration cutoff. Accordingly, a health-risk-based facility process vent emission rate limit has been added to the final rules in lieu of the 10-percent cutoff.

Because the emission rate limits (3 lb/h and 3.1 ton/yr) provide health-based limits, EPA considered dropping completely the organic content criterion (i.e., at least 10 percent total organics). However, EPA decided not to eliminate completely the organic content criterion because it is not clear that the same controls can be applied to very low concentration streams as can be applied to the higher concentration streams that generally are associated with emission rates greater than the limits. For low-concentration streams, EPA questions whether controls are needed on a national or generic basis, but is unable to resolve this question at this time. Thus, EPA decided to defer controlling very low concentration streams until it is able to better characterize and assess these streams and the appropriate controls.

Once EPA decided to consider facilities that manage very low concentration organic wastes as a separate category, there remained the problem of determining the appropriate criterion. The EPA examined existing data on air strippers, the treatment device most commonly used with low-concentration streams; it appeared that the quantity of emissions and the risk associated with air strippers treating streams with concentrations below 10 ppmw may be relatively small, thus minimizing the potential harm of deferring control until a later time. Examples of facilities managing low-concentration wastes are sites where ground water is undergoing remedial action under CERCLA or corrective action pursuant to RCRA. Based on the limited set of precise data available, and the comments that the 10-percent criterion was too high, EPA determined that an appropriate criterion would be 10 ppm total organics in the waste by weight.

The 10-ppmw criterion is not an exemption from regulation; it is intended only as a way for EPA to divide the air regulations into phases. The EPA is deferring action on very low concentration streams (i.e., ones with less than 10 ppmw total organic content) from the final rule today but will evaluate and announce a decision later on whether to regulate these waste streams.

Exemptions

Comment: Several commenters disagreed with EPA's interpretation that the definition of "totally enclosed treatment units" (which are exempt from regulation) may in certain circumstances include on-site treatment units that use engineered controls to prevent the release of emissions. One commenter stated that on-site treatment facilities directly tied with process equipment have the same potential for emissions as do other sources not exempted by the proposed regulation.

Response: This rule does not create or modify any exemption for totally enclosed treatment facilities; rather, the existing definition of an exemption for totally enclosed treatment facilities remains in effect, and existing regulatory interpretations remain in effect as well. Although the preamble to the proposed rule repeated the existing definition, it also contained a request for comments on an interpretation of the totally enclosed facility exemption whereby the "use of effective controls such as those required by the proposed standards" would meet the criteria of 40 CFR 260.10. Upon consideration of the comments, EPA has determined that this interpretation would have conflicted with the regulatory definition and previous interpretations of the exemption and, therefore, has decided to withdraw it.

As presented in the preamble to the proposed rule, under 40 CFR 264.1(g)(5) and 40 CFR 265.1(c)(9), totally enclosed treatment facilities are exempt from RCRA regulation. A "totally enclosed treatment facility" is a facility treating hazardous waste that is "directly connected to an industrial production process and which is constructed and operated in a manner which prevents the release of any hazardous waste or constituent thereof into the environment during treatment" (40 CFR 260.10). Therefore, as stated in the proposal preamble, process equipment designed to release air emissions are not "totally enclosed."

The EPA agrees with the commenter that on-site treatment facilities associated with process equipment generally are designed to release air emissions and, thus, are not "totally enclosed." The EPA specifically stated this in the preamble to the proposed rule. To be considered "totally enclosed," units must meet the test of preventing the release of any hazardous constituent from the unit not only on a routine basis but also during a process upset. Thus, the risks from these units are expected to be less than from units that are not totally enclosed.

Comment: Commenters stated that the exemption for tanks storing or treating hazardous wastes that are emptied every 90 days and that meet the tank standards of 40 CFR 262.34 is not justified based on risk, as RCRA requires. The exclusion of less-than-90-day storage tanks from air emission control requirements will increase the use of the 90-day storage exemption and the resultant air emissions.

Response: In 40 CFR part 270, hazardous waste generators who accumulate waste on site in containers or tanks for less than the time periods provided in § 262.34 are specifically excluded from RCRA permitting requirements. To qualify for the exclusions in § 262.34, generators who accumulate hazardous waste on site for up to 90 days must comply with 40 CFR

265, subpart I or J (depending on whether the waste is accumulated in containers or tanks) and with other requirements specified in § 262.34. Small-quantity generators (i.e., generators who generate more than 100 kilograms but less than 1,000 kilograms per calendar month) are allowed to accumulate waste on site for up to 180 days or, if they must ship wasteoff site for a distance of 200 miles or more, and if they meet certain other requirements set out in § 262.34, for up to 270 days.

The promulgated regulation does not create a new exemption for 90-day accumulation, nor does it modify the existing regulation. As the commenter notes, EPA is considering what changes (if any) should be made to § 262.34 (the "90-day rule") under a separate rulemaking (51 FR 25487, July 14, 1986). As part of that effort, EPA currently is evaluating whether air emissions from these and other accumulator tanks, mentioned above, at the generator site should be subject to additional control requirements. Preliminary analysis indicates that 90-day tanks and containers may have significant organic air emissions; consequently, as part of the second phase of TSDF air emission regulations, EPA is considering proposing to modify the exemption to require that 90-day tanks meet the control requirements of the Phase I and II standards. (The multiphased standards development approach for regulating organic air emissions is discussed in section III.C of this preamble.) Until a final decision is made on regulating the emissions from these units, they will not be subject to additional controls. However, EPA does not believe that more generators will use the 90-day exemption if air emission controls are not imposed on these units. Those generators who are eligible for inclusion under § 262.34 are probably already taking advantage of the provision now by storing their hazardous wastes for less than 90 days.

LDAR Program

Comment: Several commenters criticized the incorporation of the national emission standard for hazardous air pollutants (NESHAP) for benzene because of differences in scope from the SOCMI NSPS in that (1) the NSPS distinguishes between light and heavy liquids and the proposed standards based on the benzene NESHAP do not; (2) the NSPS does not require testing of all SOCMI units because process fluid vapor pressure is the overriding consideration in predicting leak frequencies and leak rates (the proposed standards incorporating the NESHAP do not recognize vapor pressure and require testing of all SOCMI units); and (3) the NSPS exempts facilities from routine fugitive emission monitoring, inspection, and repair provisions if a heavy-liquid product from a heavy-liquid raw material is produced and limits monitoring of equipment in heavy-liquid service only to where there is evidence of a potential leak.

Response: The EPA agrees with the commenters that the provisions for light and heavy liquids in the SOCMI NSPS should be incorporated in the section 3004(n) standards, even though the subpart V NESHAP does not contain the distinction. No distinction was made for the benzene NESHAP because benzene is a light liquid. By their nature, heavy liquids exhibit much lower volatilities than do light liquids and because equipment leak emissions have been shown to vary with stream volatility, emissions for heavy liquids are less than those for lighter and more volatile ones. As previously noted, EPA analyses have determined that the emission rate for a valve in heavy-liquid service is more than 30 times less than the emission rate for a valve in light-liquid service. In response to these comments, EPA examined the emission and risk associated with light- and heavy-liquid waste streams and found that light-liquid streams are the overwhelming contributors to both emissions and risk. Therefore, a routine LDAR monthly inspection is not necessary for heavy liquids.

Thus, the final regulations have been changed to incorporate the light/heavy-liquid service provisions for pumps and valves (40 CFR parts 264 and 265, subpart BB, §§ 264.1052, 264.1057 265.1052, and 265.1057). Equipment is in light-liquid service if the vapor pressure of one or more of the components is greater than 0.3 kPa at 20 °C, if the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight, and if the fluid is a liquid at operating conditions. The 0.3-kPa vapor pressure criterion is based on fugitive emission data gathered in various EPA and industry studies (EPA–450/3–82–010). Equipment processing organic liquids with vapor pressures above 0.3 kPa leaked at significantly higher rates and frequencies than did equipment processing streams with vapor pressures below 0.3 kPa. Therefore, EPA elected to exempt equipment processing lower vapor pressure substances (i.e., heavy liquids) from the routine LDAR requirements of the standards. In addition, monitoring of equipment in heavy-liquid service is required only where there is evidence by visual audible olfactory, or any other detection method of a potential leak.

Comment: Several commenters asked EPA to consider exemptions from fugitive emission monitoring for small facilities based on volume (as was done in the benzene NESHAP and the SOCMI NSPS), emission threshold, product applicability threshold or equipment component count, or equipment size. In support, the commenters pointed to similar exemptions in the CAA rules that were in the proposed standards.

Response: The commenters suggest that EPA consider other exemptions for fugitive emission monitoring that are applied in the benzene NESHAP or SOCMI NSPS (e.g., small facilities with the design capacity to produce less than 1,000 Mg/yr). The EPA recognizes that estimated emissions and health risks from small facilities should be considered in the final rules. With regard to the SOCMI NSPS small-facility exemption, the cutoff was based on a cost-effectiveness analysis. Under section 111 of the CAA, EPA may exempt units where costs of the standards are unreasonably high in comparison to the emission reduction achievable. Under RCRA, the statutory criterion is protection of human health and the environment. Therefore, any cutoff for RCRA standards must be risk-based. Cost effectiveness is only a relevant factor for choosing among alternatives either (1) when they all achieve protection of human health and the environment or (2) for alternatives that are estimated to provide substantial reductions in human health and environmental risks but do not achieve the historically acceptable levels of protection under RCRA, when they are equally protective.

In the benzene NESHAP (49 FR 23498, June 6, 1984), EPA concluded that control of units producing less than 1,000 Mg/yr did not warrant control based on the small health-risk potential. The benzene standards, however, did not have to deal with the many different pollutants covered by the TSDF process vent and equipment leak standards, some of which are much more carcinogenic than benzene. In addition to unit size (or throughput), fugitive emissions are also a function of the chemical characteristics of the hazardous wastes being handled.

Typically, TSDF have a variety of hazardous waste management processes (e.g., container storage, tank storage, treatment tanks, incinerators, injection wells, and terminal loading operations) located at the same facility, all of which have associated pumps, valves, sampling connections, etc., and therefore, fugitive emissions from equipment leaks. Also, several different types of hazardous waste typically are managed at a facility. Because of the various factors affecting facility fugitive emissions from equipment leaks (e.g., equipment leak emissions are a function of component counts rather than waste throughput), it would be very difficult to determine a small-facility exemption based on risk but expressed as volume throughput. For these reasons, EPA did not include exemptions for fugitive emission monitoring such as those applied in the benzene NESHAP or SOCMI NSPS (i.e., small process units with the design capacity to produce less than 1,000 Mg/yr).

Comment: Commenters stated that the TSDF fugitive emission standards should conform to the benzene NESHAP, which allows exemptions for vacuum systems, systems with no emissions, and systems whose leakage rate is demonstrated to be below 2 percent.

Response: The EPA has included in the final TSDF standards (§§ 264.1050 and 265.1050) the exemption for equipment "in vacuum service" found in the benzene NESHAP (40 CFR part 61, subpart V, 61.242–1). Also included are the identification requirements contained in the regulation. "In vacuum service" means that equipment is operating at an internal pressure that is at least 5 kPa below ambient pressure. The EPA has concluded that it is unnecessary to cover equipment "in vacuum service" because such equipment has little if any potential for emissions and, therefore, does not pose a threat to human health and the environment. Accordingly, this equipment has been excluded from the equipment leak fugitive emission requirements.

The proposed standards stated that owners and operators of facilities subject to the provisions of the rule must comply with the requirements of 40 CFR part 61, subpart V (equipment leak standards for hazardous air pollutants), except as provided in the rule itself. The provisions of the proposed rule did not exclude §§ 61.243–1 and 61.243–2 (alternative standards for valves in VHAP service), and the alternative standards have been incorporated as §§ 264.1061, 264.1062, 265.1061, and 265.1062 of the final rule. Therefore, an owner or operator may elect to have all valves within a TSDF hazardous waste management unit comply with an alternative standard that allows a percentage of valves leaking of equal to or less than 2 percent (§§ 264.1061 and 265.1061), or may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of §§ 264.1062 and 265.1062.

Comment: One commenter suggested that releases from pressure relief devices in gas service should be directed to control equipment at least equal in performance to those for other process sources or an alternative means provided to prevent an uncontrolled discharge. According to the commenter, rupture discs or closed-vent systems restrict small leaks but not major releases; a closed-vent system connected to a control device is needed to capture releases. The commenter concluded that EPA has provided no data to support exempting flanges and pressure relief devices in liquid service from LDAR requirements and should not rely on operators to see, hear or smell leaks from this equipment.

Response: Pressure relief devices allow the release of vapors or liquids until system pressure is reduced to the normal operating level. The standards are geared toward control of routine low-level equipment leaks that may occur independently of emergency discharges. Pressure relief discharges are an entirely different source of emissions than equipment leaks or process vents and were not covered in the original equipment leak standards under the CAA. The new subpart BB rules require that pressure relief devices in gas service be tested annually by Method 21 (and within 5 days of any relief discharge) to ensure that the device is maintained at no detectable emissions by means of a rupture disc. In addition, because a pressure discharge constitutes a process upset that in many cases can lead to hazardous waste management unit downtime and might also pose a risk to workers, a facility has the incentive to minimize the occurrence of these events.

The frequency, duration, and air emissions associated with such emergency discharges at TSDF waste management units currently cannot be estimated with any certainty on a nationwide basis. However, if a pressure discharge does occur, records and reports (maintained at the site under §§ 264.1054, 264.1064, 265.1054, and 265.1064 of subpart BB) will indicate the frequency of such discharges, the estimated volume of excess emissions and other relevant information. If pressure discharges appear to be a problem at any facility the RCRA permitting system provides State or EPA permit writers the flexibility to require closed-vent systems for these discharges on a site-specific basis.

The LDAR program transferred from the CAA standards does not exempt pressure relief devices in light liquid or heavy liquid service and flanges, but requires formal monitoring of these sources if operators see, smell, or hear discharges. The EPA considers that this is the most practical way to manage these sources. Although scheduled routine maintenance may be a way of avoiding the need for formal monitoring, it may not be a successful method for all sites in eliminating leaks due to the numerous variables affecting leak occurrence. For example, flanges may become fugitive emission sources when leakage occurs due to improperly chosen gaskets, poorly assembled flanges, or thermal stress resulting in the deformation of the seal between the flange faces. In these situations, operators will be able to detect such leaks by sight, smell, or sound. Support for this approach was presented and evaluated in developing several CAA rulemakings (EPA–450/3–83–016b, EPA–450/3–80–033b, and EPA–450/3–81–015b).

Comment: One commenter stated that the LDAR program should require preventive maintenance, such as the periodic replacement of valve packings, before waiting for the valve to fail. In support, the commenter argued that EPA's own data show that directed maintenance could reduce leaks from valves to below 10,000 ppm. The commenter also criticized the 10,000-ppm leak definition as being too high and states that EPA must consider the level in terms of the health effects.

Response: The key criterion for selecting a leak definition is the overall mass emission reduction demonstrated to be achievable. The EPA has not concluded that an effective lower leak definition has been demonstrated. Most data developed for current CAA standards (EPA–450/3–82–010) on leak repair effectiveness have applied 10,000 ppm as the leak definition and therefore do not indicate the effectiveness of repair for leak definitions between 1,000 and 10,000 ppm. Even though limited data between these values were collected for support of CAA standards, they are not sufficient to support a leak definition below 10,000 ppm. Data are insufficient to determine at what screening value maintenance efforts begin to result in increased emissions.

As the commenter noted, although there is some evidence that directed maintenance is more effective, available data are insufficient to serve as a basis for requiring directed maintenance for all sources.

(**Note:** In "directed maintenance" efforts, the tightening of the packing is monitored simultaneously and is continued only to the extent that it reduces emissions. In contrast, "undirected" repair means repairs such as tightening valve packings without simultaneously monitoring the result to determine whether the repair is increasing or decreasing emissions.)

The EPA's rationale for selecting the 10,000-ppmv leak definition and for not requiring directed maintenance under the CAA LDAR program also has been discussed in the proposal and promulgation BIDs for benzene emissions from coke by-product recovery plants (EPA-450/3-83-016 a and b), for SOCMI fugitive emissions (EPA-450/3-80-033 a and b), for petroleum refinery fugitive emissions (EPA-450/3-81-015 a and b), and for benzene fugitive emissions (EPA-450/3-80-032 a and b). (See also the "Response to Public Comments on EPA's Listing of Benzene Under section 112" (EPA-450/5-82-003) "Fugitive Emission Sources of Organic Compounds—Additional Information on Emissions, Emission Reductions, and Costs" (EPA-450/3-82-010), and EPA's "Response to Petition for Reconsideration" (50 FR 34144, August 23, 1985).)

The commenter also criticizes EPA for not reanalyzing the health effects of the 10,000-ppmv level before applying the limit to TSDF under RCRA. Because section 112 of the CAA and 3004(n) of RCRA are comparable in their recognition of health risk as the predominant decision factor, the EPA believes that the leak definition has been adequately analyzed under the CAA and that further evaluation is not needed prior to transferring it as part of the LDAR program under RCRA. It must also be pointed out that transfer of the CAA equipment leak standards is only the first phase of EPA's regulatory actions related to control of TSDF air emissions. In thisphase, EPA transferred a known technology to reduce emissions. If new data show that a lower leak definition is appropriate, EPA will then consider whether it is appropriate to change the rules.

C. Control Technology

Feasibility of Condensers

Comment: Several commenters did not agree that condensers provide a feasible means of meeting the 95-percent emission reduction requirement for affected process vents in the proposed standard. Problems cited by the commenters limiting the application of condensers included the presence of water in the waste stream in the TSDF portion of the facility and the wide variety of waste solvents treated by WSTF. One commenter claimed that a higher emission reduction efficiency could be achieved through an increased condenser area or a different condenser refrigerant with a lower boiling point than was used in the analysis for the proposal.

Response: In response to this comment, the feasibility of using condensers to achieve a 95-percent reduction of emissions from WSTF process vent streams was reexamined using a state-of-the-art chemical engineering computerized process simulator that includes a refrigeration unit capable of producing a coolant at a temperature as low as −29 °C (−20 °F) and a primary water-cooled heat exchanger to remove water vapor from the vent stream.

A variety of chemical constituents and operating conditions were examined to determine the organic removal efficiency achievable through condensation. The constituents selected for the condenser analysis (toluene, methyl ethyl ketone (MEK), 1,1,1 trichloroethane (TCE), and methylene chloride) were judged to be representative of the solvents recycled by the WSTF industry, based on a review of a National Association of Solvent Recyclers (NASR) survey, numerous site-specific plant trip reports, and responses to EPA section 3007 information requests. Three of these four solvents had been used in the proposal analysis; methylene chloride, at the lower end of the solvent boiling point range (i.e., more difficult to condense), was added to provide a broader range of volatilities for the condenser analysis. A total of 40 WSTF model unit cases consisting of combinations of organic emission rates, concentrations, and exhaust gas flows representing the wide range of operating conditions found at WSTF were included in the condenser analysis.

The results of the condenser analysis indicate that condensers cannot universally achieve a 95-percent emission reduction when applied to WSTF process vents. With regard to increasing organic removal efficiency by increasing condenser area or changing the condenser refrigerant, the analysis shows that there are technical limits on condenser efficiency that go beyond the condenser design and operating parameters. Specifically, the physical properties of the solvents being condensed and the solvent concentration in the gas stream affect condenser efficiency. In some situations, the partial pressure of the organic constituent in the vapor phase was too low to support a liquid phase thermodynamically regardless of the refrigerant used or condensation area; as a result, no appreciable condensation could occur. Therefore, the analysis shows that condensers are not universally applicable to the control of WSTF process vents. However, the facility process vent emission reduction requirements are not based solely on the use of condensers; carbon adsorption and incinerators/flares are capable of attaining a 95-percent control efficiency for all WSTF organics, including cases where condensation is not feasible. In summary, although condensers may not by themselves achieve a 95-percent emission reduction at all process vents, condensers do provide a practical and economic means of reducing process vent emissions, and these devices will likely be the initial choice of control technology for cases where condensation is feasible.

Feasibility of Carbon Adsorbers

Comment: Several commenters objected to the identification of carbon adsorption as a control technique because of technical and safety concerns related to the application of carbon adsorbers to low organic concentration and multicomponent solvent streams. However, one commenter did cite authorities that support a 98-percent removal for this type of control device.

Response: First it should be noted that carbon adsorption is one of several control technologies that could be used to attain the standards. Other technologies include condensers, flares, incinerators, and any other device that the owner or operator can show will meet the standards.

Regarding carbon adsorption applications, EPA acknowledges that safety is an important consideration, but concludes that any safety problems can be avoided through proper design and sorbent selection. Multicomponent systems potentially can lead to excessive heat buildup (hot spots), particularly in large carbon beds with low flow rates, which in turn can lead to fire and explosion hazards. Multicomponent vapor streams can also lead to reduced removal efficiencies for particular components. However, these technical and efficiency problems can be overcome through proper design, operation, and maintenance.

In general, coal-based carbons have fewer heat generation problems than do wood-based carbons, and small diameter beds promote good heat transfer. The bed must be designed with consideration for the least heat adsorbent (or fastest) component in the mix, as well as the component concentrations and overall flow rate. Other considerations include component interaction, gas stream relative humidity, and close monitoring of the bed effluent for breakthrough.

In response to these comments, the EPA examined carbon adsorption design, operation, and performance data from a number of plants in a wide variety of industries; in addition, the EPA has reexamined, with the help of carbon manufacturers and custom carbon adsorption equipment designers, the elements that affect carbon adsorption efficiency. This analysis has reinforced EPA's original conclusion that a well-designed, -operated, and -maintained adsorption system can achieve a 95-percent control efficiency for all organics under a wide variety of stream conditions over both short-term and long-term averaging periods. The major factors affecting performance of an adsorption unit are temperature, humidity, organics concentration, volumetric flow rate "channelling" (nonuniform flow through the carbon bed), regeneration practices, and changes in the relative concentrations of the organics admitted to the adsorption system. The WSTF/TSDF process vent stream characteristics are typically well within design limits in terms of gas temperature, pressure, and velocity for carbon adsorbers. For example, the bed adsorption rate decreases sharply when gas temperatures are above 38 °C (100 °F); a review of plant field data showed no high-temperature streams in WSTF/TSDF process vents. If high-temperature gas streams are encountered, the gas stream can be cooled prior to entering the carbon bed. Also, gas velocity entering the carbon bed should be low to allow time for adsorption to take place. The WSTF/TSDF stream flows are typically quite low and, as a result, bed depth should not be excessive.

Therefore, EPA concluded that, for WSTF/TSDF process vent streams, carbon adsorption can reasonably be expected to achieve a 95-percent control efficiency provided the adsorber is supplied with an adequate quantity of high-quality activated carbon, the gas stream receives appropriate conditioning (e.g., cooling or filtering) before entering the carbon bed, and the carbon beds are regenerated or replaced before breakthrough. The data gathered in the EPA carbon adsorption performance study do not support a higher control efficiency (i.e., 98 percent as opposed to 95 percent) for carbon adsorption units applied to WSTF/TSDF process vents on an industrywide basis, particularly in light of the design considerations related to controlling multicomponent vent streams when the organic mix is subject to frequent change.

When carbon adsorption is used to remove organics from a gas stream, the carbon must periodically be replaced or regenerated when the capacity of the carbon to adsorb organics is reached. When either regeneration or removal of carbon takes place, there is an opportunity for organics to be released to the atmosphere unless the carbon removal or regeneration is carried out under controlled conditions. There would be no environmental benefit in removing organics from an exhaust gas stream using adsorption onto activated carbon if the organics are subsequently released to the atmosphere during desorption or during carbon disposal. The EPA therefore expects that owners or operators of TSDF using carbon adsorption systems to control organic emissions take steps to ensure that proper emission control of regenerated or disposed carbon occurs. For on-site regenerable carbon adsorption systems, the owner or operator must account for the emission control of the desorption and/or disposal process in the control efficiency determination. In the case of off-site regeneration or disposal, the owner or operator should supply a certification, to be placed in the operating file of the TSDF, that all carbon removed from a carbon adsorption system used to comply with subparts AA and BB is either (1) regenerated or reactivated by a process that prevents the release of organics to the atmosphere. (**Note:** The EPA interprets "prevents" as used in this paragraph to include the application of effective control devices such as those required by these rules) or (2) incinerated in a device that meets the performance standards of subpart O.

