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# Colorado Hazardous Waste Regulations

## Part 264

### Standards for Owners and Operators of Permitted Hazardous Waste Treatment, Storage, and Disposal Facilities

Part B – Sections 264.170 – 264.1065  
and 264.1100-1102

(Amended 05/29/13, Effective 07/15/13)

To obtain more information regarding the  
Colorado Hazardous Waste Regulations,  
Please contact the Hazardous Materials and  
Waste Management Division at 303-692-3300.

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**Subpart I -- Use and Management of Containers**

**§ 264.170 Applicability.\***

The regulations in this subpart apply to owners and operators of all hazardous waste facilities that store containers of hazardous waste, except as § 264.1 provides otherwise.

- \* Under § 261.7 and § 261.33(c), if a hazardous waste is emptied from a container the residue remaining in the container is not considered a hazardous waste if the container is "empty" as defined in § 261.7. In that event management of the container is exempt from the requirements of this subpart.

**§ 264.171 Condition of Containers.**

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or if it begins to leak, the owner or operator must transfer the hazardous waste from this container to a container that is in good condition or manage the waste in some other way that complies with the requirements of this part.

**§ 264.172 Compatibility of waste with containers.**

The owner or operator must use a container made of or lined with materials which will not react with, and are otherwise compatible with, the hazardous waste to be stored, so that the ability of the container to contain the waste is not impaired.

**§ 264.173 Management of containers.**

- (a) A container holding hazardous waste must always be closed during storage, except when it is necessary to add or remove waste.
- (b) A container holding hazardous waste must not be opened, handled, or stored in a manner which may rupture the container or cause it to leak.

**§ 264.174 Inspections.**

At least weekly, the owner or operator must inspect areas where containers are stored. The owner or operator must look for leaking containers and for deterioration of containers and the containment system caused by corrosion or other factors.

[**Comment:** See §§ 264.15(c) and 264.171 for remedial action required if deterioration or leaks are detected.]

**§ 264.175 Containment.**

(a) Container storage areas must have a containment system that is designed and operated