Feasibility of Using Controls in Series

Comment: One commenter stated that EPA should evaluate carbon adsorption in series with a condenser because condensers work best with concentrated streams and carbon adsorbers with low concentration streams. The two systems together could yield an overall efficiency of 99 percent, even if each unit were only 90-percent effective.

Response: As discussed in section VII.E, the MIR from process vents after control (i.e., 4×10^{-5}) is within the range of what has been considered acceptable under RCRA. Consequently, no further control for process vents was considered necessary at this time. Nonetheless, in response to these comments, EPA evaluated the feasibility of using a carbon adsorber in series with a condenser to control WSTF/TSDF process vent emissions. The objective of the analysis was to determine if the combination of control devices would yield an overall control efficiency greater than the 95 percent that is achievable using a single device. For example, if a 99-percent overall control efficiency is desired and it is assumed that the carbon adsorber is capable of achieving a 95-percent control efficiency in all cases (a reasonable assumption for a properly designed, operated, and maintained system), then a minimum efficiency of 80 percent would be required for the condenser followed in series by the 95-percent efficient carbon bed. However, in the EPA condenser analysis conducted for the WSTF model unit cases, an 80-percent control was not achieved for 16 of the 40 cases examined. (See section 7.7 of the BID.) In 7 of the 40 cases, the analysis showed that no appreciable condensation would occur because of low solvent concentration and/or the high volatility of some solvents. Because the model unit cases are considered representative of current WSTF operations, EPA does not believe that the use of carbon adsorption and condensation in series to achieve a 99-percent control is a technically feasible control option on an industrywide basis. Such control strategies will be considered further for Phase III standards for individual facilities, if necessary, should additional analyses reveal unexpectedly high risks in specific situations.

Feasibility of Flares

Comment: Several commenters objected to the use of flares at recycling facilities because of technical and safety concerns. A few commenters cite the requirement of a constant emission source for efficient flare operation, and other commenters contend that flares are not suitable on intermittent sources or the low-level emissions typical of recycling operations. With regard to safety, flares present the danger of explosion, especially if they malfunction; according to one commenter, many State laws prohibit the use of flares at recycling facilities.

Response: Available information on WSTF operations indicates that condensers, carbon adsorbers, and incinerators are the most widely used control technologies; therefore, they are expected to be the technologies of choice to reduce organic emissions at WSTF. The final technical analyses show that a 95-percent control efficiency can be achieved with secondary condensers for many WSTF process vents or with carbon adsorbers in cases where secondary condensers are not feasible. Flares are not required controls, but are an available option for facilities so equipped provided they meet the criteria established in the final rules. Where State laws prohibit the use of flares at recycling facilities, other technologies are available.

With regard to the safety of flares, EPA has determined that the use of flares to combust organic emissions from TSDF process vents would not create safety problems if engineering precautions such as those used in the SOCMI are taken in the design and operation of the system. The following are typical engineering precautions. First, the flare should not be located in such proximity to a process unit being vented that ignition of vapors is a threat to safety. In the analysis conducted for this standard at proposal, it was assumed that the flare would be located as far as 122 meters from the process unit. Second, controls such as a fluid seal or flame arrestor are available that would prevent flashback. These safety precautions were considered in EPA's analysis for the proposed rule. Finally, the use of a purge gas, such as nitrogen, plant fuel gas, or natural gas and/or the careful control of total volumetric flow to the flare would prevent flashback in the flare stack caused by low off-gas flow.

Feasibility of LDAR Program

Comment: One commenter opposed the fugitive standards as proposed because they failed to require the proper technology to control releases from pumps and valves. The commenter claimed that the standards should require a 100-percent control, based on what available technology (e.g., sealed bellows valves, sealless pumps, or dual mechanical seals for pumps) can achieve. According to the commenter, superior emission controls cannot be rejected under RCRA solely on the basis of cost effectiveness.

Response: Control technologies for fugitive emissions from equipment leaks, as required by the proposed standards, include the use of control equipment, inspection of process equipment, and repair programs to limit or reduce emissions from leaking equipment that handle streams with total organic concentrations of greater than 10 percent. These control technologies have been studied and evaluated extensively by EPA for equipment containing fluids with 10 percent or more organics and are similar to those required by national emission standards for chemical, petrochemical, and refining facilities under the CAA.

A monthly LDAR program was proposed for WSTF/TSDF pumps and valves. Based on results of the EPA's LDAR model, once a monthly monitoring plan is in place, emission reductions of 73 percent and 59 percent can be expected for valves in gas and light liquid service, respectively, and a 61-percent reduction in emissions can be achieved for pumps in light-liquid service. For compressors, the use of mechanical seals with barrier fluid systems and control of degassing vents (95 percent) are required, although compressors are not expected to be commonly used at WSTF/TSDF. The use of control equipment (rupture disc systems or closed-vent systems to flares or incinerators) is the technical basis for control of pressure relief devices. Closed purge sampling is the required control for sampling connection systems and is the most stringent feasible control. For open-ended valves or lines the use of caps, plugs, or any other equipment that will close the open end is required; these are the most stringent controls possible. Flanges and pressure relief devices in liquid service are excluded from the routine LDAR requirements but must be monitored if leaks are indicated. For operations such as those expected at WSTF/TSDF, total reductions in fugitive emissions from equipment leaks of almost 75 percent are estimated for the entire program.

The EPA agrees with the commenter that the level of control required by the LDAR program does not result in the highest level of control that could be achieved for fugitive emissions from pumps and valves in certain applications. In some cases, there are more stringent, technologically feasible controls. For example, leakless equipment for valves, such as diaphragm and sealed bellows valves, when usable, eliminates the seals that allow fugitive emissions; thus, control efficiencies in such cases are virtually 100 percent as long as the valve does not fail. In appropriate circumstances, pumps can be controlled by dual mechanical seals that would capture nearly all fugitive emissions. An overall control efficiency of 95 percent could be achieved with dual mechanical seals based on venting of the degassing reservoir to a control device.

With regard to leakless valves, the applicability of these types of valves is limited for TSDF, as noted by EPA in the proposal preamble. The design problems associated with diaphragm valves are the temperature and pressure limitations of the elastomer used for the diaphragm. It has been found that both temperature extremes and process liquids tend to damage or destroy the diaphragm in the valve. Also, operating pressure constraints will limit the application of diaphragm valves to low-pressure operations such as pumping and product storage facilities.

There are two main disadvantages to sealed bellows valves. First, they are, for the most part, only available commercially in configurations that are used for on/off valves rather than for flow control. As a result, they cannot be used in all situations. Second, the main concern associated with this type of valve is the uncertainty of the life of the bellows seal. The metal bellows are subject to corrosion and fatigue under severe operating conditions.

Over 150 types of industries are included in the TSDF community, and EPA does not believe that leakless valves can be used in an environmentally sound manner on the wide variety of operating conditions and chemical constituents found nationwide in TSDF waste streams, many of which are highly corrosive. Corrosivity is influenced by temperature and such factors as the concentration of corrosive constituents and the presence of inhibiting or accelerating agents. Corrosion rates can be difficult to predict accurately; underestimating corrosion can lead to premature and catastrophic failures. Even small amounts (trace quantities) of corrosives in the stream can cause corrosion problems for sealed bellows valves; these tend to aggressively attack the metal bellows at crevices and cracks (including welds) to promote rapid corrosion. Sealed bellows valves particularly are subject to corrosion because the bellows is an extremely thin metallic membrane.

At proposal, it was estimated that 20 percent of all plants process halogenated compounds, which tend to be highly corrosive. The subsequently obtained 1986 Screener Survey data show that, of the TSDF indicating solvent recovery operations, at least 33 percent of the total handle halogenated organics. Furthermore, of the 12 major chemicals determined from site-specific data to be commonly occurring in waste solvent streams, all of the chemicals determined to be carcinogenic are halogenated (i.e., methylene chloride, chloroform, and carbon tetrachloride). Similarly, of the 52 constituents in TSDF waste streams contributing to the emission-weighted unit risk factor, about 50 percent are halogenated and account for the vast majority of the estimated nationwide emissions of carcinogens. Thus, TSDF are known to routinely handle and treat chemicals that may destroy sealed bellows and diaphragm valves.

The durability of metal bellows is highly questionable if the valve is operated frequently; diaphragm and bellows valves are not recommended in the technical literature for general service. The EPA does not believe that the application of sealed bellows and diaphragm valves is technologically feasible for all TSDF valve conditions or that their application would lead to a significant reduction in emissions and health risks. Valve sizes, configurations, operating temperatures and pressures, and service requirements are some of the areas in which diaphragm, pinch, and sealed bellows valves have limitations that restrict service. With regard to the emission reductions achieved by sealed bellows, diaphragm, and pinch valve technologies, these valves are not totally leakless. The technologies do eliminate the conventional seals that allow leaks from around the valve stem; however, these valves do fail in service from a variety of causes and, when failure occurs, these valves can have significant leakage. This is because these valves generally are not backed up with conventional stem seals or packing. The EPA currently is reevaluating the control efficiencies assigned to these technologies. Because these leakless types of equipment are limited in their applicability and in their potential for reducing health risks, EPA did not consider their use as an applicable control alternative at this time for nationwide TSDF standards. The EPA has requested, in a separate **Federal Register** notice (54 FR 30220, July 19, 1989), additional information on the applicability and use of leakless valves at TSDF.

For pumps, the most effective controls that are technologically feasible (e.g., dual seals) in some cases also were not selected as the basis for equipment leak standards. The impact analysis indicates that including LDAR results in less emission and risk reduction than does including equipment requirements for pumps. However, the difference in the emission and health risk reductions attributable to implementing a monthly LDAR program rather than the more stringent equipment standards for pumps appears to be small in comparison to the results of the overall standards (about 5 percent). The overall standards, including a LDAR program for pumps and valves, would achieve an expected emission reduction for TSDF equipment leaks of about 19,000 Mg/yr (21,000 ton/yr). The estimated MIR from equipment leak emissions would be reduced to 1×10^{-3} from 5×10^{-3} based on the TSDF equipment leak emission-weighted unit risk factor; cancer incidence would be reduced to 0.32 case/yr from 1.1 cases/yr. In comparison, including dual seals for pumps could achieve an additional fugitive emission reduction of about 1,200 Mg/yr (1,320 ton/yr) and an additional incidence reduction of about 0.06 case/yr. The MIR, with leakless controls for pumps, at 1×10^{-3} would be unchanged from that achieved by the LDAR program.

Given the small magnitude and the imprecise nature of the estimated emission and risk reductions associated with including dual seals for pumps in the overall standard, EPA considers the two control alternatives (i.e., LDAR and dual seals) as providing essentially the same level of protection. The data and models on which the risk estimates are based are not precise enough to quantify risk meaningfully to a more exact level. The data and models include uncertainties from the emission estimates, the air dispersion modeling, and the risk assessment that involves unit risk factor, facility location, population, and meteorologic uncertainties (see section VII.E).

The EPA considered these factors when deciding whether to require TSDF to install dual seals on pumps to control air emissions rather than to rely on monthly LDAR. Considering the limited applicability of additional equipment controls and the low potential for additional reductions in health risks of applying equipment controls for valves at TSDF and the estimated emissions and risk reductions if leakless equipment for pumps were required, EPA is not requiring leakless equipment at this time.

In Phase III, EPA will further examine the feasibility and impacts of applying additional control technology beyond the level required by today's standards. For example, dual mechanical seals may be an appropriate emission control method when applied selectively to wastes with high concentrations of toxic chemicals. In such applications, the reduction in toxic emissions (and consequently the reduction in residual risk) may be significant for select situations. A summary of the health impacts is presented in section VII.E of this preamble.

D. Impact Analyses Methodologies

Environmental Impacts Analysis

Comment: Numerous commenters criticized the environmental impact estimates for the proposed standards because (1) no actual data from operating facilities were used; (2) emission estimates were not supported by any technical data base; and (3) the waste constituents used in the analyses were not representative of waste solvent recycling operations and TSDF operations in general. Commenters also stated that the model plant solvent reclamation rates (throughputs), vent flow rates, and emission rates used at proposal were not representative of the industry.

Response: In response to these comments, EPA reviewed all available site-specific data on WSTF and TSDF, data submitted by commenters, and information generated through RCRA section 3007 questionnaires mailed to a limited number of small and large facilities. Based on all this information, EPA has revised both the TSDF model units and emission factors that serve as the bases for the impacts analyses.

With regard to the model unit revisions, the industry profile developed by EPA includes a frequency distribution of the waste volumes processed during 1985. Of the 450 facilities in the Screener Survey reporting solvent recovery by operations such as batch distillation, fractionation, or steam stripping that involved some form of hazardous waste, 365 reported the total quantity of waste recycled in 1985. The median facility throughput was slightly more than 189,000 L/yr (50,000 gal/yr); the mean throughput was about 4.5×10^6 L/yr (1.2×10^6 gal/yr). Based on the industry profile, three sizes of model units (small, medium, and large) were defined to facilitate the post-proposal analyses for control costs, emission reductions, health risks, and economic impacts.

The organic emission rates also were revised for the model units based on emission source testing conducted for EPA. The test data show that organic emission rates for primary condensers varied from a few hundredths of a kilogram (pound) to nearly 4.5 kg/h (10 lb/h), with six of the nine measurements less than 0.45 kg/h (1 lb/h). The two secondary condensers tested showed emission rates of 0.9 and 2.3 kg/h (2 and 5 lb/h), respectively.

The flow rate of 26 standard cubic feet per minute (scfm) used at proposal was found not to be generally valid for application to waste solvent recyclers. The flow rates specified for the revised model units, 3.9, 0.6, and 0.3 L/s, equivalent to 8.3, 1.2, and 0.6 scfm for the large, medium, and small model units, respectively, are based on a review of site-specific data from field tests documented in site visit reports. The large and medium TSDF process vent unit flow rates also agree with those documented in the SOCMI Distillation NSPS BID (see Docket No. F-86-AESP, item S0008) as characterizing distillation units with low overhead gas flows. The revised impact analyses are based on actual data from the industry and provide a reasonable characterization of the industry's operations and environmental impacts.

The constituents selected for the analysis of control technologies are considered to be representative of the industry, based on a review of relevant information and literature, including (1) a survey of member companies submitted by NASR, (2) 23 site-specific plant visit reports, (3) responses to the EPA section 3007 Questionnaires from 6 small and 11 large facilities (two respondents provided information for 4 facilities each), (4) the Industrial Studies Data Base (ISDB) and (5) a data base created by the Illinois EPA. The NASR survey provided information on the types of solvents most frequently recycled at member facilities; the site-specific information and EPA survey responses included waste composition data. The ISDB is a compilation of data from ongoing, in-depth surveys by EPA's Office of Solid Waste (OSW) on designated industries that are major waste generators. The Illinois EPA data base contains information from about 35,000 permit applications. Generators must submit one application for each hazardous and special nonhazardous waste stream managed in the State of Illinois. Each of these data bases contains waste stream characterization data for numerous generic spent solvent waste streams (EPA Hazardous Wastes F001-F005) and D001 wastes (ignitable), which information from the Screener Survey indicates also are recycled.

The three constituents used for the model facilities in the proposal analysis were toluene (with a boiling point (bp) of 110 °C), MEK (bp of 79 °C), and TCE (bp of 74 °C). Methylene chloride (bp of 40 °C) was added to the list of constituents evaluated in the final analysis to provide an even greater range of solvent volatilities for the analysis. Therefore, the technical feasibility and costs of applying the recommended control techniques were evaluated for constituents representing the range of characteristics and volatilities of commonly recycled solvents at TSDF.

Comment: Commenters also stated that it is inappropriate to apply the fugitive emission factors to TSDF that were developed to estimate leaks from a typical hydrocarbon plant because they do not relate to the design, operating conditions, maintenance practices, or controls associated with processing of waste solvents and other toxic wastes. According to the commenters, the emission factors and model units also need adjustment to account for volatility because not accounting for differences in vapor pressure overestimates risk as well as emissions and underestimates costs for controls.

Response: The EPA disagrees; the data used in establishing the fugitive emission standards for TSDF are based on emission and process data collected at a variety of petroleum refinery and SOCMI operating units. The EPA Industrial Environmental Research Laboratory (IERL) coordinated a study to develop information on fugitive emissions in the SOCMI. A total of 24 chemical process units were tested; these data covered thousands of screened sources (pumps, valves, flanges, etc.) and included units handling such chemicals as acetone, phenol, MEK, ethylene dichloride, TCE, trichloroethylene, and perchloroethylene.

Refinery studies on fugitives also include tests on units handling both toluene and xylene. These same chemicals are included in those listed by the NASR as solvents commonly recycled by member facilities and are found in other sources of waste solvent constituent information that are described in the BID. The chemicals commonly recycled at TSDF are those produced in SOCMI operating units and handled in petroleum refineries, and the equipment involved in these industries is typically the same (pumps, valves, etc.). Therefore, it is reasonable to conclude that the emissions associated with these chemicals and equipment are similar and to expect similar emission control performance and efficiencies at hazardous waste management units.

The EPA agrees that the equipment leak standards should take component volatility into consideration. Previous EPA and industry studies have shown that the volatility of stream components, as a process variable, does correlate with fugitive emission and leak rates. An analysis of the vapor pressures and emission rates has shown that substances with vapor pressures of 0.3 kPa or higher had significantly higher emission and leak rates than did those with lower vapor pressures (EPA-450/3-82-010). This result led to the separation of equipment component emissions by service: gas/vapor, light liquid, and heavy liquid. These classifications have been used in most CAA fugitive emission standards to effectively direct the major effort toward equipment most likely to leak. Therefore the rules have been revised to account for volatility. For example, pumps and valves in heavy-liquid service must be monitored only if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method. The determination of light- and heavy-liquid service is based on the vapor pressure of the components in the stream (less than 0.3 kPa at 20 °C defines a heavy liquid).

All of the constituents used in the model unit analysis, representing the ranges of characteristics of commonly recycled solvents, are light liquids to which the benzene and SOCMI fugitive emission factors are applicable. Therefore, the revised risk and cost analyses for WSTF equipment leak fugitive emissions are based on the fugitive emission factors used in the proposal analysis. The analyses of risk and cost impacts on TSDF with affected fugitive emission sources also were revised after proposal to account for the differences in light and heavy liquids.

Health Risk Impacts Analysis

Comment: Several commenters objected to the limited support provided for selection and derivation of the unit risk factors used in the analysis of cancer risks and contend that the risk analysis and unit risk factors are not representative of the wide variety of wastes handled. A few of the commenters stated that the upper-bound risk factor was too high, and others stated it was too low.

Response: The selection of the range of unit risk factors (i.e., 2×10^{-7} and 2×10^{-5} $(\mu g/m^3)^{-1}$ used at proposal to estimate the cancer risk resulting from TSDF emissions was based on an analysis of the organic chemicals associated with TSDF operations. This analysis found that carbon tetrachloride is the organic chemical with the most individual impact vis-a-vis emissions and risk. Thus, it was used as the upper bound on the range of unit risk factors used to calculate health impacts (i.e., cancer risk) at proposal. However, this range of unit risk factors was not used in the final analysis.

Based on public comments, EPA revised its health risk impacts analysis. To estimate the cancer potency of TSDF air emissions in the revised analysis, an emission-weighted composite unit cancer risk estimate approach was used by EPA to address the problem of dealing with the large number of toxic chemicals that are present at many TSDF. Use of the emission-weighted composite factor rather than individual component unit cancer risk factors simplifies the risk assessment so that calculations do not need to be performed for each chemical emitted. The composite unit cancer risk factor is combined with estimates of ambient concentrations of total organics and population exposure to estimate risk due to nationwide TSDF emissions. In calculating the emission-weighted average unit risk factor, the emission estimate for a compound is first multiplied by the unit cancer risk factor for that compound; then the emission-weighted average is computed by summing these products and dividing the sum by the total nationwide TSDF emission value, which includes both carcinogenic and noncarcinogenic organic emissions. Using this type of average would give the same results as calculating the risk for each chemical involved. However, only those carcinogens for which unit risk factors are available were included in the analysis of cancer risk under this approach.

Through use of the EPA's TSDF Waste Characterization Data Base (WCDB) (discussed in appendix D of the BID) and a computerized model developed for analysis of the regulatory options for TSDF emission sources, EPA estimated total nationwide TSDF organic emissions by specific waste constituent. Thirty-nine chemicals were identified as TSDF organic air pollutant emission constituents emitted from equipment leaks at all types of TSDF waste management processes. Unit cancer risk factors for these constituents were then averaged based on both individual constituent and total nationwide TSDF equipment leak organic emissions to calculate an emission-weighted composite mean TSDF cancer unit risk factor.

Numerous constituents with higher unit risk factors than carbon tetrachloride (including acrylonitrile and ethylene oxide) were included in the calculation of the emission-weighted unit cancer risk factor for TSDF equipment leaks. This emission-weighted unit risk factor value was determined to be 4.5×10^{-6} $(\mu g/m^3)^{-1}$ and was used to determine the health-related impacts associated with TSDF equipment leak (fugitive) emissions rather than the range of the unit cancer risk factors used at proposal that represented a limited number of chemical compounds emitted at WSTF. A more detailed discussion of the hazardous waste TSDF unit risk factor determination is contained in appendix B of the BID.

Characterization of WSTF waste streams in the final analysis indicates that the constituents used at proposal in the risk analysis are appropriate and representative of the waste solvent recycling industry. However, insufficient nationwide data on WSTF (a subset of the TSDF industry) waste stream chemical constituent quantities and concentrations were available to develop an emission-weighted, arithmetic mean cancer unit risk factor for WSTF process vents. While information on a small number of process vent streams was available for the revised analysis, the data were too limited to support the conclusion that the mix and percentage of constituents found were representative of the entire industry.

The WSTF waste streams and their associated process vent emissions were found to contain a variety of chemical constituents. Those constituents with established risk factors were, in all cases for the plant-specific data, the halogenated organics; these halogenated organic constituent concentrations tended to be quite low, generally less than 1 percent of organics emitted. Therefore, EPA judged, based on the limited data available, that use of a midrange unit risk factor would be appropriate in estimating nationwide health impacts associated with WSTF process vents. The unit cancer risk factor assumed at proposal, 2×10^{-6} $(\mu g/m^3)^{-1}$, was the geometric midrange between the highest and lowest unit risk factor for the constituents found in the WSTF process vent streams. The composite unit cancer risk factor calculated for the equipment leak emissions agrees favorably with the process vent number used at proposal. Because it is not unreasonable to assume a similar mix of constituents in process vents as in equipment leaks, and because available data do not suggest otherwise, for the purpose of estimating impacts, the same unit cancer risk factor was used for both process vents and equipment leaks, 4.5×10^{-6} $(\mu g/m^3)^{-1}$.

Comment: Several commenters also stated that the failure to address the weight of evidence for carcinogenicity is inconsistent with EPA's risk assessment guidelines and the principles for assessing cancer risk.

Response: Early in the rulemaking for TSDF, EPA looked at the contribution to total estimated risk (annual incidence) by weight of evidence. At that time, "C" carcinogens accounted for about 5 percent of the total risk, and "A" carcinogens about 10 percent. Thus, for all practical purposes, calculating separate risk estimates for chemicals in each weight of evidence category adds little to the risk assessment. Moreover, EPA's Guidelines for Carcinogen Risk Assessment (51 FR 33992) and Guidelines for the Health Risk Assessment of Chemical Mixtures (51 FR 34014) do not describe a means to quantitatively incorporate weight of evidence into risk assessments. Thus, there is no inconsistency between the risk assessment guidelines and the presentation of health risk in this rulemaking.

Comment: Other commenters believed that the risk assessment for the proposed standards was flawed because EPA did not consider noncancer health effects and because large uncertainties are introduced when the additive or synergistic effects of carcinogens and the interindividual variability in response are not factored in.

Response: The EPA does recognize that health effects other than cancer may be associated with both short-term and long-term human exposure to the organic chemicals emitted to the air at WSTF/TSDF. The EPA believes, however, that a risk assessment based on cancer serves as the clearest basis for evaluating the health effects associated with exposure to air emissions from TSDF. A quantitative assessment of the potential nationwide noncancer health impacts (e.g., developmental, neurological, immunological, and respiratory effects) was not conducted due to deficiencies at this time in the health data base for these types of effects.

Although unable to numerically quantify noncancer health risks, EPA did conduct a screening analysis of the potential adverse noncancer health effects associated with short-term and long-term exposure to individual waste constituents emitted from TSDF. This analysis was based on a comparison of relevant health data to the highest short-term or long-term modeled ambient concentrations for chemicals at each of two selected TSDF. (A detailed presentation of the screening analysis is contained in the BID, appendix B.)

Results of this analysis suggest that adverse noncancer health effects are unlikely to be associated with acute or chronic inhalation exposure to TSDF organic emissions. It should be noted that the health data base for many chemicals was limited particularly for short-term exposures. The conclusions reached in this preliminary analysis should be considered in the context of the limitations of the health data; the uncertainties associated with the characterization of wastes at the facilities; and the assumptions used in estimating emissions, ambient concentrations, and the potential for human exposure. Additional evaluation of noncancer health effects may be undertaken as part of the third phase of the TSDF regulatory program. To that effect, in the proposal preamble for the Phase II TSDF air rules, EPA is specifically requesting comments from the public on methodologies and use of health data for assessing the noncancer health effects of TSDF organic emissions. In addition, because there is a potential for cancer and noncancer health effects from TSDF chemicals from indirect pathways such as ingestion of foods contaminated by air toxics that have deposited in the soil, EPA will evaluate the need to include an indirect pathway element in the TSDF health risk analysis in the future.

The EPA is aware of the uncertainties inherent in predicting the magnitude and nature of toxicant interactions between individual chemicals in chemical mixtures. In the absence of toxicity data on the specific mixtures of concern, and with insufficient quantitative information on the potential interaction among the components (i.e., additivity, synergism, or antagonism), the EPA has assumed additivity to estimate the carcinogenicity of the mixtures of concern. This is consistent with guidance provided in the 1986 "EPA Guidelines for the Health Risk Assessment of Chemical Mixtures" (51 FR 34014).

The EPA also recognizes that there are uncertainties associated with the variability of individual human responses following exposures to toxicants. As stated in the 1986 "EPA Guidelines for Carcinogen Risk Assessment" (51 FR 33992) human populations are variable with respect to genetic constitution, diet, occupational and home environment, activity patterns, and other cultural factors. Because of insufficient data, however, the EPA is unable to determine the potential impact of these factors on the estimates of risk associated with exposure to carcinogens emitted from TSDF.

Cost Impacts Analysis

Comment: Various commenters questioned the cost estimates used in the analysis for carbon adsorbers and condensers as well as the nationwide recovery credits for WSTF and TSDF. Commenters contend that the costs for carbon adsorbers estimated at proposal are low because a device is needed for each vent if manifolding is not practiced as a result of (1) the potential for cross-contamination of new or recycled materials and (2) additional incurred costs when the carbon is regenerated or disposed of.

Response: In response to these comments EPA evaluated controls for 40 model unit cases representing ranges and combinations of solvent physical properties, total flow rates, and organic concentrations in the vent stream. Both carbon canisters and fixed-bed regenerable carbon systems were costed for process vent streams where condensers would not achieve a 95-percent reduction because of stream conditions. The analysis showed that, for a stream with an emission rate greater than 0.45 kg/h (1 lb/h), a carbon bed can achieve the same emission reduction at lower cost than can a carbon canister. Thus, there is a level of emissions at which the facility owner or operator for economic reasons will switch from the use of replaceable carbon canisters to the use of a fixed-bed regenerable carbon adsorption system. The capital costs (1986 $) of the fixed-bed regenerable carbon systems ranged from $97,300 up to $202,000, and annual operating costs ranged from $40,200 to $43,500 (from $33,100 to $43,100 when a recovery credit is included). The capital cost (1986 $) of a carbon canister was $1,050, and annual operating costs ranged from $7,890 to $24,800 (carbon canisters are not regenerated on site and a recovery credit is not included). The fixed-bed, regenerable carbon system operating costs include regeneration/disposal of spent carbon; carbon canister operating costs include carbon replacement and disposal. Thus, these costs were used in conducting the final impact analyses.

With regard to the requirement of a control device for each vent, EPA acknowledges that there are instances where vent manifolding is not allowed because of potential product contamination. However the product has already been recovered from the process prior to exhaust gases passing to the vents, which are sources of organic emissions to the atmosphere; therefore, manifolding of the vent streams should not lead to a product contamination problem.

In the absence of the site-specific information needed to determine control device requirements, for the purposes of estimating cost impacts, it was assumed in the revised analysis that one control device would be needed per WSTF. Although this assumption may underestimate the control cost for a facility that chooses to install carbon adsorbers on more than one vent, it is potentially a very small underestimate because the total annual cost of a carbon canister, for example, is comprised almost totally of annual operating costs, which are directly proportional to the emissions removed. Thus the potential underestimate in total annual cost resulting from assuming one carbon adsorber per facility is not significant. Furthermore, the addition of the process vent emission limit to the rules based on the total facility emission rate lessens the likelihood that a facility will need to control multiple process vents to attain the allowable emission rate of 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 ton/yr).

Several commenters also questioned the nationwide cost credit for secondary condensers estimated at proposal, stating that secondary condensers actually would result in substantial costs and that the cost estimates do not account for the more sophisticated systems needed in high-humidity areas to allow for equipment deicing or water removal. In response to concerns regarding the estimated condenser yields and the requirement for more sophisticated systems in high-humidity areas, EPA utilized a state-of-the-art computerized process simulator known as the Advanced System for Process Engineering (ASPEN) for reevaluating analyses of condenser design and cost. The ASPEN condenser configuration included an optional primary water-cooled heat exchanger to reduce the size of the refrigeration unit and to remove water vapor in order to avoid freezing problems because the condenser temperature is low enough to cause ice buildup on heat transfer surfaces. Therefore, the revised cost estimates account for water removal.

The model unit cases represent industrywide ranges and combinations of vent stream characteristics. For the large model unit cases (3.9 L/s total flow rate), total annual cost with recovery credit ranged from a credit of $4,980 up to a net of no cost. For the medium model unit cases (0.6 L/s total flow rate), the total annual cost with recovery credit ranged from $630 up to $2,000. For the small model unit cases (0.3 L/s total flow rate), the total annual cost with recovery credit ranged from $1,770 up to $2,000. Therefore, in many cases, the use of secondary condensers does result in positive costs; these costs, however do not result in adverse economic impacts.

The model unit control cost estimates and the WSTF industry profile were used to generate nationwide control cost estimates of implementing the process vent regulations. The cost estimates are for 73 large facilities and 167 medium facilities. The 208 small facilities (less than 189,000 L (50,000 gal) throughput/yr as defined in the post-proposal analysis) would not have to install additional controls because their emissions are less than the facility process vent cutoff.

Because there was insufficient site-specific information available to determine which facilities could apply condensation rather than carbon adsorption, upper- and lower-bound estimates were generated. The upperbound cost estimate is based on the assumption that fixed-bed, regenerable carbon adsorption systems would be required to control process vents at all facilities with emissions above the emission rate cutoff. Similarly the lower-bound cost estimate is based on the assumption that condensers could be used to control process vents at all facilities with emissions above the emission rate cutoff. The range in estimates of nationwide total annual cost is from a credit of $68,000 up to a cost of $12.9 million, assuming the installation of one control device per facility.

Finally, EPA agrees that a recovery credit is not applicable to TSDF in general because most of the hazardous wastes handled at TSDF are destined for disposal. In contrast, at a WSTF, the air emissions resulting from equipment leaks are potentially recyclable solvents. Thus, no recovery credit was applied for TSDF other than WSTF in the analyses for the final equipment leak standards.

E. Implementation and Compliance

Test Methods

Comment: Commenters argued that the test methods proposed for use in determining whether waste streams contain more than 10 percent total organics are inappropriate primarily because they do not measure volatile organics. One commenter objected to the use of weight percent when defining "in VHAP service" based on liquid sample analyses.

Response: The EPA recognized that each of the various test methods proposed for determining the organic content of waste streams had limitations and that none was universally applicable. The determination of subpart BB applicability should not require precise measurement of the 10 percent total organics by weight in most cases. The EPA anticipates that most waste streams will have an organic content much lower or much higher than 10 percent. Furthermore, because the regulation requires control if the organic content of the waste stream ever equals or exceeds the 10-percent value, EPA believes that few owners or operators will claim that a waste stream is not subject to the requirements of the standard based on a sample analysis with results near 10 percent. Therefore, a precise measurement of waste stream total organic content is not likely to be needed to determine applicability of the equipment leak standards.

If the facility does decide to test the waste, the choice of the appropriate method must be based on a knowledge of the process and waste. The EPA has prepared a guidance document that includes information to aid TSDF owners/operators and enforcement and permitting personnel in implementing the regulations. Additional detail is provided in the guidance document to aid in choosing the most appropriate test method. (Refer to "Hazardous Waste TSDF—Technical Guidance Document for RCRA Air Emission Standards for Process Vents and Equipment Leaks." EPA-450/3-89-21.)

In response to the commenters' concerns that volatility of the waste stream should be considered, the LDAR provisions of the regulation were changed to establish two potential levels of required monitoring. Those processes with the greater emission potential are designated to be in light-liquid service and are required to implement a more restrictive LDAR program. Those processes with a lesser emission potential are designated to be in heavy-liquid service and are required to implement a less restrictive LDAR program. The determination of being in light-liquid service is based on the concentration of organic components in a waste whose pure vapor pressure exceeds 0.3 kPa. This addresses the commenters' concerns that volatility of the waste stream should be considered. For the process vent portion of the regulation, if an organic is present at the vent, it is presumed to be volatile. Therefore, volatility is considered by virtue of where the determination of applicability is made.

With reference to the use of weight percent when defining "in VHAP service" (a term that has been dropped from the promulgated regulations), EPA believes that weight percentage is the unit of choice when the determination of organic content is made on a solid, liquid, or sludge waste. It is also commonly associated with those types of wastes. For gaseous streams that exceed 10 percent organics by weight, the commenter's point is well taken. Volume fractions are more commonly reported for gaseous streams. However, it is not easier to calculate the volume percent rather than weight percent. Additional information on the calibration standard used, the carrier gas in the standard, and both the organic and other inorganic gases in the sample are required in both cases. For simplicity, the units of the standard are uniformly weight percent regardless of waste type.

Implementation Schedule

Comment: Several commenters objected to the time periods contained in the proposed standards for implementation schedules and requested that EPA not dictate a step-by-step schedule.

Response: The EPA agrees with the commenters that EPA should not dictate step-by-step implementation schedules for installing the control devices and closed-vent systems required to comply with these regulations because each affected facility needs some flexibility to budget funds, perform engineering evaluations, and complete construction. Therefore, EPA has dropped the interim dates in the schedule and retained only the final period of 2 years from the promulgation for completing engineering design and evaluation studies and for installing equipment. The final rules require that all affected facilities comply with the standards on the effective date; however, the rules allow up to 24 months from the promulgation date (i.e., 18 months after the effective date) for facilities to comply if they are required to install a control device and they can document that installation of the emission controls cannot reasonably be expected to be completed earlier. Existing waste management units that become newly regulated units subject to the provisions of subpart AA or BB because of a new statutory or regulatory amendment under RCRA (e.g., a new listing or identification of a hazardous waste) will have up to 18 months after the effective date of the statutory or regulatory amendments that render the facility subject to the provisions of subparts AA or BB to complete installation of the control device. New hazardous waste management units starting operation after the effective date of subparts AA and BB must meet the standards upon startup. This subject is discussed further in section IX. Implementation, of this preamble. The final standards require that both permitted and interim status facilities maintain the schedules and the accompanying documentation in their operating records. The implementation schedule must be in the operating record on the effective date of today's rule, which is 6 months after promulgation. No provisions have been made in the standards for extensions beyond 24 months after promulgation.

Permitting Requirements

Comment: Several commenters suggested that RCRA part B information requirements be limited to the units already included in the part B application. Units that must comply with this regulation because the facility is subject to RCRA permit requirements for other reasons should not be required to be added to the part B permit application. Other commenters objected to statements in the preamble regarding the role of the omnibus permitting authority under RCRA section 3005(c)(3). The commenters questioned the absence of criteria for establishing when such authority would be applied to require more stringent controls and argued that authorizing permit writers to impose more stringent controls based on unenforceable guidance is not a substitute for regulations.

Response: The EPA is aware that extending specific part B information requirements to those hazardous waste management units that are not subject to RCRA permitting but are located at facilities that are otherwise subject to RCRA permit requirements could result in the need for those facilities to modify RCRA permits or their part B applications. However, EPA believes that extending the part B information requirements to hazardous waste management units not subject to RCRA permitting is necessary to ensure compliance with the subpart AA and subpart BB standards.

The EPA also agrees that requiring a modification of RCRA permits (and part B applications) as part of this rule could result in delays in processing and issuing final RCRA permits. Therefore, the final rules do not require facilities to modify permits issued before the effective date of these rules. Consistent with 40 CFR 270.4, a facility with a final permit issued prior to the effective date is generally not required to comply with new part 264 standards until its permit is reissued or reviewed by the Regional Administrator. Hazardous waste management units and associated process vents and equipment affected by these standards must be added or incorporated into the facility permit when the permit comes up for review under § 270.50 or reissue under § 124.15. As previously noted, EPA intends to propose to modify this policy in the forthcoming Phase II rules such that permitted facilities must comply with the interim-status air rules.

Facilities that have obtained RCRA interim status, as specified in 40 CFR 270.70 (i.e., compliance with the requirements of section 3010(a) of RCRA pertaining to notification of hazardous waste activity and the requirements of 40 CFR 270.10 governing submission of part A applications), will be subject to the part 265 standards on the effective date. Interim status facilities that have submitted their part B application prior to the effective date of the regulation will be required to modify their part B applications to incorporate today's requirements.

The omnibus permitting authority of § 270.32 allows permit writers to require, on a case-by-case basis, emission controls that are more stringent than those specified by a standard. The EPA has a mandate to use this authority for situations in which regulations have not been developed or in which special requirements are needed to protect human health and the environment. For example, this authority could be used in situations where, in the permit writers judgment, there is an unacceptably high risk after application of controls required by an emission standard. This aspect of the permitting process is discussed further in section IX of this preamble. The EPA is currently preparing guidance to be used by permit writers to help identify facilities that would potentially have high residual risk due to air emissions. The guidance will include procedures to be used to identify potentially high-risk facilities and will include guidance for making a formal, site-specific risk assessment.

Recordkeeping and Reporting

Comment: Commenters asked EPA to include a provision in the final standards to provide for the elimination of recordkeeping requirements that may be duplicative of State or Federal requirements for equipment leaks. Commenters also asked whether TSDF are subject to any notification requirements if their waste stream is less than 10 percent organics.

Response: The EPA agrees that duplicative recordkeeping and reporting should generally be eliminated to the extent possible. Because of the difficulties in foreseeing all situations in which this could occur, a provision to this effect has not been added to the final standards. However, when records and reports required by States are substantially similar, a copy of the information submitted to the State will generally be acceptable to EPA. When similar records and reports are required by other EPA programs (such as the visual observations required for pumps and valves associated with storage tanks and incinerators), EPA suggests that owners or operators of TSDF coordinate monitoring and recordkeeping efforts to reduce labor and costs. One set of records should be maintained with emphasis on the more detailed monitoring records required by these standards. The EPA considers that the monitoring required for equipment leaks under these standards differs significantly from the monitoring required for ground water protection purposes under other RCRA rules. However, the monitoring and recordkeeping programs can be combined for efficiency.

There are no notification requirements in the equipment leak rules for waste streams that have been determined never to exceed 10 percent total organics by weight.

VII. Summary of Impacts of Final Standards

A. Overview of the Source Category

Hazardous waste TSDF are facilities that store, treat, or dispose of hazardous wastes. A TSDF may generate and manage hazardous waste on the same site, or it may receive and manage hazardous waste generated by others.

The EPA has conducted a number of surveys to collect information about the TSDF industry. The most recent of these surveys, the 1986 National Screening Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities, lists more than 2,300 TSDF nationwide. Available survey data further indicate that the majority (96 percent) of waste managed at TSDF is generated and managed on the same site and identifies more than 150 different industries, primarily manufacturing, that generate hazardous waste. Approximately 500 TSDF are commercial facilities that manage hazardous waste generated by others.

The types of wastes managed at TSDF and the waste management processes used are highly variable from one facility to another. The physical characteristics of wastes managed at TSDF include dilute wastewaters (representing more than 90 percent by weight of the total waste managed), organic and inorganic sludges, and organic and inorganic solids. Waste management processes differ according to waste type and include storage and treatment in tanks, surface impoundments, and wastepiles; handling or storage in containers such as drums, tank trucks, tank cars, and dumpsters; and disposal of waste in landfills, surface impoundments, injection wells, and by land treatment. In addition, hazardous waste may be managed in "miscellaneous units" that do not meet the RCRA definition of any of the processes listed above. Hazardous waste may also be handled in research, development, and demonstration units as described in 40 CFR 270.65.

The promulgated standards limit organic emissions from (1) hazardous waste management unit process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, and air and stream stripping operations that manage waste with 10 ppmw or greater total organics concentration, and (2) leaks from equipment at new and existing hazardous waste management units that contain or contact hazardous waste streams with 10 percent or more total organics. The final equipment leak standards apply to each pump valve, compressor, pressure relief device, sampling connection, open-ended valve or line, flange, or other connector associated with the affected hazardous waste management unit. About 1,400 facilities are estimated to be potentially subject to the equipment leak standards (i.e., TSDF managing hazardous waste containing at least 10 percent organics). Of these, 450 are estimated to have process vents subject to the vent standards in subpart AA.

B. Use of Models in the Regulatory Development Process

In estimating baseline (i.e., unregulated) emissions, emission impacts of the regulatory options, and control costs for the options for equipment leaks, EPA made use of a combination of analytical and physical models of waste management processes. This approach was selected because insufficient facility-specific data are available to conduct a site-specific characterization of the entire TSDF industry. For example, the physicalmodels of waste management processes (or units) were used as simplified representations of the equipment component mix expected to be associated with each particular hazardous waste management process. The model unit provides an estimate of the number of pumps, valves, open-ended lines, pressure relief valves, and sampling connections that are used in the waste management process. Although these models are not exact for each type of process, they provide a reasonable approximation of what can be expected on average; precise equipment counts for each unit at each facility are not available.

In the absence of sufficient site-specific data, EPA developed a model to calculate nationwide health, environmental, and cost impacts associated with hazardous waste TSDF. Details of the national impacts model can be found in the BID, appendix D. This national impacts model was used to estimate the nationwide impacts necessary for comparison of the various TSDF equipment leak emission control options. The national impacts model is a complex computer program that uses a wide variety of information and data concerning the TSDF industry to calculate nationwide impacts through summation of approximate individual facility results. Information processed by the model includes results of TSDF industry surveys as well as characterizations and simulations of TSDF processes and wastes, emission factors of each type of management unit, the efficiencies and costs of emission control technologies, and exposure and health impacts of TSDF pollutants. This information is contained in several independent data files developed by EPA for use as inputs to the model. These data files are briefly described below.

Industry profile data identify the name, location, primary standard industrial classification (SIC) code, waste management processes, waste types, and waste volumes for each TSDF. The industry data were obtained from three principal sources: A 1986 National Screening Survey of Hazardous Waste Treatment, Storage, Disposal, and Recycling Facilities; the Hazardous Waste Data Management System's RCRA part A permit applications; and the 1981 National Survey of Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities Regulated Under RCRA. The industry data are used in the model to define the location and the SIC code for each facility and to identify the waste management units at each facility as well as the types and quantities of waste managed in each unit.

The hazardous waste characterization consists of waste data representative of typical wastes handled by facilities in each SIC code. The waste data are linked to specific facilities by the SIC code and the RCRA waste codes identified for that facility in the industry profile. The waste characterization data include chemical properties information that consists of constituent-specific data on the physical, chemical, and biological properties of a group of surrogate waste constituents that were developed to represent the more than 4,000 TSDF waste constituents identified in the waste data base. The surrogate categories were defined to represent actual organic compounds based on a combination of their vapor pressures, Henry's law constants, and biodegradability. The use of surrogate properties was instituted to compensate for a lack of constituent-specific physical and chemical property data and to reduce the number of chemicals to be assessed by the model.

The emission factors data consist of emission factors, expressed as emissions per unit of waste throughput, for each combination of surrogate waste constituent and model waste management process. Each model waste management process was, in effect, a "national average model unit" that represented a weighted average of the operating parameters of existing waste management units. The EPA's LDAR model was used to develop emission control efficiencies and emission reductions for the TSDF equipment leak emission factors used in the analysis. This LDAR model is based on the Agency's extensive experience with equipment leaks in the petrochemical and synthetic organic chemical manufacturing industries.

Incidence data consist of estimates of annual cancer incidence for the population within 50 km of each TSDF. This information was developed using EPA's Human Exposure Model, 1980 census data, and local meteorological data summaries. Because some of the data used in the national impacts model are based on national average values rather than actual facility-specific data, maximum risk numbers generated by the model are not considered to be representative of facility-specific risks. Maximum individual risk has meaning only at the facility level. Therefore, EPA chose to use another methodology for estimating MIR for equipment leaks. This is discussed further in section VII.E.

Data related to emission control technologies and costs include information that describes control efficiencies, capital investment, and annual operating costs for each emission control option that is applicable to a particular waste management process. These data were obtained through engineering analyses of control device operations and the development of engineering cost estimates.

To make use of all of these data, the national impacts model contains procedures that (1) identify TSDF facilities, their waste management processes, waste compositions, and annual waste throughputs; (2) assign chemical properties to waste constituents and assign control devices to process units; and (3) calculate uncontrolled emissions, emissions reductions, control costs, and health impacts. Results produced by the model include, on a nationwide basis, uncontrolled emissions, controlled emissions, capital investment costs, annual operating costs, annualized costs for controls, and annual cancer incidence. As previously stated, these nationwide values are obtained by summing the results of individual facility analyses across all facilities.

The primary objective and intended use of the national impacts model are to provide reasonable estimates of TSDF impacts on a nationwide basis. Because of the complexity of the hazardous waste management industry and the current lack of detailed information for individual TSDF, the model was developed to utilize national average data where site-specific data are not available. As a result, the estimated emissions and cancer incidence from the model do not represent the impacts for a specific individual facility. However, with national average data values used where site-specific data were missing, EPA believes that the estimates are reasonable on a nationwide basis and are adequate for decisionmaking.

C. Emission Impacts

Since proposal in February 1987, EPA has reviewed all available site-specific information and data on WSTF and TSDF, much of which has only become available since proposal. For example, EPA is conducting a multiyear project to collect information on the Nation's generation of hazardous waste and the capacity available to treat, store, dispose of, and recycle that waste. The initial phase of the project was the 1986 National Screening Survey of Hazardous Waste Treatment, Storage, Disposal and Recycling Facilities, which identified and collected summary information from all hazardous waste treatment, storage, disposal, and recycling facilities in the United States. The results of this "Screener Survey" together with data from other existing data bases (such as the Hazardous Waste Data Management System's RCRA part A applications; the National Survey of Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities Regulated Under RCRA in 1981; the Industry Studies Database; a data base of 40 CFR 261.32 hazardous wastes from specific sources; the WET Model Hazardous Waste Data Base; and a data base created by the Illinois EPA) were used to support the development and analysis of these air emission regulations for hazardous waste TSDF. Additional sources of data on TSDF and waste solvent recycling operations included EPA field reports on hazardous waste facilities and responses to RCRA section 3007 information requests sent to a limited number of both large and small facilities. Based on all of this information, EPA has revised and expanded the impact analyses, including estimates of emissions, risks, costs, and the economic impact on small businesses and on the industry as a whole.

Using the revised impact analyses, nationwide (unregulated) baseline equipment leak organic emissions from TSDF waste streams of 10 percent or greater total organics are estimated at 26,200 Mg/yr. This estimate includes equipment leak emissions from waste solvent treatment facilities and from other TSDF with hazardous waste management processes handling wastes with organic concentrations of 10 percent or greater, a total of about 1,400 facilities. The bases for these estimates are contained in the BID, appendix D.

Nationwide (unregulated) organic emissions from process vents at about 450 TSDF with solvent recovery operations range from 300 Mg/yr (based on lower-bound emission rates) to 8,100 Mg/yr (based on upper-bound emission rates). This wide emission range occurs because of variations in primary condenser recovery efficiencies and the use of secondary condensers at some sites. The lower-bound rate represents high recovery efficiencies at all facilities, and the upper-bound rate represents low recovery efficiencies at all facilities. Actual nationwide emissions should fall between these values.

With the implementation of the standards, nationwide TSDF equipment leak emissions will be reduced to about 7,200 Mg/yr; nationwide organic emissions from process vents will be reduced to a range from 270 Mg/yr (lower-bound emission rates) to 900 Mg/yr (upper-bound emission rates).

D. Ozone Impacts

Reductions in organic emissions from TSDF sources will have a positive impact on human health and the environment by reducing atmospheric ozone formation as a result of reductions in emissions of ozone precursors, primarily organic compounds. Ozone is a major problem in most larger cities, and EPA has estimated that more than 100 million people live in areas that are in violation of the ambient ozone standards. Ozone is a pulmonary irritant that can impair the normal functions of human lungs, may increase susceptibility to bacterial infections, and can result in other detrimental health effects. In addition, ozone can reduce the yields of citrus, cotton, potatoes, soybeans, wheat, spinach, and other crops, and can cause damage to conifer forests and a reduction in the fruit and seed diets of wildlife. Because TSDF organic emissions account for about 12 percent of total nationwide organic emissions from stationary sources, today's rules will contribute to a reduction in ozone-induced health and environmental effects and will assist in attainment and maintenance of the ambient air quality standards for ozone. Table 1 summarizes the emissions and health risk impact estimates.

Ozone precursors and chlorofluorocarbons, whose emissions will be reduced by this rulemaking, are both considered greenhouse gases (i.e., gases whose accumulation in the atmosphere has been related to global warming). Although the regulation's direct impact on global warming has not been quantified, the direction being taken is a positive one. Implementation of these rules will reduce tropospheric ozone, which contributes to global warming.

E. Health Risk Impacts

Human health risks posed by exposure to TSDF air emissions are typically quantified in two forms: Annual cancer incidence and MIR. Annual cancer incidence is the estimated number of cancer cases per year due to exposure to TSDF emissions nationwide. The MIR, on the other hand, represents the potential risk to the one hypothetical individual who lives closest to a reasonable worst-case TSDF for a lifetime of 70 years. The MIR is derived from modeling a reasonable worst-case scenario and is not based on actual measurement of risk. It is not representative of the entire industry, and, in fact, may be experienced by few, if any, individuals. As explained in appendix B of the BID, there are great uncertainties in both these types of health risk estimates. These two health risk forms were used as an index to quantify health impacts related to TSDF emissions and emission controls. As discussed in section VI.D., an equipment-leak-specific, emission-weighted unit risk factor of 4.5×10^{-6} $(\mu g/m^3)^{-1}$ was used to estimate the nationwide annual cancer incidence and the MIR of contracting cancer associated with TSDF equipment leak organic emissions. See appendix B of the BID for a detailed analysis of the health risk impacts.

At proposal, order-of-magnitude health impacts were estimated for cancer risks from exposure to organic air emissions from WSTF and TSDF. The Human Exposure Model (HEM) was used to calculate the magnitude of risks posed by WSTF at both typical and maximum emission rates. Based on an estimated urban/rural distribution, EPA selected six WSTF to represent the nationwide WSTF industry in performing the risk assessment. Using the results of the analysis of these "typical" facilities, health impacts were extrapolated to all WSTF and TSDF in general to provide nationwide estimates.

In the revised health impacts analysis for the final rules, annual cancer incidence and MIR were again used to quantify health impacts for the control alternatives for process vents and equipment leaks. However, in this followup analysis, the HEM was run using site-specific data on facility waste throughputs, emission rates, meteorology, and population density for each WSTF and TSDF nationwide identified in the various data bases.

The facility-specific information was obtained from three principal sources. Waste quantity and solvent recycling data were taken from the 1986 National Screener Survey; waste management processing schemes and waste types managed in each facility were based on the Hazardous Waste Data Management System's (HWDMS) RCRA part A applications; the National Survey of Hazardous Waste Generators and Treatment, Storage, and Disposal Facilities Regulated Under RCRA in 1981 (Westat Survey); and the 1986 National Screener Survey.

In revising the methodology applied in assessing cancer risks, EPA conducted facility-specific HEM computer runs for nearly all of the 448 WSTF that reported, in the 1986 National Screener Survey, recycling and/or reuse of solvents and other organic compounds (i.e., TSDF expected to have the specified process vents) and for each of the more than 1,400 TSDF in the industry profile of 2,300 TSDF that were determined to manage wastes with at least 10 percent organic content. These HEM results were used to estimate nationwide cancer incidence for both TSDF equipment leaks and process vents.

The nationwide annual incidence resulting from uncontrolled TSDF equipment leaks is estimated at 1.1 cases of cancer per year. Based on the estimated lower-bound emission rates, the nationwide cancer incidence from uncontrolled process vents is 0.015 case/yr. Based on the upper-bound emission rate, the incidence from process vents is 0.38 case/yr. With the application of the final process vent standards, based on lower-bound emission rates, the annual cancer incidence will be reduced to 0.001 from 0.015 case/yr. Based on upper-bound emission rates, annual incidence will be reduced to 0.027 case/yr from 0.38 case/yr. With the implementation of the LDAR programs for equipment leak emissions, the annual cancer incidence associated with fugitive emissions will be reduced to about 0.32 case/yr.

TABLE 1. SUMMARY OF NATIONWIDE ENVIRONMENTAL AND HEALTH RISK IMPACTS OF TSDF AIR EMISSION REGULATIONS

ESDF source category	Nationwide emissions, Mg/yr		Annual incidence [a], cases/yr		Maximum individual risk [a]	
	Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
Process vents [b]						
Lower bound	300	270	0.015	0.001	3×10^{-5}	2×10^{-6}
Upper bound	8,100	900	0.38	0.027	8×10^{-4}	4×10^{-5}
Equipment leaks	26,200	7,200	1.1	0.32	5×10^{-3}	1×10^{-3}

[a] Annual incidence and MIR are based on an emission-weighted average unit risk factor for TSDF.
[b] The lower- and upper-bound process vent emission estimates reflect the range of primary condensers' removal efficiencies and the use of secondary condensers on some primary condenser vents.

The HEM results were also used to estimate the MIR for process vents. For estimates of MIR associated with TSDF equipment leaks, a separate methodology was used for reasons discussed below.

There are three major problems in applying the methodology used to estimate cancer incidence, a nationwide value, to estimate MIR from equipment leaks, a site-specific value. The first problem concerns the emission estimation technique. Equipment count, and not the amount of waste handled, is the major determining factor for emission estimates from equipment leaks. Equipment counts do not double or triple accordingly as throughput is increased. Because the size of the model plant (and thus the equipment count) assigned to a waste management process was based on the amount of waste handled, emissions from equipment leaks will be overstated for larger facilities and understated for smaller facilities. This averages out on a nationwide basis, but individual facility estimates are not considered accurate for estimates of MIR.

The second problem deals with the waste compositions and forms (e.g., wastewater and concentrated organics) attributed to each RCRA waste code (e.g., F001). A waste code may involve wastes in several forms. The determination of impacts was based on the national average waste form distribution for each particular waste code occurring at each facility. For example, if on average across the Nation, a particular organic waste solvent appears as an aqueous waste (very dilute organics) 20 percent of the time, as a sludge 50 percent of the time, and as an organic liquid 30 percent of the time, those percentages were applied to every facility that was identified to handle that type of waste regardless of the actual percentages of waste form found at the facility. In some cases, this resulted in larger facilities being assigned a much greater percentage of an organic liquid form than would actually be the case. Again, this averages out on a nationwide basis, but for site-specific estimates such as MIR more refined determinations are required.

The third problem with using the HEM for equipment leaks is that the HEM does not model area sources directly; it collocates all emission sources at one central point and models the emissions as point sources. This is appropriate for estimates for process vents that are actual point sources, but not for equipment leaks. A typical TSDF would have several hundred equipment components with the potential for leaks that could be located over the entire facility area.

In estimating MIR for equipment leaks, EPA based its hypothetical, reasonable worst-case facility, in large part, on an actual facility. The EPA was able to characterize the facility in sufficient detail that dispersion estimates could be generated using a true area source dispersion model. This was possible because more detailed site-specific information has become available on a limited basis since proposal. The preliminary results of a multiyear project to collect information on the Nation's generation of hazardous waste and the capacity available to treat, store, dispose of, and recycle that waste were used as the basis of the analysis. In the survey, all active treatment, storage, disposal, and recycling facilities (TSDR) were sent a detailed package of questionnaires appropriate to the processes they operate. The completed questionnaires were reviewed for technical accuracy; after independent verification, the information collected was entered into a complex data base. The TSDR survey questionnaire responses contain the most detailed up-to-date nationwide information regarding the hazardous waste management technologies each facility has on site. For each facility, detailed information is available in the data base, including facility area, numbers of hazardous waste management units by process type (i.e., number of surface impoundments, incinerators, recycling units), annual throughput by process unit, and types of waste (i.e., RCRA waste codes) managed by each unit at the facility. The availability of this information in computerized format made it possible to use the TSDR survey data base to identify facilities that represent the population of worst-case facilities with regard to equipment leak emissions and the potential for high MIR values. A detailed discussion of the health impacts methodologies is presented in appendix B of the BID.

The MIR estimate was made first by screening detailed TSDR Survey data for more than 1,400 TSDF to identify the facility that has the highest potential equipment leak emissions and the highest potential for these emissions to result in high ambient air concentrations (i.e., high emissions on a small facility area). Next, it was assumed that this facility handles hazardous wastes that have carcinogens with an emission-weighted potency equal to that of the nationwide average and that an individual was residing at the shortest distance from the TSDF management units to the nearest apparent residence. The highest annual-average ambient concentration, resulting from this high emission-rate facility, predicted to occur at the residence nearest the facility was then determined by dispersion modeling. The Industrial Source Complex Long-Term (ISCLT) dispersion model was used in the equipment leak MIR analysis to model the worst-case facility as a true area source with the actual facility area of about 1 acre as input. The highest annual average out of the results of 5 years of meteorological data modeled for each of the eight cities used to characterize nationwide meteorology was selected for use in the MIR calculation. Thus, this MIR estimate is considered a reasonable worst-case estimate for the industry and should not be interpreted to represent a known risk posed by any actual facility in the industry.

The MIR resulting from TSDF baseline (or uncontrolled) equipment leak emissions is estimated at 5×10^{-3}, i.e., 5 chances in 1,000. Based on the estimated lower-bound emission rates for process vents, the MIR for uncontrolled process vents is about 3 chances in 100,000 (3×10^{-5}); based on the upper-bound emission rate, the MIR is 8×10^{-4}. Because of the uncertainties inherent in nationwide emission and risk estimates that must characterize the many different constituents present in a variety of TSDF operations, EPA considered the upper-bound estimates in its decisionmaking.

With the application of the final process vent standards, based on lower-bound emission rates, the MIR will be reduced to 2×10^{-6} from 3×10^{-5}. Based on the upper-bound emission rates, the MIR will be reduced to 4×10^{-5} from 8×10^{-4}. With the implementation of control requirements for equipment leak emissions that include monthly LDAR requirements for pumps and valves, caps for open-ended lines, closed-purge sampling, and rupture discs for pressure relief devices, the MIR associated with fugitive emissions will be reduced to about 1×10^{-3} from 5×10^{-3}. Appendix B of the BID, EPA 450/3-89-009, presents a detailed explanation of the derivation of these risk estimates.

The MIR estimate for equipment leaks is sensitive to several factors. Emissions are the most obvious factor controlling risk. The facility associated with the reported MIR for equipment leaks is one of the highest emitting TSDF in terms of equipment leaks, in the upper 99.5 percent for potential equipment leak emissions. If the analysis were to use the 85-percentile emissions (i.e., 85 percent of the TSDF nationwide have lower equipment leak emissions than this value), then MIR would drop from 1×10^{-3} to 5×10^{-4} with all other factors held constant.

Another factor affecting the MIR estimates is area of the emitting source. For these types of sources, risk is inversely proportional to the area of the emitting source. For example, given equal emissions, a facility located over 10 acres generally poses less risk than a facility on 1 acre. For the facility presenting the highest risk in this rule, the MIR would drop from 1×10^{-3} to 2×10^{-4} if 10 acres were used in the estimate rather than 1 acre. It should also be pointed out that for the more than 1,400 TSDF surveyed in the EPA 1987 TSDR Survey, the median facility area was greater than 50 acres.

Distance to the nearest resident is another key variable in the risk estimate. The actual distance to the nearest residence (i.e., 250 ft) for the worst-case facility was used in calculating the reported MIR value; however, the median distance in a random sample of distances to the nearest residence reported in a survey of the hazardous waste generators was 1,000 ft. If this median distance were used in the estimate, even with the high emissions and the small area, the maximum risk value would drop from 1×10^{-3} to 2×10^{-4}. Meteorology is also a factor; the worst-case dispersion was used in the reported estimate. If an average case were used, then risk would drop to 6×10^{-4} with all other factors held constant.

As the above examples show, facilities with anything other than the combined worst-case factors would pose significantly less risk than the MIR reported for equipment leaks. The MIR estimates presented are, for the most part, based on worst-case or conservative assumptions; the one exception is the weighted-average cancer potency value, or unit risk factor (URF), used. The EPA believes it is unreasonable to make all worst-case assumptions for a single facility. However, because of the overall conservative nature of the analysis, for the industry as a whole, the vast majority of TSDF would pose significantly lower risk from equipment leak emissions than the reported reasonable, worst-case value.

F. Cost Impacts

The EPA developed a detailed estimate of the total capital investment, annual operating costs, and total annual costs of each emission control technology applied to each affected waste management unit. Total capital investment represents the total original cost of the installed control device. Total annual cost represents the total payment each year to repay the capital investment for the control device as well as to pay for the control device (or work practice) operating and maintenance expenses. The costs of attaining the 95-percent control or emission reduction for process vents are based on the use of condensers to control process vent streams for which condensation is technically feasible and on the use of carbon adsorption systems to control the remaining process vent streams subject to the regulations. Because site-specific information was insufficient to determine which facilities could apply condensers rather than carbon adsorbers industry-wide, upper- and lower-bound cost estimates were generated for process vent controls. The upper-bound cost estimates are based on the assumption that fixed-bed, regenerable carbon adsorption systems would be required to control process vents at all facilities with emissions above the emission rate limit. Similarly, the lower-bound cost estimate is based on the assumption that condensers could be used to control process vents at all facilities with emissions above the emission rate limit.

The nationwide capital investment and total annual cost of implementing the requirements of today's rule for process vent controls are estimated at $24.6 million and $12.9 million/year, respectively, for the upper-bound case. For the lower-bound case, capital investment is $1.5 million and total annual costs represent a small savings of $70,000/yr. These costs are based on an industry profile that includes 73 large recycling facilities and 167 medium-sized recycling facilities. The more than 200 small recycling facilities are not included in the cost estimates because they are projected not to have to install additional controls to meet the facility emission rate limit.

The capital investment and total annual costs of controlling TSDF equipment leak emissions with the LDAR program together with some equipment specifications are estimated at $126.6 million and $32.9 million/yr. respectively. Table 2 summarizes capital and annual costs associated with the final rules.

Further information on the economic impacts of the final standards for organic control from TSDF process vents and equipment leaks is presented in section VIII of this preamble. Details of the analysis are presented in the BID, chapter 9.0.

TABLE 2.—SUMMARY OF NATIONWIDE COST IMPACTS OF TSDF AIR EMISSION REGULATIONS

TSDF source category	Nationwide capital cost, $ millions (1986)	Nationwide annualized cost[a], $ millions/yr
Process vents[b]		
Lower bound	1.5	(0.1)
Upper bound	24.6	12.9
Equipment leaks	126.6	32.9

( ) indicates a cost credit.

[a] Includes a recovery credit for recycling. No recovery credit was applied for TSDF without recycling processes.

[b] The lower-bound cost estimates assume that condensers could be used to control process vents at all facilities with emissions above the emission rate limit; the upper-bound cost estimates assume that carbon adsorbers would be required to control process vents at all facilities with emissions above the emission rate limit.

VIII. State Authorization

A. Applicability of Rules in Authorized States

Under section 3006 of RCRA, EPA may authorize qualified States to administer and enforce the RCRA program within the State. (See 40 CFR part 271 for the standards and requirements for authorization.) Following authorization, EPA retains enforcement authority under sections 3008, 7003, and 3013 of RCRA, although authorized States have primary enforcement responsibility under section 7002.

Prior to the HSWA of 1984, a State with final authorization administered its hazardous waste program entirely 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 in the State 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 timeframes. New Federal requirements did not take effect in an authorized State until the State adopted the requirements as State law.

In contrast, under section 3006(g)(1) of RCRA, 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. The EPA is directed to carry out those requirements and prohibitions in authorized States, including the issuance of permits, until the State is granted authorization to do so. While States must still adopt HSWA-related provisions as State law to retain final authorization, the HSWA requirements apply in authorized States in the interim.

B. Effect on State Authorizations

Today's rule is promulgated pursuant to section 3004(n) of RCRA, a provision added by HSWA. Therefore, EPA is adding the requirements 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 authorization status. States may apply for either interim or final authorization for the HSWA provisions identified in Table 1, as discussed in this section of the preamble.

The EPA will implement today's rule in authorized States until (1) they modify their programs to adopt these rules and receive final authorization for the modification or (2) they receive interim authorization as described below. Because this rule is promulgated pursuant to HSWA, a State submitting a program modification may apply to receive either interim or final authorization under section 3006(g)(2) or section 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 all HSWA interim authorizations will expire automatically on January 1, 1993 (see 40 CFR 271.24(c)).

Section 271.21(e)(2) requires that authorized States must modify their programs to reflect Federal program changes and must subsequently submit the modifications to EPA for approval. The deadline for State program modifications for this rule is July 1, 1991 (or July 1, 1992, if a State statutory change is needed). These deadlines can be extended in certain cases [40 CFR 271.21(e)(3)). Once EPA approves the modification, the State requirements become subtitle C RCRA requirements.

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

States that are authorized for RCRA may already have requirements under State law similar to those in today's rules. These State regulations have not been assessed against the Federal regulations being promulgated 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 cooperative 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.

IX. Implementation

As proposed, the air emission standards for process vents and equipment leaks were included as subpart C of part 269, Air Emission Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities. Part 269 was to be added to the CFR with the promulgation of these standards. For consistency with standards for other TSDF sources under RCRA, the final standards have been incorporated into parts 264 and 265. Subpart AA applies to process vents and subpart BB to equipment leaks. In addition, whereas at proposal the equipment leak requirements of 40 CFR part 61, subpart V, were incorporated by reference, these provisions have been included in subpart BB with revisions appropriate for a standard promulgated under RCRA authority rather than CAA authority.

Under the current RCRA permitting system, a facility that has received a final permit must comply with all of the following requirements as specified in 40 CFR 270.4: (1) The specific conditions written into the permit (including conditions that demonstrate compliance with part 264 regulations); (2) self-implementing statutory requirements; and (3) regulations promulgated under 40 CFR part 268 restricting the placement of hazardous waste in or on the land. When new regulations are promulgated after the issuance of a permit, EPA may reopen the permit to incorporate the new requirements as stated in § 270.41. Otherwise, the new regulatory requirements are incorporated into a facility's permit at the time of permit reissuance, or at the 5-year review for land disposal facilities.

Facilities that have not been issued a final permit and that have fully complied with the requirements for interim status must comply with the regulations specified in CFR part 265. New regulations that are added to part 265 become applicable to interim status facilities on their effective dates.

Although EPA has the authority to reopen permits to incorporate the requirements of new standards, EPA is concerned about the resource burdens of this approach. To reopen permits for each new regulation at the time it is promulgated would impose a large administrative burden on both EPA and the regulated community because a major permit modification would generally require the same administrative procedures as are required for initial permits (e.g., development of a draft permit, public notice, and opportunity for public hearing). As a consequence, the requirements of new standards are usually incorporated into a permit when it is renewed. For standards implemented through the RCRA permit system, the effect of this policy is to "shield" facilities that have been issued a final permit from any requirements promulgated after the issuance of the permit until the time that the permit must be renewed and the new requirements are written into the permit. Thus, this policy is often referred to as the "permit-as-a-shield" policy. Although this policy is generally applied, EPA may evaluate the need to accelerate the implementation of standards developed under RCRA and, if warranted, make exceptions to the permit-as-a-shield policy. In today's rules, the permit-as-a-shield provision applies to control of air emissions from process vents and equipment leaks regulated under section 3004(n). However, as previously noted, in the Phase 11 TSDF air rules, EPA intends to propose modifications to permit-as-a-shield provisions as they apply to control of air emissions under these new subparts. With this proposed action, air rules promulgated under RCRA section 3004(n) would be applicable to all facilities, regardless of permit status.

Both interim status and permitted facilities must comply with the substantive control requirements of the final standards. However, facilities that have already been issued a final permit prior to the effective date of today's final rules are not required to comply with the rules until such time as the permit is reviewed or is reissued. Interim status facilities that have submitted their part B permit application are required to modify their part B applications to incorporate the requirements of today's rules.

The EPA considers that the part 265 standards promulgated here can be satisfied without the need for detailed explanation or negotiation between the facility owner/operator and EPA and therefore, interim status facilities can comply without awaiting permit action. The self-implementing nature of these rules is achieved by including specific criteria for facility owners or operators to identify waste management units that are subject to the regulation and by clearly specifying the emission control and administrative requirements of the rules.

The criteria for applicability are that certain hazardous waste management units at new and existing TSDF that need authorization to operate under RCRA section 3005 are covered by the rules. The applicability includes all hazardous waste management units and recycling units at facilities that require RCRA permits. For the equipment leak standards to apply, the equipment must contain or contact hazardous wastes with a 10-percent-or-more total organics concentration. For the process vent standards to apply, the vents must be associated with specific hazardous waste management units, i.e., distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations, that manage wastes with 10 ppmw or greater total organics concentration.

Control requirements in the final regulation include specific design requirements for equipment and specific performance criteria (i.e., a weight-percent reduction and a volume concentration limit) for emission control devices. Provisions of the final standards also list specific types of equipment required. Owners and operators who use one of the listed types of equipment within the specified design and operational parameters would therefore be in compliance with the regulation as long as the required design, inspection, monitoring, and maintenance provisions were met. Specifications for emission controls that achieve at least a 95-weight-percent reduction in volatile organic emissions are somewhat less specific, but engineering design practices are sufficiently established that the combination of a good control device design and subsequent monitoring of operating parameters, as required by the final regulation, would offer reasonable assurance that the specified emission reduction is being achieved. Regardless of the type of control selected, owners and operators must maintain their own records of control device design, installation, and monitoring and must submit reports identifying exceeders of monitored control device parameters. Periodic review of the required reports and records by EPA may be used to ensure compliance.

Because today's rules are promulgated under HSWA, all affected facilities must comply with these requirements on the effective date of the rule, regardless of the authorization status of the State in which they are located. In addition, because EPA will implement these rules in every State on the effective date, all reports should be sent to the EPA Regional Offices until the State receives authorization to implement these rules. Therefore, owners and operators of TSDF with existing waste management units subject to the provisions of subparts AA and BB must achieve compliance with the process vent and equipment leak control and monitoring requirements on the effective date of these rules (i.e., 6 months following promulgation) except where compliance would require the installation of a closed-vent system and control device. Information developed under other EPA regulations has shown that in some cases, the design, construction, and installation of a closed-vent system and control device can take as long as 24 months to complete. As a result, EPA is allowing up to 24 months from the promulgation date of the regulation for existing facilities to complete installation if they are required to install a closed-vent system and control device and if they can document that installation of the emission controls cannot reasonably be expected to be completed earlier. In these circumstances, owners/operators are required to develop an implementation schedule that indicates dates by which the design, construction, and operation of the necessary emission controls will be completed. This implementation schedule must document that installation of closed-vent systems and control devices required by the final standards would be achieved within a period of no more than 2 years from today and must be included as part of the facility's operating record on the effective date of these final rules (i.e., 6 months after promulgation). Changes in the implementation schedule are allowed within the 24-month timeframe if the owner or operator documents that the change cannot reasonably be avoided.

This extension would also apply to those existing facilities that are brought under regulation because of new statutory or regulatory amendments under RCRA that render the facility subject to the provisions of subpart AA or BB (e.g., units handling wastes newly listed or identified as hazardous by EPA). That is, the owner or operator may be allowed up to 18 months from the effective date of the statutory or regulatory amendment to complete installation of a control device. However, for facilities adding new waste management units, EPA believes that the lead time involved in such actions provides adequate time for owners and operators to design, procure, and install the required controls. Therefore, all new units must comply with the rules immediately (i.e., must have control equipment installed and operating upon startup of the unit).

Under the approach discussed above, the standards promulgated today for process vents and equipment leaks would be implemented on the following schedule for existing TSDF:

—180 days following promulgation, the new subparts AA and BB standards become effective; all facilities become subject to the new standards.

—On the effective date of the standards, compliance with the standards is required. Each facility that does not have the control devices required by the standards in place and operating must have one of the following in the facility's operating record: (1) An implementation schedule indicating when the controls will be installed, or (2) a process vent emission rate determination that documents that the emission rate limit is not exceeded (therefore, controls are not required).

—No later than 18 months following the effective date (2 years following promulgation), any control devices required by the standards for process vents and equipment leaks must be installed at all facilities.

—All permits issued after the effective date must incorporate the standards.

An existing solid waste management unit may become a hazardous waste management unit requiring a RCRA permit when a waste becomes newly listed or identified as hazardous. Owners and operators of facilities not previously requiring a RCRA permit who have existing units handling newly listed or identified hazardous waste can submit a part A application and obtain interim status. The air emission standards promulgated today would be implemented at these newly regulated facilities on the following schedule:

—180 days following the date the managed waste is listed or identified as hazardous, the standards become effective; facilities become subject to the subpart AA and/or BB standards.

—On the effective date of the standards, each facility that does not have the control devices required by the process and/or equipment leak standards in place must have one of the following in the facility's operating record: (1) An implementation schedule indicating when the controls will be installed, or (2) a process vent emission rate determination that documents that the emission rate limit is not exceeded (therefore, controls are not required).

—No later than 18 months following the effective date (2 years following promulgation), the controls required by the standards must be installed at all facilities.

Newly constructed TSDF are required to submit part A and part B permit applications and to receive a final permit prior to construction as required by § 270.10. Following the effective date of the standards promulgated today, a part B application for a new facility must demonstrate compliance with the standards as contained in part 264, if applicable. Therefore, all controls required by the standards would have to be in place and operating upon startup.

Similarly, new waste management units added to existing facilities would have to be equipped with the required controls prior to startup. For a new unit added to an existing permitted facility, a permit modification would be necessary. Where a new unit is added to a facility in interim status, the owner or operator must submit a revised part A application (§ 270.72[c]), including an explanation of the need for the new unit, and then receive approval from the permitting authority.

For facilities with hazardous waste management units that previously were not subject to control requirements because the wastes in the units did not contain organics in concentrations greater than the applicability criterion of 10 ppmw or 10 percent, the owner or operator would be required to comply with all subpart AA or BB requirements on the date that the facility or waste management unit becomes affected by the rules (i.e., the date the facility begins to manage wastes in the units with organic concentrations greater than 10 ppmw for subpart AA or greater than 10 percent for subpart BB) irrespective of any change in permit status that is required by the change in waste concentration. In this situation, should the facility owner or operator elect to use a control device to comply with the process vent or equipment leak provisions, the control device must be installed and operating on the date when the unit becomes subject to the rules; the 24-month extension is not applicable in this case. For the process vent emission rate limit, the situation is somewhat different. TSDF process vents associated with the distillation/separation operations specified in the rule that manage wastes with organics concentrations of 10 ppmw or greater are affected by the regulation regardless of whether the facility emissions are above or below the emission rate limit. Therefore, any change in the facility operations that results in a TSDF going above or below the emission rate limit does not cause a change in the applicability of the facility to subpart AA. The rules require that affected TSDF reduce total process vent organic emissions from all affected vents by 95 percent or reduce the facility's total process vent emissions to or below 1.4 kg/h and 2.8 Mg/yr. One of these conditions must be met at all times; the facility's emission rate determination, which documents the facility's status regarding compliance with the process vent standards, must also at all times reflect current design and operation and wastes managed in the affected units.

The permitting authority cited by section 3005 of RCRA and codified in § 270.32(b)(2) states that permits issued under this section "* * * shall contain such terms and conditions as the Administrator or State Director determines necessary to protect human health and the environment." This section, in effect, allows permit writers to require, on a case-by-case basis, emission controls that are more stringent than those specified by a standard. This omnibus authority could be used in situations where, in the permit writer's judgment, there is an unacceptably high residual risk after application of controls required by an emission standard. As has been stated, the approach that EPA is using in today's regulatory action is to proceed with promulgation of regulations to control organic emissions and to follow this with regulations that would require more stringent controls for individual hazardous constituents or would otherwise reduce risk where necessary. Until then, permit writers should use their omnibus permitting authority to require more stringent controls at facilities where a high residual risk remains after implementation of the standards for volatile organics.

X. Administrative Requirements

A. Regulatory Impact Analysis

Executive Order No. 12291 (E.O. 12291) requires each Federal agency to determine whether a regulation is a "major" rule as defined by the order and, "to the extent permitted by law," to prepare and consider a Regulatory Impact Analysis (RIA) in connection with every major rule. Major rules are defined as those likely to result in:

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

The final rule establishes the specific emission levels and emission control programs that facilities must meet in reducing air emissions from hazardous waste management units. A complete assessment of the costs, impacts, and benefits of these rules has been conducted by EPA. This analysis indicates that the requirements of the rules for TSDF equipment leaks and process vents result in none of the economic effects set forth in section 1 of the E.O. 12291 as grounds for finding a regulation to be major. The industry-wide annualized costs of the standards are estimated to be $46 million, which is less than the $100 million established as the first criterion for a major regulation in E.O. 12291. Price increases associated with the final standards are not considered a "major increase in costs or prices" specified as the second criterion in E.O. 12291. The final standard's effect on the industry would not result in any significant adverse effects on competition, investment, productivity, employment, innovation, or the ability of U.S. firms to compete with foreign firms (the third criterion in E.O. 12291).

The final rule was submitted to the Office of Management and Budget (OMB) for review as required by E.O. 12291.

B. Regulatory Flexibility Act

Under the Regulatory Flexibility Act, whenever an Agency publishes any proposed or final rule in the **Federal Register**, it must prepare a Regulatory Flexibility Analysis (RFA) that describes the impact of the rule on small entities (i.e., small businesses, organizations, and governmental jurisdictions). This analysis is not necessary, however, if the Agency's Administrator certifies that the rule will not have a significant economic impact on a substantial number of small entities. The EPA has established guidelines for determining whether an RFA is required to accompany a rulemaking package. The guidelines state that if at least 20 percent of the universe of "small entities" is affected by the rule, then an RFA is required. In addition, the EPA criteria are used to evaluate if a regulation will have a "significant impact" on small entities. If any one of the following four criteria is met, the regulation should be assumed to have a "significant impact:"

1. Annual compliance costs increase the relevant production costs for small entities by more than 5 percent.
2. The ratio of compliance costs to sales will be 10 percent higher for small entities than for large entities.
3. Capital costs of compliance will represent a significant portion of the capital available to small entities, taking into account internal cash flow plus external financing capabilities.
4. The costs of the regulation will likely result in closures of small entities.

At proposal, EPA's Administrator certified that the rule would not have a significant impact on small businesses because the only entities subject to the rule are those required to have a permit for treatment, storage, and disposal of hazardous waste. Few, if any, of these facilities are small entities. Based on comments received at proposal, EPA reviewed this conclusion in light of the revisions made to the proposed standards and closely examined the potential impacts on the industry segment comprised primarily of small commercial recyclers. As a result of the revisions made to exempt small facilities from having to install control devices, EPA again concluded that the economic impact on small businesses will be minimal and did not prepare a formal RFA in support of the rule.

Accordingly, I hereby certify that this regulation will not have a significant impact on a substantial number of small entities. Therefore, this regulation does not require an RFA.

C. Paperwork Reduction Act

The information collection requirements contained in this rule have been approved by OMB under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and have been assigned OMB control number 2060–0195.

Public reporting burden resulting from this rulemaking is estimated to be about 9 hours per response (on average), including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Recordkeeping requirements are estimated to require 180 hours a year for each facility.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs (Paperwork Reduction Project (2060-0195)), Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

D. Supporting Documentation

The dockets for this rulemaking (Docket No. F-86-AESP-FFFFF, which covers the development of the rules up to proposal, and Docket No. F-90-AESF-FFFFF, which covers development of the final rules from proposal to promulgation) are available for public inspection at the EPA RCRA Docket Office (OS-300) in room 2427M of the U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460. The docket room is open from 9 a.m. to 4 p.m., Monday through Friday, except for Federal holidays. The public must make an appointment to review docket materials and should call (202) 475-9327 for appointments. Docket A-79-27, containing support information used in developing the National Emission Standard for Hazardous Air Pollutants; Benzene Fugitive Emissions, is available for public inspection and copying between 8 a.m. and 4 p.m., Monday through Friday, at EPA's Central Docket Section, room 2903B, Waterside Mall, 401 M Street SW., Washington, DC 20460. The public may copy a maximum of 50 pages of material from any one regulatory docket at no cost. Additional copies cost $0.20/page. The docket contains a copy of all references cited in the BID for the proposed and final rules, as well as other relevant reports and correspondence.

E. List of Subjects

40 CFR Part 260

Air stripping operation, Closed-vent system, Condenser, Control device, Distillation operation, Equipment, Fractionation operation, Process vent, Solvent extraction operation, Steam stripping operation, Thin-film evaporation operation, Vapor incinerator, Vented, Incorporation by reference.

40 CFR Part 261

Hazardous waste, Recyclable materials, Recycling, Hazardous waste management units.

40 CFR Parts 264 and 265

Hazardous waste, Treatment, storage, and disposal facilities, Air emission standards for process vents, Air emission standards for equipment leaks, Incorporation by reference, Process vents, Closed-vent systems, Control devices' Pumps, Valves, Pressure relief devices, Sampling connection systems, Open-ended lines, Alternative standards, Test methods, Recordkeeping requirements, Reporting requirements.

40 CFR Part 270

Administrative practices and procedures, Hazardous waste permit program, Process vents, Equipment leaks, Reporting and recordkeeping requirements.

40 CFR Part 271

Hazardous waste, State hazardous waste programs, Process vent and equipment leak air emission standards for TSDF.

Dated June 13, 1990.

William K. Reilly,

Administrator.

For the reasons set out in the preamble, chapter I, title 40, of the Code of Federal Regulations, parts 260, 261, 264, 265, 270, and 271, are amended as follows.

PART 260—HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL

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

Authority: 42 U.S.C. 6905, 6912(a), 6921 through 6927, 6930, 6934, 6935, 6937, 6938, and 6939.

2. Section 260.11 is amended by adding the following references to paragraph (a):

§ 260.11 References.

(a) * * *

* * * * *

"ASTM Standard Method for Analysis of Reformed Gas by Gas Chromatography," ASTM Standard D 1946-82, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Test Method for Heat of Combustion of Hydrocarbon Fuels by Bomb Calorimeter (High-Precision Method)," ASTM Standard D 2382-83, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Practices for General Techniques of Ultraviolet-Visible Quantitative Analysis," ASTM Standard E 169-87, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Practices for General Techniques of Infrared Quantitative Analysis," ASTM Standard E 168-88, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Practice for Packed Column Gas Chromatography," ASTM Standard E 260-85, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Test Method for Aromatics in Light Naphthas and Aviation Gasolines by Gas Chromatography," ASTM Standard D 2267-88, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"ASTM Standard Test Method for Vapor Pressure-Temperature Relationship and Initial Decomposition Temperature of Liquids by Isoteriscope," ASTM Standard D 2879-86, available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

"APTI Course 415: Control of Gaseous Emissions," EPA Publication EPA-450/2-81-005, December 1981, available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.

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PART 261—IDENTIFICATION AND LISTING OF HAZARDOUS WASTE

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

Authority: 42 U.S.C. 6905, 6912, 6921, 6922, and 6937.

Subpart A—General

4. In § 261.6, paragraph (c)(1) is revised and paragraphs (c)(2)(iii) and (d) are added to read as follows:

§ 261.6 Requirements for recyclable materials.

* * * * *

(c)(1) Owners or operators of facilities that store recyclable materials before they are recycled are regulated under all applicable provisions of subparts A through L, AA, and BB of parts 264 and 265, and under parts 124, 266, 268, and 270 of this chapter and the notification requirements under section 3010 of RCRA, except as provided in paragraph (a) of this section. (The recycling process itself is exempt from regulation except as provided in § 261.6(d).)

(2) * * *

(iii) Section 261.6(d) of this chapter.

(d) Owners or operators of facilities subject to RCRA permitting requirements with hazardous waste management units that recycle hazardous wastes are subject to the requirements of subparts AA and BB of part 264 or 265 of this chapter.

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

5. The authority citation for part 264 continues to read as follows:

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

Subpart B—General Facility Standards

6. Section 264.13 is amended by revising paragraph (b)(6) to read as follows:

§ 264.13 General waste analysis.

* * * * *

(b) * * *

(6) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods as specified in §§ 264.17, 264.314, 264.341, 264.1034(d), 264.1063(d), and 268.7 of this chapter.

* * * * *

7. Section 264.15 is amended by revising the last sentence of paragraph (b)(4) to read as follows:

§ 264.15 General inspection requirements.

* * * * *

(b) * * *

(4) * * * At a minimum, the inspection schedule must include the terms and frequencies called for in §§ 264.174, 264.194, 264.226, 264.253, 264.254, 264.303, 264.347, 264.602, 264.1033, 264.1052, 264.1053, and 264.1058, where applicable.

* * * * *

Subpart E—Manifest System, Recordkeeping, and Reporting

8. Section 264.73 is amended by revising paragraphs (b)(3) and (b)(6) to read as follows:

§ 264.73 Operation record.

* * * * *

(b) * * *

(3) Records and results of waste analyses performed as specified in §§ 264.13, 264.17, 264.314, 264.341, 264.1034, 264.1063, 268.4(a), and 268.7 of this chapter.

* * * * *

(6) Monitoring, testing or analytical data, and corrective action where required by subpart F and §§ 264.226, 264.253, 264.254, 264.276, 264.278, 264.280, 264.303, 264.309, 264.347, 264.602, 264.1034(c)–264.1034(f), 264.1035, 264.1063(d)–264.1063(i), and 264.1064.

* * * * *

9. Section 264.77 is amended by revising paragraph (c) to read as follows:

§ 264.77 Additional reports.

* * * * *

(c) As otherwise required by subparts F, K through N, AA, and BB.

10. 40 CFR part 264 is amended by adding subpart AA to read as follows:

Subpart AA—Air Emission Standards for Process Vents

Subpart AA—Air Emission Standards for Process Vents

§ 264.1030 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 264.1).

(b) Except for §§ 264.1034(d) and 264.1035(e), this subpart applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10-ppmw, if these operations are conducted in:

(1) Units that are subject to the permitting requirements of part 270, or

(2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

(c) If the owner or operator of process vents subject to the requirements of §§ 264.1032 through 264.1036 has received a permit under section 3005 of RCRA prior to December 21, 1990 the requirements of §§ 264.1032 through 264.1036 must be incorporated when the permit is reissued under § 124.15 or reviewed under § 270.50.

[Note: The requirements of §§ 264.1032 through 264.1036 apply to process vents on hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under §§ 261.4, 262.34, and 264.1(g) are not affected by these requirements.]

§ 264.1031 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and parts 260–266.

Air stripping operation is a desorption operation employed to transfer one or more volatile components from a liquid mixture into a gas (air) either with or without the application of heat to the liquid. Packed towers, spray towers, and bubble-cap, sieve, or valve-type plate towers are among the process configurations used for contacting the air and a liquid.

Bottoms receiver means a container or tank used to receive and collect the heavier bottoms fractions of the distillation feed stream that remain in the liquid phase.

Closed-vent system means a system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

Condenser means a heat-transfer device that reduces a thermodynamic fluid from its vapor phase to its liquid phase.

Connector means flanged, screwed, welded, or other joined fittings used to connect two pipelines or a pipeline and a piece of equipment. For the purposes of reporting and recordkeeping, connector means flanged fittings that are not covered by insulation or other materials that prevent location of the fittings.

Continuous recorder means a data-recording device recording an instantaneous data value at least once every 15 minutes.

Control device means an enclosed combustion device, vapor recovery system, or flare. Any device the primary function of which is the recovery or capture of solvents or other organics for use, reuse, or sale (e.g., a primary condenser on a solvent recovery unit) is not a control device.

Control device shutdown means the cessation of operation of a control device for any purpose.

Distillate receiver means a container or tank used to receive and collect liquid material (condensed) from the overhead condenser of a distillation unit and from which the condensed liquid is pumped to larger storage tanks or other process units.

Distillation operation means an operation, either batch or continuous, separating one or more feed stream(s) into two or more exit streams, each exit stream having component concentrations different from those in the feed stream(s). The separation is achieved by the redistribution of the components between the liquid and vapor phase as they approach equilibrium within the distillation unit.

Double block and bleed system means two block valves connected in series with a bleed valve or line that can vent the line between the two block valves.

Equipment means each valve, pump, compressor, pressure relief device, sampling connection system, open-ended valve or line, or flange, and any control devices or systems required by this subpart.

Flame zone means the portion of the combustion chamber in a boiler occupied by the flame envelope.

Flow indicator means a device that indicates whether gas flow is present in a vent stream.

First attempt at repair means to take rapid action for the purpose of stopping or reducing leakage of organic material to the atmosphere using best practices.

Fractionation operation means a distillation operation or method used to separate a mixture of several volatile components of different boiling points in successive stages, each stage removing from the mixture some proportion of one of the components.

Hazardous waste management unit shutdown means a work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit. An unscheduled work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit for less than 24 hours is not a hazardous waste management unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping operation are not hazardous waste management unit shutdowns.

Hot well means a container for collecting condensate as in a steam condenser serving a vacuum-jet or steam-jet ejector.

In gas/vapor service means that the piece of equipment contains or contacts a hazardous waste stream that is in the gaseous state at operating conditions.

In heavy liquid service means that the piece of equipment is not in gas/vapor service or in light liquid service.

In light liquid service means that the piece of equipment contains or contacts a waste stream where the vapor pressure of one or more of the components in the stream is greater than 0.3 kilopascals (kPa) at 20 °C, the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight, and the fluid is a liquid at operating conditions.

In situ sampling systems means nonextractive samplers or in-line samplers.

In vacuum service means that equipment is operating at an internal pressure that is at least 5 kPa below ambient pressure.

Malfunction means any sudden failure of a control device or a hazardous waste management unit or failure of a hazardous waste management unit to operate in a normal or usual manner, so that organic emissions are increased.

Open-ended valve or line means any valve, except pressure relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

Pressure release means the emission of materials resulting from the system pressure being greater than the set pressure of the pressure relief device.

Process heater means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that are heated to produce steam.

Process vent means any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations.

Repaired means that equipment is adjusted, or otherwise altered, to eliminate a leak.

Sensor means a device that measures a physical quantity or the change in a physical quantity, such as temperature, pressure, flow rate, pH, or liquid level.

Separator tank means a device used for separation of two immiscible liquids.

Solvent extraction operation means an operation or method of separation in which a solid or solution is contacted with a liquid solvent (the two being mutually insoluble) to preferentially dissolve and transfer one or more components into the solvent.

Startup means the setting in operation of a hazardous waste management unit or control device for any purpose.

Steam stripping operation means a distillation operation in which vaporization of the volatile constituents of a liquid mixture takes place by the introduction of steam directly into the charge.

Surge control tank means a large-sized pipe or storage reservoir sufficient to contain the surging liquid discharge of the process tank to which it is connected.

Thin-film evaporation operation means a distillation operation that employs a heating surface consisting of a large diameter tube that may be either straight or tapered, horizontal or vertical. Liquid is spread on the tube wall by a rotating assembly of blades that maintain a close clearance from the wall or actually ride on the film of liquid on the wall.

Vapor incinerator means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

Vented means discharged through an opening, typically an open-ended pipe or stack, allowing the passage of a stream of liquids, gases, or fumes into the atmosphere. The passage of liquids, gases, or fumes is caused by mechanical means such as compressors or vacuum-producing systems or by process-related means such as evaporation produced by heating and not caused by tank loading and unloading (working losses) or by natural means such as diurnal temperature changes.

§ 264.1032 Standards: Process vents.

(a) The owner or operator of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations managing hazardous wastes with organic concentrations of at least 10 ppmw shall either:

(1) Reduce total organic emissions from all affected process vents at the facility below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr), or

(2) Reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent.

(b) If the owner or operator installs a closed-vent system and control device to comply with the provisions of paragraph (a) of this section the closed-vent system and control device must meet the requirements of § 264.1033.

(c) Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of § 264.1034(c).

(d) When an owner or operator and the Regional Administrator do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the procedures in § 264.1034(c) shall be used to resolve the disagreement.

§ 264.1033 Standards: Closed-vent systems and control devices.

(a)(1) Owners or operators of closed-vent systems and control devices used to comply with provisions of this part shall comply with the provisions of this section.

(2) The owner or operator of an existing facility who cannot install a closed-vent system and control device to comply with the provisions of this subpart on the effective date that the facility becomes subject to the provisions of this subpart must prepare an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The controls must be installed as soon as possible, but the implementation schedule may allow up to 18 months after the effective date that the facility becomes subject to this subpart for installation and startup. All units that begin operation after December 21, 1990, must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 2-year implementation schedule does not apply to these units.

(b) A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95 weight percent or greater unless the total organic emission limits of § 264.1032(a)(1) for all affected process vents can be attained at an efficiency less than 95 weight percent.

(c) An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall be designed and operated to reduce the organic emissions vented to it by 95 weight percent or greater; to achieve a total organic compound concentration of 20 ppmv, expressed as the sum of the actual compounds, not carbon equivalents, on a dry basis corrected to 3 percent oxygen; or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C. If a boiler or process heater is used as the control device, then the vent stream shall be introduced into the flame zone of the boiler or process heater.

(d)(1) A flare shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (e)(1) of this section, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) A flare shall be operated with a flame present at all times, as determined by the methods specified in paragraph (f)(2)(iii) of this section.

(3) A flare shall be used only if the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or if the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (e)(2) of this section.

(4)(i) A steam-assisted or nonassisted flare shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than 18.3 m/s (60 ft/s), except as provided in paragraphs (d)(4) (ii) and (iii) of this section.

(ii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, equal to or greater than 18.3 m/s (60 ft/s) but less than 122 m/s (400 ft/s) is allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than the velocity, V_{max}, as determined by the method specified in paragraph (e)(4) of this section and less than 122 m/s (400 ft/s) is allowed.

(5) An air-assisted flare shall be designed and operated with an exit velocity less than the velocity, V_{max}, as determined by the method specified in paragraph (e)(5) of this section.

(6) A flare used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(e)(1) Reference Method 22 in 40 CFR part 60 shall be used to determine the compliance of a flare with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K\left[\sum_{i=1}^{n} C_i H_i\right]$$

where:

H_T=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 °C;

K=Constant, 1.74×10^{-7} (1/ppm) (g mol/scm) (MJ/kcal) where standard temperature for (g mol/scm) is 20 °C;

C_i=Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 in 40 CFR part 60 and measured for hydrogen and carbon monoxide by ASTM D 1946–82 (incorporated by reference as specified in § 260.11); and

H_i=Net heat of combustion of sample component i, kcal/9 mol at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D 2382–83 (incorporated by reference as specified in § 260.11) if published values are not available or cannot be calculated.

(3) The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D in 40 CFR part 60 as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

(4) The maximum allowed velocity in m/s, V_{max}, for a flare complying with paragraph (d)(4)(iii) of this section shall be determined by the following equation:

$$Log_{10}(V_{max}) = (H_T + 28.8)/31.7$$

where:

28.8=Constant,

31.7=Constant,

H_T=The net heating value as determined in paragraph (e)(2) of this section.

(5) The maximum allowed velocity in m/s, V_{max}, for an air-assisted flare shall be determined by the following equation:

$$V_{max} = 8.706 + 0.7084\ (H_T)$$

where:

8.706=Constant,

0.7084=Constant,

H_T=The net heating value as determined in paragraph (e)(2) of this section.

(f) The owner or operator shall monitor and inspect each control device required to comply with this section to ensure proper operation and maintenance of the control device by implementing the following requirements:

(1) Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control

device inlet but before the point at which the vent streams are combined.

(2) Install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor control device operation as specified below:

(i) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

(ii) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed outlet.

(iii) For a flare, a heat sensing monitoring device equipped with a continuous recorder that indicates the continuous ignition of the pilot flame.

(iv) For a boiler or process heater having a design heat input capacity less than 44 MW, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a location in the furnace downstream of the combustion zone.

(v) For a boiler or process heater having a design heat input capacity greater than or equal to 44 MW, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.

(vi) For a condenser, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the condenser, or

(B) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed at a location in the exhaust vent stream from the condenser, and a second temperature sensor shall be installed at a location in the coolant fluid exiting the condenser.

(vii) For a carbon adsorption system that regenerates the carbon bed directly in the control device such as a fixed-bed carbon adsorber, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the carbon bed, or

(B) A monitoring device equipped with a continuous recorder to measure a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.

(3) Inspect the readings from each monitoring device required by paragraphs (1) and (2) of this section at least once each operating day to check control device operation and, if necessary, immediately implement the corrective measures necessary to ensure the control device operates in compliance with the requirements of this section.

(g) An owner or operator using a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of § 264.1035(b)(4)(iii)(F).

(h) An owner or operator using a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon on a regular basis by using one of the following procedures:

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule, and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of § 264.1035(b)(4)(iii)(G), whichever is longer.

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of § 264.1035(b)(4)(iii)(G).

(i) An alternative operational or process parameter may be monitored if it can be demonstrated that another parameter will ensure that the control device is operated in conformance with these standards and the control device's design specifications.

(j) An owner or operator of an affected facility seeking to comply with the provisions of this part by using a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system is required to develop documentation including sufficient information to describe the control device operation and identify the process parameter or parameters that indicate proper operation and maintenance of the control device.

(k)(1) Closed-vent systems shall be designed for and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background and by visual inspections, as determined by the methods specified as § 264.1034(b).

(2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring, which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator.

(3) Detectable emissions, as indicated by an instrument reading greater than 500 ppm and visual inspections, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected.

(4) A first attempt at repair shall be made no later than 5 calendar days after the emission is detected.

(l) Closed-vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

§ 264.1034 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) When a closed-vent system is tested for compliance with no detectable emissions, as required in § 264.1033(k), the test shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the

procedures specified in Reference Method 21.

(4) Calibration gases shall be:

(i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(5) The background level shall be determined as set forth in Reference Method 21.

(6) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(7) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(c) Performance tests to determine compliance with § 264.1032(a) and with the total organic compound concentration limit of § 264.1033(c) shall comply with the following:

(1) Performance tests to determine total organic compound concentrations and mass flow rates entering and exiting control devices shall be conducted and data reduced in accordance with the following reference methods and calculation procedures:

(i) Method 2 in 40 CFR part 60 for velocity and volumetric flow rate.

(ii) Method 18 in 40 CFR part 60 for organic content.

(iii) Each performance test shall consist of three separate runs; each run conducted for at least 1 hour under the conditions that exist when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. For the purpose of determining total organic compound concentrations and mass flow rates, the average of results of all runs shall apply. The average shall be computed on a time-weighted basis.

(iv) Total organic mass flow rates shall be determined by the following equation:

$$E_h = Q_{2sd} \left\{ \sum_{i=1}^{n} C_i MW_i \right\} [0.0416] [10^{-6}]$$

where:

E_h = Total organic mass flow rate, kg/h;

Q_{sd} = Volumetric flow rate of gases entering or exiting control device, as determined by Method 2, dscm/h;

n = Number of organic compounds in the vent gas;

C_i = Organic concentration in ppm, dry basis, of compound i in the vent gas, as determined by Method 18;

MW_i = Molecular weight of organic compound i in the vent gas, kg/kg-mol;

0.0416 = Conversion factor for molar volume, kg-mol/m^3 (@ 293 K and 760 mm Hg);

10^{-6} = Conversion from ppm, ppm^{-1}.

(v) The annual total organic emission rate shall be determined by the following equation:

$$E_A = (E_h)(H)$$

where:

E_A = Total organic mass emission rate, kg/y;

E_h = Total organic mass flow rate for the process vent, kg/h;

H = Total annual hours of operations for the affected unit, h.

(vi) Total organic emissions from all affected process vents at the facility shall be determined by summing the hourly total organic mass emission rates (E_h as determined in paragraph (c)(1)(iv) of this section) and by summing the annual total organic mass emission rates (E_A, as determined in paragraph (c)(1)(v) of this section) for all affected process vents at the facility.

(2) The owner or operator shall record such process information as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

(3) The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as follows:

(i) Sampling ports adequate for the test methods specified in paragraph (c)(1) of this section.

(ii) Safe sampling platform(s).

(iii) Safe access to sampling platform(s).

(iv) Utilities for sampling and testing equipment.

(4) For the purpose of making compliance determinations, the time-weighted average of the results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Regional Administrator's approval, be determined using the average of the results of the two other runs.

(d) To show that a process vent associated with a hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation is not subject to the requirements of this subpart, the owner or operator must make an initial determination that the time-weighted, annual average total organic concentration of the waste managed by the waste management unit is less than 10 ppmw using one of the following two methods:

(1) Direct measurement of the organic concentration of the waste using the following procedures:

(i) The owner or operator must take a minimum of four grab samples of waste for each waste stream managed in the affected unit under process conditions expected to cause the maximum waste organic concentration.

(ii) For waste generated onsite, the grab samples must be collected at a point before the waste is exposed to the atmosphere such as in an enclosed pipe or other closed system that is used to transfer the waste after generation to the first affected distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation. For waste generated offsite, the grab samples must be collected at the inlet to the first waste management unit that receives the waste provided the waste has been transferred to the facility in a closed system such as a tank truck and the waste is not diluted or mixed with other waste.

(iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060 or 8240 of SW-846 (incorporated by reference under § 260.11).

(iv) The arithmetic mean of the results of the analyses of the four samples shall apply for each waste stream managed in the unit in determining the time-weighted, annual average total organic concentration of the waste. The time-weighted average is to be calculated using the annual quantity of each waste stream processed and the mean organic concentration of each waste stream managed in the unit.

(2) Using knowledge of the waste to determine that its total organic concentration is less than 10 ppmw. Documentation of the waste determination is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to generate a waste stream having a total organic content less than 10 ppmw, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) The determination that distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations manage hazardous wastes with time-weighted, annual average total organic concentrations less than 10 ppmw shall be made as follows:

(1) By the effective date that the facility becomes subject to the provisions of this subpart or by the date when the waste is first managed in a waste management unit, whichever is later, and

(2) For continuously generated waste, annually, or

(3) Whenever there is a change in the waste being managed or a change in the process that generates or treats the waste.

(f) When an owner or operator and the Regional Administrator do not agree on whether a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation manages a hazardous waste with organic concentrations of at least 10 ppmw based on knowledge of the waste, the procedures in Method 8240 may be used to resolve the dispute.

§ 264.1035 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For facilities that comply with the provisions of § 264.1033(a)(2), an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The schedule must also include a rationale of why the installation cannot be completed at an earlier date. The implementation schedule must be in the facility operating record by the effective date that the facility becomes subject to the provisions of this subpart.

(2) Up-to-date documentation of compliance with the process vent standards in § 264.1032, including:

(i) Information and data identifying all affected process vents, annual throughput and operating hours of each affected unit, estimated emission rates for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility), and the approximate location within the facility of each affected unit (e.g., identify the hazardous waste management units on a facility plot plan).

(ii) Information and data supporting determinations of vent emissions and emission reductions achieved by add-on control devices based on engineering calculations or source tests. For the purpose of determining compliance, determinations of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates, or vent stream organic compounds and concentrations) that represent the conditions that result in maximum organic emissions, such as when the waste management unit is operating at the highest load or capacity level reasonably expected to occur. If the owner or operator takes any action (e.g., managing a waste of different composition or increasing operating hours of affected waste management units) that would result in an increase in total organic emissions from affected process vents at the facility, then a new determination is required.

(3) Where an owner or operator chooses to use test data to determine the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan. The test plan must include:

(i) A description of how it is determined that the planned test is going to be conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. This shall include the estimated or design flow rate and organic content of each vent stream and define the acceptable operating ranges of key process and control device parameters during the test program.

(ii) A detailed engineering description of the closed-vent system and control device including:

(A) Manufacturer's name and model number of control device.

(B) Type of control device.

(C) Dimensions of the control device.

(D) Capacity.

(E) Construction materials.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(4) Documentation of compliance with § 264.1033 shall include the following information:

(i) A list of all information references and sources used in preparing the documentation.

(ii) Records including the dates of each compliance test required by § 264.1033(k).

(iii) If engineering calculations are used, a design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. Documentation provided by the control device manufacturer or vendor that describes the control device design in accordance with paragraphs (b)(4)(iii)(A) through (b)(4)(iii)(G) of this section may be used to comply with this requirement. The design analysis shall address the vent stream characteristics and control device operation parameters as specified below.

(A) For a thermal vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

(B) For a catalytic vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperatures across the catalyst bed inlet and outlet.

(C) For a boiler or process heater, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average flame zone temperatures, combustion zone residence time, and description of method and location where the vent stream is introduced into the combustion zone.

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in § 264.1033(d).

(E) For a condenser, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic compound concentration level, design average temperature of the condenser exhaust vent stream, and design average temperatures of the coolant fluid at the condenser inlet and outlet.

(F) For a carbon adsorption system such as a fixed-bed adsorber that regenerates the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level, number and capacity of carbon beds, type and working capacity of activated carbon used for carbon beds, design total steam flow over the period of each complete carbon bed regeneration cycle, duration of the carbon bed steaming and cooling/drying cycles, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of carbon.

(G) For a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic concentration level, capacity of carbon bed, type and working capacity of activated carbon used for carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule.

(iv) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(v) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 percent or greater unless the total organic concentration limit of § 264.1032(a) is achieved at an efficiency less than 95 weight percent or the total organic emission limits of § 264.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent. A statement provided by the control device manufacturer or vendor certifying that the control equipment meets the design specifications may be used to comply with this requirement.

(vi) If performance tests are used to demonstrate compliance, all test results.

(c) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of this part shall be recorded and kept up-to-date in the facility operating record. The information shall include:

(1) Description and date of each modification that is made to the closed-vent system or control device design.

(2) Identification of operating parameter, description of monitoring device, and diagram of monitoring sensor location or locations used to comply with § 264.1033 (f)(1) and (f)(2).

(3) Monitoring, operating, and inspection information required by paragraphs (f) through (k) of § 264.1033.

(4) Date, time, and duration of each period that occurs while the control device is operating when any monitored parameter exceeds the value established in the control device design analysis as specified below:

(i) For a thermal vapor incinerator designed to operate with a minimum residence time of 0.50 second at a minimum temperature of 760 °C, period when the combustion temperature is below 760 °C.

(ii) For a thermal vapor incinerator designed to operate with an organic emission reduction efficiency of 95 weight percent or greater period when the combustion zone temperature is more than 28 °C below the design average combustion zone temperature established as a requirement of paragraph (b)(4)(iii)(A) of this section.

(iii) For a catalytic vapor incinerator, period when:

(A) Temperature of the vent stream at the catalyst bed inlet is more than 28 °C below the average temperature of the inlet vent stream established as a requirement of paragraph (b)(4)(iii)(B) of this section, or

(B) Temperature difference across the catalyst bed is less than 80 percent of the design average temperature difference established as a requirement of paragraph (b)(4)(iii)(B) of this section.

(iv) For a boiler or process heater, period when:

(A) Flame zone temperature is more than 28 °C below the design average flame zone temperature established as a requirement of paragraph (b)(4)(iii)(C) of this section, or

(B) Position changes where the vent stream is introduced to the combustion zone from the location established as a requirement of paragraph (b)(4)(iii)(C) of this section.

(v) For a flare, period when the pilot flame is not ignited.

(vi) For a condenser that complies with § 264.1033(f)(2)(vi)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the condenser are more than 20 percent greater than the design outlet organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(vii) For a condenser that complies with § 264.1033(f)(2)(vi)(B), period when:

(A) Temperature of the exhaust vent stream from the condenser is more than 6 °C above the design average exhaust vent stream temperature established as a requirement of paragraph (b)(4)(iii)(E) of this section; or

(B) Temperature of the coolant fluid exiting the condenser is more than 6 °C above the design average coolant fluid temperature at the condenser outlet established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(viii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with § 264.1033(f)(2)(vii)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the carbon bed are more than 20 percent greater than the design exhaust vent stream organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(ix) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with § 264.1033(f)(2)(vii)(B), period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(5) Explanation for each period recorded under paragraph (4) of the cause for control device operating parameter exceeding the design value and the measures implemented to correct the control device operation.

(6) For a carbon adsorption system operated subject to requirements specified in § 264.1033(g) or § 264.1033(h)(2), date when existing carbon in the control device is replaced with fresh carbon.

(7) For a carbon adsorption system operated subject to requirements specified in § 264.1033(h)(1), a log that records:

(i) Date and time when control device is monitored for carbon breakthrough and the monitoring device reading.

(ii) Date when existing carbon in the control device is replaced with fresh carbon.

(8) Date of each control device startup and shutdown.

(d) Records of the monitoring, operating, and inspection information required by paragraphs (c)(3)-(c)(8) of this section need be kept only 3 years.

(e) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, the Regional Administrator will specify the appropriate recordkeeping requirements.

(f) Up-to-date information and data used to determine whether or not a process vent is subject to the requirements in § 264.1032 including supporting documentation as required by § 264.1034(d)(2) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used, shall be recorded in a log that is kept in the facility operating record.

(Approved by the Office of Management and Budget under control number 2060-0195)

§ 264.1036 Reporting requirements.

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Regional Administrator by dates specified by the Regional Administrator. The report shall include the following information:

(1) The Environmental Protection Agency identification number, name, and address of the facility.

(2) For each month during the semiannual reporting period, dates when the control device exceeded or operated outside of the design specifications as defined in § 264.1035(c)(4) and as indicated by the control device monitoring required by § 264.1033(f) and such exceedances were not corrected within 24 hours, or that a flare operated with visible emissions as defined in § 264.1033(d) and as determined by Method 22 monitoring, the duration and cause of each exceedance or visible emissions, and any corrective measures taken.

(b) If, during the semiannual reporting period, the control device does not exceed or operate outside of the design specifications as defined in § 264.1035(c)(4) for more than 24 hours or a flare does not operate with visible emissions as defined in § 264.1033(d), a report to the Regional Administrator is not required.

(Approved by the Office of Management and Budget under control number 2060-0195)

§§ 264.1037-264.1049 [Reserved].

11. 40 CFR part 264 is amended by adding subpart BB to read as follows:

Subpart BB—Air Emission Standards for Equipment Leaks

Subpart BB—Air Emission Standards for Equipment Leaks

§ 264.1050 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 264.1).

(b) Except as provided in § 264.1064(k), this subpart applies to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight that are managed in:

(1) Units that are subject to the permitting requirements of part 270, or

(2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

(c) If the owner or operator of equipment subject to the requirements of §§ 264.1052 through 264.1065 has received a permit under section 3005 of RCRA prior to December 21, 1990, the requirements of §§ 264.1052 through 264.1065 must be incorporated when the permit is reissued under § 124.15 or reviewed under § 270.50.

(d) Each piece of equipment to which this subpart applies shall be marked in such a manner that it can be distinguished readily from other pieces of equipment.

(e) Equipment that is in vacuum service is excluded from the requirements of § 264.1052 to § 264.1060 if it is identified as required in § 264.1064(g)(5).

[Note: The requirements of §§ 264.1052 through 264.1065 apply to equipment associated with hazardous waste recycling units previously exempt under § 261.6(c)(1). Other exemptions under §§ 261.4, 262.34, and 264.1(g) are not affected by these requirements.]

§ 264.1051 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260-266.

§ 264.1052 Standards: Pumps in light liquid service.

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in § 264.1063(b), except as provided in paragraphs (d), (e), and (f) of this section.

(2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.

(b)(1) If a instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(2) If there are indications of liquids dripping from the pump seal, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 264.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a) of this section, *provided* the following requirements are met:

(1) Each dual mechanical seal system must be:

(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or

(ii) Equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device that complies with the requirements of § 264.1060, or

(iii) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to the atmosphere.

(2) The barrier fluid system must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(3) Each barrier fluid system must be equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.

(4) Each pump must be checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(5)(i) Each sensor as described in paragraph (d)(3) of this section must be checked daily or be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly.

(ii) The owner or operator must determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(6)(i) If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in paragraph (d)(5)(ii) of this section, a leak is detected.

(ii) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 264.1059.

(iii) A first attempt at repair (e.g., relapping the seal) shall be made no later than 5 calendar days after each leak is detected.

(e) Any pump that is designated, as described in § 264.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump meets the following requirements:

(1) Must have no externally actuated shaft penetrating the pump housing.

(2) Must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in § 264.1063(c).

(3) Must be tested for compliance with paragraph (e)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(f) If any pump is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of § 264.1060, it is exempt from the requirements of paragraphs (a) through (e) of this section.

§ 264.1053 Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of total organic emissions to the atmosphere, except as provided in paragraphs (h) and (i) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is at all times greater than the compressor stuffing box pressure, or

(2) Equipped with a barrier fluid system that is connected by a closed-vent system to a control device that complies with the requirements of § 264.1060, or

(3) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to atmosphere.

(c) The barrier fluid must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(d) Each barrier fluid system as described in paragraphs (a) through (c) of this section shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly unless the compressor is located within the boundary of an unmanned plant site, in which case the sensor must be checked daily.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(f) If the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 264.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of § 264.1060, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in § 264.1064(g)(2), for no detectable emissions as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is determined to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 264.1063(c).

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

§ 264.1054 Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 264.1063(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in § 264.1059.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as

measured by the method specified in § 264.1063(c).

(c) Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in § 264.1060 is exempt from the requirements of paragraphs (a) and (b) of this section.

§ 264.1055 Standards: Sampling connecting systems.

(a) Each sampling connection system shall be equipped with a closed purge system or closed-vent system.

(b) Each closed-purge system or closed-vent system as required in paragraph (a) shall:

(1) Return the purged hazardous waste stream directly to the hazardous waste management process line with no detectable emissions to atmosphere, or

(2) Collect and recycle the purged hazardous waste stream with no detectable emissions to atmosphere, or

(3) Be designed and operated to capture and transport all the purged hazardous waste stream to a control device that complies with the requirements of § 264.1060.

(c) *In situ* sampling systems are exempt from the requirements of paragraphs (a) and (b) of this section.

§ 264.1056 Standards: Open-ended valves or lines.

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve.

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring hazardous waste stream flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the hazardous waste stream end is closed before the second valve is closed.

(c) When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) of this section at all other times.

§ 264.1057 Standards: Valves in gas/vapor service or in light liquid service.

(a) Each valve in gas/vapor or light liquid service shall be monitored monthly to detect leaks by the methods specified in § 264.1063(b) and shall comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section, and §§ 264.1061 and 264.1062.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) Any valve for which a leak is not detected for two successive months may be monitored the first month of every succeeding quarter, beginning with the next quarter, until a leak is detected.

(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for two successive months.

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in § 264.1059.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

(1) Tightening of bonnet bolts.

(2) Replacement of bonnet bolts.

(3) Tightening of packing gland nuts.

(4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in § 264.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

(1) Has no external actuating mechanism in contact with the hazardous waste stream.

(2) Is operated with emissions less than 500 ppm above background as determined by the method specified in § 264.1063(c).

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(g) Any valve that is designated, as described in § 264.1064(h)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section.

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in § 264.1064(h)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.

(2) The hazardous waste management unit within which the valve is located was in operation before June 21, 1990.

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

§ 264.1058 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors.

(a) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in § 264.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected. except as provided in § 264.1059.

(2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under § 264.1057(e).

§ 264.1059 Standards: Delay of repair.

(a) Delay of repair of equipment for which leaks have been detected will be allowed if the repair is technically infeasible without a hazardous waste management unit shutdown. In such a case, repair of this equipment shall occur before the end of the next hazardous waste management unit shutdown.

(b) Delay of repair of equipment for which leaks have been detected will be allowed for equipment that is isolated from the hazardous waste management unit and that does not continue to contain or contact hazardous waste with organic concentrations at least 10 percent by weight.

(c) Delay of repair for valves will be allowed if:

(1) The owner or operator determines that emissions of purged material resulting from immediate repair are greater than the emissions likely to result from delay of repair.

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with § 264.1060.

(d) Delay of repair for pumps will be allowed if:

(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system.

(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.

(e) Delay of repair beyond a hazardous waste management unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the hazardous waste management unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next hazardous waste management unit shutdown will not be allowed unless the next hazardous waste management unit shutdown occurs sooner than 6 months after the first hazardous waste management unit shutdown.

§ 264.1060 Standards: Closed-vent systems and control devices.

Owners or operators of closed-vent systems and control devices shall comply with the provisions of § 264.1033.

§ 264.1061 Alternative standards for valves in gas/vapor service or in light liquid service: percentage of valves allowed to leak.

(a) An owner or operator subject to the requirements of § 264.1057 may elect to have all valves within a hazardous waste management unit comply with an alternative standard that allows no greater than 2 percent of the valves to leak.

(b) The following requirements shall be met if an owner or operator decides to comply with the alternative standard of allowing 2 percent of valves to leak:

(1) An owner or operator must notify the Regional Administrator that the owner or operator has elected to comply with the requirements of this section.

(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Regional Administrator.

(3) If a valve leak is detected, it shall be repaired in accordance with § 264.1057(d) and (e).

(c) Performance tests shall be conducted in the following manner:

(1) All valves subject to the requirements in § 264.1057 within the hazardous waste management unit shall be monitored within 1 week by the methods specified in § 264.1063(b).

(2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(3) The leak percentage shall be determined by dividing the number of valves subject to the requirements in § 264.1057 for which leaks are detected by the total number of valves subject to the requirements in § 264.1057 within the hazardous waste management unit.

(d) If an owner or operator decides to comply with this section no longer, the owner or operator must notify the Regional Administrator in writing that the work practice standard described in § 264.1057(a) through (e) will be followed.

§ 264.1062 Alternative standards for valves in gas/vapor service or in light liquid service: skip period leak detection and repair.

(a)(1) An owner or operator subject to the requirements of § 264.1057 may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of this section.

(2) An owner or operator must notify the Regional Administrator before implementing one of the alternative work practices.

(b)(1) An owner or operator shall comply with the requirements for valves, as described in § 264.1057, except as described in paragraphs (b)(2) and (b)(3) of this section.

(2) After two consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves subject to the requirements in § 264.1057.

(3) After five consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves subject to the requirements in § 264.1057.

(4) If the percentage of valves leaking is greater than 2 percent, the owner or operator shall monitor monthly in compliance with the requirements in § 264.1057, but may again elect to use this section after meeting the requirements of § 264.1057(c)(1).

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§ 264.1063 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) Leak detection monitoring, as required in §§ 264.1052–264.1062, shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be:

(i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(5) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(c) When equipment is tested for compliance with no detectable emissions, as required in §§ 264.1052(e), 264.1053(i), 264.1054, and 264.1057(f), the test shall comply with the following requirements:

(1) The requirements of paragraphs (b)(1) through (4) of this section shall apply.

(2) The background level shall be determined as set forth in Reference Method 21.

(3) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(4) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) In accordance with the waste analysis plan required by § 264.13(b), an owner or operator of a facility must determine, for each piece of equipment, whether the equipment contains or contacts a hazardous waste with organic concentration that equals or exceeds 10 percent by weight using the following:

(1) Methods described in ASTM Methods D 2267–88, E 169–87, E 168–88, E 260–85 (incorporated by reference under § 260.11);

(2) Method 9060 or 8240 of SW–846 (incorporated by reference under § 260.11); or

(3) Application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced. Documentation of a waste determination by knowledge is required. Examples of documentation that shall

be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to have a total organic content less than 10 percent, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) If an owner or operator determines that a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the determination can be revised only after following the procedures in paragraph (d)(1) or (d)(2) of this section.

(f) When an owner or operator and the Regional Administrator do not agree on whether a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the procedures in paragraph (d)(1) or (d)(2) of this section can be used to resolve the dispute.

(g) Samples used in determining the percent organic content shall be representative of the highest total organic content hazardous waste that is expected to be contained in or contact the equipment.

(h) To determine if pumps or valves are in light liquid service, the vapor pressures of constituents may be obtained from standard reference texts or may be determined by ASTM D-2879-86 (incorporated by reference under § 260.11).

(i) Performance tests to determine if a control device achieves 95 weight percent organic emission reduction shall comply with the procedures of § 264.1034(c)(1) through (c)(4).

§ 264.1064 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For each piece of equipment to which Subpart BB of Part 264 applies:

(i) Equipment identification number and hazardous waste management unit identification.

(ii) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

(iii) Type of equipment (e.g., a pump or pipeline valve).

(iv) Percent-by-weight total organics in the hazardous waste stream at the equipment.

(v) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(vi) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(2) For facilities that comply with the provisions of § 264.1033(a)(2), an implementation schedule as specified in § 264.1033(a)(2).

(3) Where an owner or operator chooses to use test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(4) Documentation of compliance with § 264.1060, including the detailed design documentation or performance test results specified in § 264.1035(b)(4).

(c) When each leak is detected as specified in §§ 264.1052, 264.1053, 264.1057, and 264.1058, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, the date evidence of a potential leak was found in accordance with § 264.1058(a), and the date the leak was detected, shall be attached to the leaking equipment.

(2) The identification on equipment, except on a valve, may be removed after it has been repaired.

(3) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in §§ 264.1057(c) and no leak has been detected during those 2 months.

(d) When each leak is detected as specified in §§ 264.1052, 264.1053, 264.1057, and 264.1058, the following information shall be recorded in an inspection log and shall be kept in the facility operating record:

(1) The instrument and operator identification numbers and the equipment identification number.

(2) The date evidence of a potential leak was found in accordance with § 264.1058(a).

(3) The date the leak was detected and the dates of each attempt to repair the leak.

(4) Repair methods applied in each attempt to repair the leak.

(5) "Above 10,000" if the maximum instrument reading measured by the methods specified in § 264.1063(b) after each repair attempt is equal to or greater than 10,000 ppm.

(6) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(7) Documentation supporting the delay of repair of a valve in compliance with § 264.1059(c).

(8) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a hazardous waste management unit shutdown.

(9) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days.

(10) The date of successful repair of the leak.

(e) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of § 264.1060 shall be recorded and kept up-to-date in the facility operating record as specified in § 264.1035(c). Design documentation is specified in § 264.1035 (c)(1) and (c)(2) and monitoring, operating, and inspection information in § 264.1035(c)(3)-(c)(8).

(f) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, the Regional Administrator will specify the appropriate recordkeeping requirements.

(g) The following information pertaining to all equipment subject to the requirements in §§ 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for equipment (except welded fittings) subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, under the provisions of §§ 264.1052(e), 264.1053(i), and 264.1057(f).

(ii) The designation of this equipment as subject to the requirements of §§ 264.1052(e), 264.1053(i), or 264.1057(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with § 264.1054(a).

(4)(i) The dates of each compliance test required in §§ 264.1052(e), 264.1053(i), 264.1054, and 264.1057(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(h) The following information pertaining to all valves subject to the requirements of § 264.1057 (g) and (h) shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

(2) A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.

(i) The following information shall be recorded in the facility operating record for valves complying with § 264.1062:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(j) The following information shall be recorded in a log that is kept in the facility operating record:

(1) Criteria required in § 264.1052(d)(5)(ii) and § 264.1053(e)(2) and an explanation of the design criteria.

(2) Any changes to these criteria and the reasons for the changes.

(k) The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions as provided in the applicability section of this subpart and other specific subparts:

(1) An analysis determining the design capacity of the hazardous waste management unit.

(2) A statement listing the hazardous waste influent to and effluent from each hazardous waste management unit subject to the requirements in §§ 264.1052 through 264.1060 and an analysis determining whether these hazardous wastes are heavy liquids.

(3) An up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements in §§ 264.1052 through 264.1060. The record shall include supporting documentation as required by § 264.1063(d)(3) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used. If the owner or operator takes any action (e.g., changing the process that produced the waste) that could result in an increase in the total organic content of the waste contained in or contacted by equipment determined not to be subject to the requirements in §§ 264.1052 through 264.1060, then a new determination is required.

(l) Records of the equipment leak information required by paragraph (d) of this section and the operating information required by paragraph (e) of this section need be kept only 3 years.

(m) The owner or operator of any facility that is subject to this subpart and to regulations at 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to determine compliance with this subpart by documentation either pursuant to § 264.1064 of this subpart, or pursuant to those provisions of 40 CFR part 60 or 61, to the extent that the documentation under the regulation at 40 CFR part 60 or part 61 duplicates the documentation required under this subpart. The documentation under the regulation at 40 CFR part 60 or part 61 shall be kept with or made readily available with the facility operating record.

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§ 264.1065 Reporting requirements.

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Regional Administrator by dates specified by the Regional Administrator. The report shall include the following information:

(1) The Environmental Protection Agency identification number, name, and address of the facility.

(2) For each month during the semiannual reporting period:

(i) The equipment identification number of each valve for which a leak was not repaired as required in § 264.1057(d).

(ii) The equipment identification number of each pump for which a leak was not repaired as required in § 264.1052 (c) and (d)(6).

(iii) The equipment identification number of each compressor for which a leak was not repaired as required in § 264.1053(g).

(3) Dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period.

(4) For each month during the semiannual reporting period, dates when the control device installed as required by § 264.1052, 264.1053, 264.1054, or 264.1055 exceeded or operated outside of the design specifications as defined in § 264.1064(e) and as indicated by the control device monitoring required by § 264.1060 and was not corrected within 24 hours, the duration and cause of each exceedance, and any corrective measures taken.

(b) If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required in §§ 264.1057 (d), 264.1052 (c) and (d)(6), and 264.1053 (g), respectively, and the control device does not exceed or operate outside of the design specifications as defined in § 264.1064(e) for more than 24 hours, a report to the Regional Administrator is not required.

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§§ 264.1066-264.1079 [Reserved]

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

12. The authority citation for part 265 continues to read as follows:

Authority: 42 U.S.C. 6095, 6912(a), 6924, 6925, and 6935.

Subpart B—General Facility Standards

13. Section 265.13 is amended by revising paragraph (b)(6) to read as follows:

§ 265.13 General waste analysis.

* * * * *

(b) * * *

(6) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods as specified in §§ 265.193, 265.225, 265.252, 265.273, 265.314, 265.341, 265.375, 265.402, 265.1034(d), 265.1063(d), and 268.7 of this chapter.

14. Section 265.15 is amended by revising the last sentence of paragraph (b)(4) to read as follows:

§ 265.15 General inspection requirements.

* * * * *

(b) * * *

(4) * * * At a minimum, the inspection schedule must include the terms and frequencies called for in §§ 265.174, 265.193, 265.195, 265.226, 265.347, 265.377, 265.403, 265.1033, 265.1052, 265.1053, and 265.1058.

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Subpart E—Manifest System, Recordkeeping, and Reporting

15. Section 265.73 is amended by revising paragraphs (b)(3) and (b)(6) to read as follows:

§ 265.73 Operating record.

* * * * *

(b) * * *

(3) Records and results of waste analyses and trial tests performed as specified in §§ 265.13, 265.193, 265.225, 265.252, 265.273, 265.314, 265.341, 265.375, 265.402, 265.1034, 265.1063, 268.4(a), and 268.7 of this chapter.

* * * * *

(6) Monitoring, testing or analytical data when required by §§ 265.90, 265.94, 265.191, 265.193, 265.195, 265.276, 265.278, 265.280(d)(1), 265.347, 265.377, 265.1034(c)–265.1034(f), 265.1035, 265.1063(d)–265.1063(i), and 265.1064.

* * * * *

16. Section 265.77 is amended by adding paragraph (d) as follows:

§ 265.77 Additional reports.

* * * * *

(d) As otherwise required by Subparts AA and BB.

17. 40 CFR part 265 is amended by adding Subpart AA to read as follows:

Subpart AA—Air Emission Standards for Process Vents

Subpart AA—Air Emission Standards for Process Vents

§ 265.1030 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 265.1).

(b) Except for §§ 265.1034(d) and 265.1035(d), this subpart applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10 ppmw, if these operations are conducted in:

(1) Units that are subject to the permitting requirements of part 270, or

(2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

[Note: The requirements of §§ 265.1032 through 265.1036 apply to process vents on hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under §§ 261.4, 262.34, and 265.1(c) are not affected by these requirements.]

§ 265.1031 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260–266.

§ 265.1032 Standards: Process vents.

(a) The owner or operator of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction or air or steam stripping operations managing hazardous wastes with organic concentrations at least 10 ppmw shall either:

(1) Reduce total organic emissions from all affected process vents at the facility below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr), or

(2) Reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent.

(b) If the owner or operator installs a closed-vent system and control device to comply with the provisions of paragraph (a) of this section, the closed-vent system and control device must meet the requirements of § 265.1033.

(c) Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of § 265.1034(c).

(d) When an owner or operator and the Regional Administrator do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the test methods in § 265.1034(c) shall be used to resolve the disagreement.

§ 265.1033 Standards: Closed-vent systems and control devices.

(a)(1) Owners or operators of closed-vent systems and control devices used to comply with provisions of this part shall comply with the provisions of this section.

(2) The owner or operator of an existing facility who cannot install a closed-vent system and control device to comply with the provisions of this subpart on the effective date that the facility becomes subject to the provisions of this subpart must prepare an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The controls must be installed as soon as possible, but the implementation schedule may allow up to 18 months after the effective date that the facility becomes subject to this subpart for installation and startup. All units that begin operation after December 21, 1990 must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 2-year implementation schedule does not apply to these units.

(b) A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95 weight percent or greater unless the total organic emission limits of § 265.1032(a)(1) for all affected process vents can be attained at an efficiency less than 95 weight percent.

(c) An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall be designed and operated to reduce the organic emissions vented to it by 95 weight percent or greater; to achieve a total organic compound concentration of 20 ppmv, expressed as the sum of the actual compounds, not carbon equivalents, on a dry basis corrected to 3 percent oxygen; or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C. If a boiler or process heater is used as the control device, then the vent stream shall be introduced into the flame combustion zone of the boiler or process heater.

(d)(1) A flare shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (e)(1) of this section, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) A flare shall be operated with a flame present at all times, as determined by the methods specified in paragraph (f)(2)(iii) of this section.

(3) A flare shall be used only if the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater, if the flare is steam-assisted or air-assisted; or if the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (e)(2) of this section.

(4)(i) A steam-assisted or nonassisted flare shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, of less than 18.3 m/s (60 ft/s), except as provided in paragraphs (d)(4) (ii) and (iii) of this section.

(ii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, equal to or greater than 18.3 m/s (60 ft/s) but less than 122 m/s (400 ft/s) is allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than the velocity, V_{max}, as determined by the method specified in paragraph (e)(4) of this section, and less than 122 m/s (400 ft/s) is allowed.

(5) An air-assisted flare shall be designed and operated with an exit velocity less than the velocity, V_{max}, as determined by the method specified in paragraph (e)(5) of this section.

(6) A flare used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(e)(1) Reference Method 22 in 40 CFR part 60 shall be used to determine the compliance of a flare with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \left[\sum_{i=1}^{n} C_i H_i \right]$$

where:

H_T=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 °C;

K=Constant, 1.74×10^{-7} (1/ppm) (g mol/scm) (MJ/kcal) where standard temperature for (g mol/scm) is 20 °C;

C_i=Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 in 40 CFR part 60 and measured for hydrogen and carbon monoxide by ASTM D 1946-82 (incorporated by reference as specified in § 260.11); and

H_i=Net heat of combustion of sample component i, kcal/g mol at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D 2382-83 (incorporated by reference as specified in § 260.11) if published values are not available or cannot be calculated.

(3) The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D in 40 CFR part 60 as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

(4) The maximum allowed velocity in m/s, V_{max}, for a flare complying with paragraph (d)(4)(iii) of this section shall be determined by the following equation:

$$\text{Log}_{10}(V_{max}) = (H_T + 28.8)/31.7$$

where:

H_T=The net heating value as determined in paragraph (e)(2) of this section.

28.8=Constant.

31.7=Constant.

(5) The maximum allowed velocity in m/s, V_{max}, for an air-assisted flare shall be determined by the following equation:

$$V_{max} = 8.706 + 0.7084 (H_T)$$

where:

8.706 = Constant.

0.7084 = Constant.

H_T = The net heating value as determined in paragraph (e)(2) of this section.

(f) The owner or operator shall monitor and inspect each control device required to comply with this section to ensure proper operation and maintenance of the control device by implementing the following requirements:

(1) Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control device inlet, but before being combined with other vent streams.

(2) Install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor control device operation as specified below:

(i) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

(ii) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed outlet.

(iii) For a flare, a heat sensing monitoring device equipped with a continuous recorder that indicates the continuous ignition of the pilot flame.

(iv) For a boiler or process heater having a design heat input capacity less than 44 MW, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. The temperature sensor shall be installed at a location in the furnace downstream of the combustion zone.

(v) For a boiler or process heater having a design heat input capacity greater than or equal to 44 MW, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.

(vi) For a condenser, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the condenser; or

(B) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ±1 percent of the temperature being monitored in °C or ±0.5 °C, whichever is greater. One temperature sensor shall be installed at a location in the exhaust vent stream from the condenser, and a second temperature sensor shall be installed at a location in the coolant fluid exiting the condenser.

(vii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly in the control device, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the carbon bed, or

(B) A monitoring device equipped with a continuous recorder to measure a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.

(3) Inspect the readings from each monitoring device required by paragraphs (f) (1) and (2) of this section at least once each operating day to check control device operation and, if necessary, immediately implement the corrective measures necessary to ensure the control device operates in compliance with the requirements of this section.

(g) An owner or operator using a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device, shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of § 265.1035(b)(4)(iii)(F).

(h) An owner or operator using a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon on a regular basis by using one of the following procedures:

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of § 265.1035(b)(4)(iii)(G), whichever is longer.

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of § 265.1035(b)(4)(iii)(G).

(i) An owner or operator of an affected facility seeking to comply with the provisions of this part by using a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system is required to develop documentation including sufficient information to describe the control device operation and identify the process parameter or parameters that indicate proper operation and maintenance of the control device.

(j)(1) Closed-vent systems shall be designed for and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background and by visual inspections, as determined by the methods specified as § 265.1034(b).

(2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator.

(3) Detectable emissions, as indicated by an instrument reading greater than 500 ppm and visual inspections, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected.

(4) A first attempt at repair shall be made no later than 5 calendar days after the emission is detected.

(k) Closed-vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

§ 265.1034 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) When a closed-vent system is tested for compliance with no detectable emissions, as required in § 265.1033(j), the test shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be.

(i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(5) The background level shall be determined as set forth in Reference Method 21.

(6) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(7) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(c) Performance tests to determine compliance with § 265.1032(a) and with the total organic compound concentration limit of § 265.1033(c) shall comply with the following:

(1) Performance tests to determine total organic compound concentrations and mass flow rates entering and exiting control devices shall be conducted and data reduced in accordance with the following reference methods and calculation procedures:

(i) Method 2 in 40 CFR part 60 for velocity and volumetric flow rate.

(ii) Method 18 in 40 CFR part 60 for organic content.

(iii) Each performance test shall consist of three separate runs; each run conducted for at least 1 hour under the conditions that exist when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. For the purpose of determining total organic compound concentrations and mass flow rates, the average of results of all runs shall apply. The average shall be computed on a time-weighted basis.

(iv) Total organic mass flow rates shall be determined by the following equation:

$$E_h = Q_{sd} \left[\sum_{i=1}^{n} C_i MW_i \right] [0.0416] [10^{-6}]$$

where:

E_h = Total organic mass flow rate, kg/h;

Q_{sd} = Volumetric flow rate of gases entering or exiting control device, as determined by Method 2, dscm/h;

n = Number of organic compounds in the vent gas;

C_i = Organic concentration in ppm, dry basis, of compound i in the vent gas, as determined by Method 18;

MW_i = Molecular weight of organic compound i in the vent gas, kg/kg-mol;

0.0416=Conversion factor for molar volume, kg-mol/m^3 (@ 293 K and 760 mm Hg);
10^{-6}=Conversion from ppm, ppm^{-1}.

(v) The annual total organic emission rate shall be determined by the following equation:

$$E_A = (E_h)(H)$$

where:

E_A=Total organic mass emission rate, kg/y;
E_h=Total organic mass flow rate for the process vent, kg/h;
H=Total annual hours of operations for the affected unit, h.

(vi) Total organic emissions from all affected process vents at the facility shall be determined by summing the hourly total organic mass emission rates (E_h, as determined in paragraph (c)(1)(v) of this section) and by summing the annual total organic mass emission rates (E_A, as determined in paragraph (c)(1)(v) of this section) for all affected process vents at the facility.

(2) The owner or operator shall record such process information as may be necessary to determine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test.

(3) The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as follows:

(i) Sampling ports adequate for the test methods specified in paragraph (c)(1) of this section.

(ii) Safe sampling platform(s).

(iii) Safe access to sampling platform(s).

(iv) Utilities for sampling and testing equipment.

(4) For the purpose of making compliance determinations, the time-weighted average of the results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Regional Administrator's approval, be determined using the average of the results of the two other runs.

(d) To show that a process vent associated with a hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation is not subject to the requirements of this subpart, the owner or operator must make an initial determination that the time-weighted, annual average total organic concentration of the waste managed by the waste management unit is less than 10 ppmw using one of the following two methods:

(1) Direct measurement of the organic concentration of the waste using the following procedures:

(i) The owner or operator must take a minimum of four grab samples of waste for each waste stream managed in the affected unit under process conditions expected to cause the maximum waste organic concentration.

(ii) For waste generated onsite, the grab samples must be collected at a point before the waste is exposed to the atmosphere such as in an enclosed pipe or other closed system that is used to transfer the waste after generation to the first affected distillation fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation. For waste generated offsite, the grab samples must be collected at the inlet to the first waste management unit that receives the waste provided the waste has been transferred to the facility in a closed system such as a tank truck and the waste is not diluted or mixed with other waste.

(iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060 or 8240 of SW-846 (incorporated by reference under § 260.11).

(iv) The arithmetic mean of the results of the analyses of the four samples shall apply for each waste stream managed in the unit in determining the time-weighted, annual average total organic concentration of the waste. The time-weighted average is to be calculated using the annual quantity of each waste stream processed and the mean organic concentration of each waste stream managed in the unit.

(2) Using knowledge of the waste to determine that its total organic concentration is less than 10 ppmw. Documentation of the waste determination is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to generate a waste stream having a total organic content less than 10 ppmw, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) The determination that distillation fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations manage hazardous wastes with time-weighted annual average total organic concentrations less than 10 ppmw shall be made as follows:

(1) By the effective date that the facility becomes subject to the provisions of this subpart or by the date when the waste is first managed in a waste management unit, whichever is later; and

(2) For continuously generated waste, annually; or

(3) Whenever there is a change in the waste being managed or a change in the process that generates or treats the waste.

(f) When an owner or operator and the Regional Administrator do not agree on whether a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation manages a hazardous waste with organic concentrations of at least 10 ppmw based on knowledge of the waste, the procedures in Method 8240 can be used to resolve the dispute.

§ 265.1035 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For facilities that comply with the provisions of § 265.1033(a)(2), an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The schedule must also include a rationale of why the installation cannot be completed at an earlier date. The implementation schedule must be in the facility operating record by the effective date that the facility becomes subject to the provisions of this subpart.

(2) Up-to-date documentation of compliance with the process vent standards in § 265.1032, including:

(i) Information and data identifying all affected process vents, annual throughput and operating hours of each affected unit, estimated emission rates for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility), and the approximate location within the facility of each affected unit (e.g., identify the hazardous waste management units on a facility plot plan); and

(ii) Information and data supporting determinations of vent emissions and emission reductions achieved by add-on control devices based on engineering calculations or source tests. For the purpose of determining compliance, determinations of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates or vent stream organic compounds and concentrations) that represent the conditions that result in maximum organic emissions, such as when the waste management unit is operating at the highest load or capacity level reasonably expected to occur. If the owner or operator takes any action (e.g., managing a waste of different composition or increasing operating hours of affected waste management units) that would result in an increase in total organic emissions from affected process vents at the facility, then a new determination is required.

(3) Where an owner or operator chooses to use test data to determine the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan. The test plan must include:

(i) A description of how it is determined that the planned test is going to be conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. This shall include the estimated or design flow rate and organic content of each vent stream and define the acceptable operating ranges of key process and control device parameters during the test program.

(ii) A detailed engineering description of the closed-vent system and control device including:

(A) Manufacturer's name and model number of control device.

(B) Type of control device.

(C) Dimensions of the control device.

(D) Capacity.

(E) Construction materials.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(4) Documentation of compliance with § 265.1033 shall include the following information:

(i) A list of all information references and sources used in preparing the documentation.

(ii) Records including the dates of each compliance test required by § 265.1033(j).

(iii) If engineering calculations are used, a design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. Documentation provided by the control device manufacturer or vendor that describes the control device design in accordance with paragraphs (b)(4)(iii)(A) through (b)(4)(iii)(G) of this section may be used to comply with this requirement. The design analysis shall address the vent stream characteristics and control device operation parameters as specified below.

(A) For a thermal vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

(B) For a catalytic vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperatures across the catalyst bed inlet and outlet.

(C) For a boiler or process heater, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average flame zone temperatures, combustion zone residence time, and description of method and location where the vent stream is introduced into the combustion zone.

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in § 265.1033(d).

(E) For a condenser, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic compound concentration level, design average temperature of the condenser exhaust vent stream, and design average temperatures of the coolant fluid at the condenser inlet and outlet.

(F) For a carbon adsorption system such as a fixed-bed adsorber that regenerates the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level, number and capacity of carbon beds, type and working capacity of activated carbon used for carbon beds, design total steam flow over the period of each complete carbon bed regeneration cycle, duration of the carbon bed steaming and cooling/drying cycles, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of carbon.

(G) For a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic concentration level, capacity of carbon bed, type and working capacity of activated carbon used for carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule.

(iv) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(v) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 percent or greater unless the total organic concentration limit of § 265.1032(a) is achieved at an efficiency less than 95 weight percent or the total organic emission limits of § 265.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent. A statement provided by the control device manufacturer or vendor certifying that the control equipment meets the design specifications may be used to comply with this requirement.

(vi) If performance tests are used to demonstrate compliance, all test results.

(c) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of this part shall be recorded and kept up-to-date in the facility operating record. The information shall include:

(1) Description and date of each modification that is made to the closed-vent system or control device design.

(2) Identification of operating parameter, description of monitoring device, and diagram of monitoring sensor location or locations used to comply with § 265.1033(f)(1) and (f)(2).

(3) Monitoring, operating and inspection information required by paragraphs (f) through (j) of § 265.1033.

(4) Date, time, and duration of each period that occurs while the control device is operating when any monitored parameter exceeds the value established in the control device design analysis as specified below:

(i) For a thermal vapor incinerator designed to operate with a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C, period when the combustion temperature is below 760 °C.

(ii) For a thermal vapor incinerator designed to operate with an organic emission reduction efficiency of 95 percent or greater, period when the combustion zone temperature is more than 28 °C below the design average combustion zone temperature established as a requirement of paragraph (b)(4)(iii)(A) of this section.

(iii) For a catalytic vapor incinerator, period when:

(A) Temperature of the vent stream at the catalyst bed inlet is more than 28 °C below the average temperature of the inlet vent stream established as a requirement of paragraph (b)(4)(iii)(B) of this section; or

(B) Temperature difference across the catalyst bed is less than 80 percent of the design average temperature difference established as a requirement of paragraph (b)(4)(iii)(B) of this section.

(iv) For a boiler or process heater, period when:

(A) Flame zone temperature is more than 28 °C below the design average flame zone temperature established as a requirement of paragraph (b)(4)(iii)(C) of this section; or

(B) Position changes where the vent stream is introduced to the combustion zone from the location established as a requirement of paragraph (b)(4)(iii)(C) of this section.

(v) For a flare, period when the pilot flame is not ignited.

(vi) For a condenser that complies with § 265.1033(f)(2)(vi)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the condenser are more than 20 percent greater than the design outlet organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(vii) For a condenser that complies with § 265.1033(f)(2)(vi)(B), period when:

(A) Temperature of the exhaust vent stream from the condenser is more than 6 °C above the design average exhaust vent stream temperature established as a requirement of paragraph (b)(4)(iii)(E) of this section; or

(B) Temperature of the coolant fluid exiting the condenser is more than 6 °C above the design average coolant fluid temperature at the condenser outlet established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(viii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with § 265.1033(f)(2)(vii)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the carbon bed are more than 20 percent greater than the design exhaust vent stream organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(ix) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with § 265.1033(f)(2)(vii)(B), period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(5) Explanation for each period recorded under paragraph (3) of the cause for control device operating parameter exceeding the design value and the measures implemented to correct the control device operation.

(6) For carbon adsorption systems operated subject to requirements specified in § 265.1033(g) or § 265.1033(h)(2), date when existing carbon in the control device is replaced with fresh carbon.

(7) For carbon adsorption systems operated subject to requirements specified in § 265.1033(h)(1), a log that records:

(i) Date and time when control device is monitored for carbon breakthrough and the monitoring device reading.

(ii) Date when existing carbon in the control device is replaced with fresh carbon.

(8) Date of each control device startup and shutdown.

(d) Records of the monitoring, operating, and inspection information required by paragraphs (c)(3) through (c)(8) of this section need be kept only 3 years.

(e) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(f) Up-to-date information and data used to determine whether or not a process vent is subject to the requirements in § 265.1032 including supporting documentation as required by § 265.1034(d)(2) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used, shall be recorded in a log that is kept in the facility operating record.

(Approved by the Office of Management and Budget under control number 2060–0195)

§§ 265.1036–265.1049 [Reserved]

18. 40 CFR part 265 is amended by adding subpart BB to read as follows:

Subpart BB—Air Emission Standards for Equipment Leaks

Subpart BB—Air Emission Standards for Equipment Leaks

§ 265.1050 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 265.1).

(b) Except as provided in § 265.1064(j), this subpart applies to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight that are managed in:

(1) Units that are subject to the permitting requirements of part 270, or

(2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

(c) Each piece of equipment to which this subpart applies shall be marked in such a manner that it can be distinguished readily from other pieces of equipment.

(d) Equipment that is in vacuum service is excluded from the requirements of § 265.1052 to § 265.1060 if it is identified as required in § 265.1064(g)(5).

[Note: The requirements of §§ 265.1052 through 265.1064 apply to equipment associated with hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under §§ 261.4, 262.34, and 265.1(c) are not affected by these requirements.]

§ 265.1051 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260–266.

§ 265.1052 Standards: Pumps in light liquid service.

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in § 265.1063(b), except as provided in paragraphs (d), (e), and (f) of this section.

(2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.

(b)(1) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(2) If there are indications of liquids dripping from the pump seal, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a), *provided* the following requirements are met:

(1) Each dual mechanical seal system must be:

(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or

(ii) Equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device that complies with the requirements of § 265.1060, or

(iii) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to the atmosphere.

(2) The barrier fluid system must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(3) Each barrier fluid system must be equipped with a sensor that will detect failure of the seal system, the barrier fluid system or both.

(4) Each pump must be checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(5)(i) Each sensor as described in paragraph (d)(3) of this section must be checked daily or be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly.

(ii) The owner or operator must determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(6)(i) If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in paragraph (d)(5)(ii) of this section, a leak is detected.

(ii) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(iii) A first attempt at repair (e.g., relapping the seal) shall be made no later than 5 calendar days after each leak is detected.

(e) Any pump that is designated, as described in § 265.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump meets the following requirements:

(1) Must have no externally actuated shaft penetrating the pump housing.

(2) Must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in § 265.1063(c).

(3) Must be tested for compliance with paragraph (a)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(f) If any pump is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of § 265.1060, it is exempt from the requirements of paragraphs (a) through (e) of this section.

§ 265.1053 Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of total organic emissions to the atmosphere, except as provided in paragraphs (h) and (i) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is at all times greater than the compressor stuffing box pressure, or

(2) Equipped with a barrier fluid system that is connected by a closed-vent system to a control device that complies with the requirements of § 265.1060, or

(3) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to atmosphere.

(c) The barrier fluid must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(d) Each barrier fluid system as described in paragraphs (a) through (c) of this section shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly unless the compressor is located within the boundary of an unmanned plant site, in which case the sensor must be checked daily.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates

failure of the seal system, the barrier fluid system or both.

(f) If the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of § 265.1060, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in § 265.1064(g)(2), for no detectable emission as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is determined to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

§ 265.1054 Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in § 265.1059.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(c) Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in § 265.1060 is exempt from the requirements of paragraphs (a) and (b) of this section.

§ 265.1055 Standards: Sampling connecting systems.

(a) Each sampling connection system shall be equipped with a closed-purge system or closed-vent system.

(b) Each closed-purge system or closed-vent system as required in paragraph (a) shall:

(1) Return the purged hazardous waste stream directly to the hazardous waste management process line with no detectable emissions to atmosphere, or

(2) Collect and recycle the purged hazardous waste stream with no detectable emissions to atmosphere, or

(3) Be designed and operated to capture and transport all the purged hazardous waste stream to a control device that complies with the requirements of § 265.1060.

(c) *In situ* sampling systems are exempt from the requirements of paragraphs (a) and (b) of this section.

§ 265.1056 Standards: Open-ended valves or lines.

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve.

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring hazardous waste stream flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the hazardous waste stream end is closed before the second valve is closed.

(c) When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) of this section at all other times.

§ 265.1057 Standards: Valves in gas/vapor service or in light liquid service.

(a) Each valve in gas/vapor or light liquid service shall be monitored monthly to detect leaks by the methods specified in § 265.1063(b) and shall comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section' and §§ 265.1061 and 265.1062.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) Any valve for which a leak is not detected for two successive months may be monitored the first month of every succeeding quarter, beginning with the next quarter, until a leak is detected.

(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in § 265.1059.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

(1) Tightening of bonnet bolts.

(2) Replacement of bonnet bolts.

(3) Tightening of packing gland nuts.

(4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in § 265.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

(1) Has no external actuating mechanism in contact with the hazardous waste stream.

(2) Is operated with emissions less than 500 ppm above background as determined by the method specified in § 265.1063(c).

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(g) Any valve that is designated, as described in § 265.1064(h)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section.

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in § 265.1064(h)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve cannot be monitored without elevating the

monitoring personnel more than 2 meters above a support surface.

(2) The hazardous waste management unit within which the valve is located was in operation before June 21, 1990.

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

§ 265.1058 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors.

(a) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in § 265.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under § 265.1057(e).

§ 265.1059 Standards: Delay of repair.

(a) Delay of repair of equipment for which leaks have been detected will be allowed if the repair is technically infeasible without a hazardous waste management unit shutdown. In such a case, repair of this equipment shall occur before the end of the next hazardous waste management unit shutdown.

(b) Delay of repair of equipment for which leaks have been detected will be allowed for equipment that is isolated from the hazardous waste management unit and that does not continue to contain or contact hazardous waste with organic concentrations at least 10 percent by weight.

(c) Delay of repair for valves will be allowed if:

(1) The owner or operator determines that emissions of purged material resulting from immediate repair are greater than the emissions likely to result from delay of repair.

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with § 265.1060.

(d) Delay of repair for pumps will be allowed if:

(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system.

(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.

(e) Delay of repair beyond a hazardous waste management unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the hazardous waste management unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next hazardous waste management unit shutdown will not be allowed unless the next hazardous waste management unit shutdown occurs sooner than 6 months after the first hazardous waste management unit shutdown.

§ 265.1060 Standards: Closed-vent systems and control devices.

Owners or operators of closed-vent systems and control devices shall comply with the provisions of § 265.1033.

§ 265.1061 Alternative standards for valves in gas/vapor service or in light liquid service: percentage of valves allowed to leak.

(a) An owner or operator subject to the requirements of § 265.1057 may elect to have all valves within a hazardous waste management unit comply with an alternative standard which allows no greater than 2 percent of the valves to leak.

(b) The following requirements shall be met if an owner or operator decides to comply with the alternative standard of allowing 2 percent of valves to leak:

(1) An owner or operator must notify the Regional Administrator that the owner or operator has elected to comply with the requirements of this section.

(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Regional Administrator.

(3) If a valve leak is detected, it shall be repaired in accordance with § 265.1057 (d) and (e).

(c) Performance tests shall be conducted in the following manner:

(1) All valves subject to the requirements in § 265.1057 within the hazardous waste management unit shall be monitored within 1 week by the methods specified in § 265.1063(b).

(2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(3) The leak percentage shall be determined by dividing the number of valves subject to the requirements in § 265.1057 for which leaks are detected by the total number of valves subject to the requirements in § 265.1057 within the hazardous waste management unit.

(d) If an owner or operator decides no longer to comply with this section, the owner or operator must notify the Regional Administrator in writing that the work practice standard described in § 265.1057 (a) through (e) will be followed.

§ 265.1062 Alternative standards for valves in gas/vapor service or in light liquid service: skip period leak detection and repair.

(a)(1) An owner or operator subject to the requirements of § 265.1057 may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of this section.

(2) An owner or operator must notify the Regional Administrator before implementing one of the alternative work practices.

(b)(1) An owner or operator shall comply with the requirements for valves, as described in § 265.1057, except as described in paragraphs (b)(2) and (b)(3) of this section.

(2) After two consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves subject to the requirements in § 265.1057.

(3) After five consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves subject to the requirements in § 265.1057.

(4) If the percentage of valves leaking is greater than 2 percent, the owner or operators hall monitor monthly in compliance with the requirements in § 265.1057, but may again elect to use this section after meeting the requirements of § 265.1057(c)(1).

§ 265.1063 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) Leak detection monitoring, as required in §§ 265.1052–265.1062, shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR Part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be:

(i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10.000 ppm methane or n-hexane.

(5) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(c) When equipment is tested for compliance with no detectable emissions, as required in §§ 265.1052(e), 265.1053(i), 265.1054, and 265.1057(f), the test shall comply with the following requirements:

(1) The requirements of paragraphs (b)(1) through (4) of this section shall apply.

(2) The background level shall be determined, as set forth in Reference Method 21.

(3) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(4) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) In accordance with the waste analysis plan required by § 265.13(b), an owner or operator of a facility must determine, for each piece of equipment, whether the equipment contains or contacts a hazardous waste with organic concentration that equals or exceeds 10 percent by weight using the following:

(1) Methods described in ASTM Methods D 2267–88, E 169–87, E 168–88, E 260–85 (incorporated by reference under § 260.11);

(2) Method 9060 or 8240 of SW–846 (incorporated by reference under § 260.11); or

(3) Application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced. Documentation of a waste determination by knowledge is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to have a total organic content less than 10 percent, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) If an owner or operator determines that a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the determination can be revised only after following the procedures in paragraph (d)(1) or (d)(2) of this section.

(f) When an owner or operator and the Regional Administrator do not agree on whether a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight; the procedures in paragraph (d)(1) or (d)(2) of this section can be used to resolve the dispute.

(g) Samples used in determining the percent organic content shall be representative of the highest total organic content hazardous waste that is expected to be contained in or contact the equipment.

(h) To determine if pumps or valves are in light liquid service, the vapor pressures of constituents may be obtained from standard reference texts or may be determined by ASTM D–2879–86 (incorporated by reference under § 260.11).

(i) Performance tests to determine if a control device achieves 95 weight percent organic emission reduction shall comply with the procedures of § 265.1034 (c)(1) through (c)(4).

§ 265.1064 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For each piece of equipment to which subpart BB of part 265 applies:

(i) Equipment identification number and hazardous waste management unit identification.

(ii) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

(iii) Type of equipment (e.g., a pump or pipeline valve).

(iv) Percent-by-weight total organics in the hazardous waste stream at the equipment.

(v) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(vi) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(2) For facilities that comply with the provisions of § 265.1033(a)(2), an implementation schedule as specified in § 265.1033(a)(2).

(3) Where an owner or operator chooses to use test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan as specified in § 265.1035(b)(3).

(4) Documentation of compliance with § 265.1060, including the detailed design documentation or performance test results specified in § 265.1035(b)(4).

(c) When each leak is detected as specified in §§ 265.1052, 265.1953, 265.1057, and 265.1058, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, the date evidence of a potential leak was found in accordance with § 265.1058(a), and the date the leak was detected, shall be attached to the leaking equipment.

(2) The identification on equipment, except on a valve, may be removed after it has been repaired.

(3) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in § 265.1057(c) and no leak has been detected during those 2 months.

(d) When each leak is detected as specified in §§ 265.1052, 265.1053, 265.1057, and 265.1058, the following information shall be recorded in an inspection log and shall be kept in the facility operating record:

(1) The instrument and operator identification numbers and the equipment identification number.

(2) The date evidence of a potential leak was found in accordance with § 265.1058(a).

(3) The date the leak was detected and the dates of each attempt to repair the leak.

(4) Repair methods applied in each attempt to repair the leak.

(5) "Above 10,000" if the maximum instrument reading measured by the methods specified in § 265.1063(b) after

each repair attempt is equal to or greater than 10,000 ppm.

(6) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(7) Documentation supporting the delay of repair of a valve in compliance with § 265.1059(c).

(8) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a hazardous waste management unit shutdown.

(9) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days.

(10) The date of successful repair of the leak.

(e) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of § 265.1060 shall be recorded and kept up-to-date in the facility operating record as specified in § 265.1035(c). Design documentation is specified in § 265.1035 (c)(1) and (c)(2) and monitoring, operating, and inspection information in § 265.1035 (c)(3)–(c)(8).

(f) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(g) The following information pertaining to all equipment subject to the requirements in §§ 265.1052 through 265.1060 shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for equipment (except welded fittings) subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, under the provisions of §§ 265.1052(e), 265.1053(i), and 265.1057(f).

(ii) The designation of this equipment as subject to the requirements of §§ 265.1052(e), 265.1053(i), or 265.1057(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with § 265.1054(a).

(4)(i) The dates of each compliance test required in §§ 265.1052(e), 265.1053(i), 265.1054, and 265.1057(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(h) The following information pertaining to all valves subject to the requirements of § 265.1057 (g) and (h) shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

(2) A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.

(i) The following information shall be recorded in the facility operating record for valves complying with § 265.1062:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(j) The following information shall be recorded in a log that is kept in the facility operating record:

(1) Criteria required in §§ 265.1052(d)(5)(ii) and 265.1053(e)(2) and an explanation of the criteria.

(2) Any changes to these criteria and the reasons for the changes.

(k) The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions as provided in the applicability section of this subpart and other specific subparts:

(1) An analysis determining the design capacity of the hazardous waste management unit.

(2) A statement listing the hazardous waste influent to and effluent from each hazardous waste management unit subject to the requirements in §§ 265.1052 through 265.1060 and an analysis determining whether these hazardous wastes are heavy liquids.

(3) An up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements in §§ 265.1052 through 265.1060. The record shall include supporting documentation as required by § 265.1063(d)(3) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used. If the owner or operator takes any action (e.g., changing the process that produced the waste) that could result in an increase in the total organic content of the waste contained in or contacted by equipment determined not to be subject to the requirements in §§ 265.1052 through 265.1060, then a new determination is required.

(l) Records of the equipment leak information required by paragraph (d) of this section and the operating information required by paragraph (e) of this section need be kept only 3 years.

(m) The owner or operator of any facility that is subject to this subpart and to regulations at 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to determine compliance with this subpart by documentation either pursuant to § 265.1064 of this subpart, or pursuant to those provisions of 40 CFR part 60 or 61, to the extent that the documentation under the regulation at 40 CFR part 60 or part 61 duplicates the documentation required under this subpart. The documentation under the regulation at 40 CFR part 60 or part 61 shall be kept with or made readily available with the facility operating record.

(Approved by the Office of Management and Budget under control number 2060–0195)

§§ 265.1065–265.1079 [Reserved]

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

19. The authority citation for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6921–6927, 6930, 6934, 6935, 6937–6939, and 6974.

Subpart B—Permit Application

20. Section 270.14 is amended by revising the last sentence of paragraph (b)(5) and by revising paragraphs (b)(8) (iv), (v), and by adding paragraph (b)(8)(vi) to read as follows:

§ 270.14 Contents of Part B: General requirements

* * * * *

(b) * * *

(5) * * * Include, where applicable, as part of the inspection schedule, specific requirements in §§ 264.174, 264.193(i), 264.195, 264.226, 264.254, 264.273, 264.303, 264.602, 264.1033, 264.1052, 264.1053, and 264.1058.

* * * * *

(8) * * *

(iv) Mitigate effects of equipment failure and power outages;

(v) Prevent undue exposure of personnel to hazardous waste (for example, protective clothing); and

(vi) Prevent releases to atmosphere.

* * * * *

Section 270.24 is added to read as follows:

§ 270.24 Specific Part B information requirements for process vents.

Except as otherwise provided in § 264.1, owners and operators of facilities that have process vents to which subpart AA of part 264 applies must provide the following additional information:

(a) For facilities that cannot install a closed-vent system and control device to comply with the provisions of 40 CFR 264 subpart AA on the effective date that the facility becomes subject to the provisions of 40 CFR 264 or 265 subpart AA, an implementation schedule as specified in § 264.1033(a)(2).

(b) Documentation of compliance with the process vent standards in § 264.1032, including:

(1) Information and data identifying all affected process vents, annual throughput and operating hours of each affected unit, estimated emission rates for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility), and the approximate location within the facility of each affected unit (e.g., identify the hazardous waste management units on a facility plot plan).

(2) Information and data supporting estimates of vent emissions and emission reduction achieved by add-on control devices based on engineering calculations or source tests. For the purpose of determining compliance, estimates of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates, or concentrations) that represent the conditions that exist when the waste management unit is operating at the highest load or capacity level reasonably expected to occur.

(3) Information and data used to determine whether or not a process vent is subject to the requirements of § 264.1032.

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with the requirements of § 264.1032, and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(d) Documentation of compliance with § 264.1033, including:

(1) A list of all information references and sources used in preparing the documentation.

(2) Records including the dates of each compliance test required by § 264.103(k).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in § 264.1035(b)(4)(iii).

(4) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater unless the total organic emission limits of § 264.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent.

(Approved by the Office of Management and Budget under control number 2060–0195)

22. Section 270.25 is added as follows:

§ 270.25 Specific part B information requirements for equipment.

Except as otherwise provided in § 264.1, owners and operators of facilities that have equipment to which subpart BB of part 264 applies must provide the following additional information:

(a) For each piece of equipment to which subpart BB of part 264 applies:

(1) Equipment identification number and hazardous waste management unit identification.

(2) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

(3) Type of equipment (e.g., a pump or pipeline valve).

(4) Percent by weight total organics in the hazardous waste stream at the equipment.

(5) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(6) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(b) For facilities that cannot install a closed-vent system and control device to comply with the provisions of 40 CFR 264 subpart BB on the effective date that the facility becomes subject to the provisions of 40 CFR 264 or 265 subpart BB, an implementation schedule as specified in § 264.1033(a)(2).

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(d) Documentation that demonstrates compliance with the equipment standards in §§ 264.1052 to 264.1059. This documentation shall contain the records required under § 264.1064. The Regional Administrator may request further documentation before deciding if compliance has been demonstrated.

(e) Documentation to demonstrate compliance with § 264.1060 shall include the following information:

(1) A list of all information references and sources used in preparing the documentation.

(2) Records including the dates of each compliance test required by § 264.1033(j).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "ATPI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in § 264.1035(b)(4)(iii).

(4) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur.

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater.

(Approved by the Office of Management and Budget under control number 2060-0915)

PART 271—REQUIREMENTS FOR AUTHORIZATION OF STATE HAZARDOUS WASTE PROGRAMS

23. The authority citation for part 271 continues to read as follows:

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

Subpart A—Requirements for Final Authorization

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

§ 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].	Process Vent and Equipment Leak Organic Air Emission Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities.	[Insert FR reference on date of publication].	[Insert effective date.]

[FR Doc. 90-14260 Filed 6-20-90; 8:45 am]

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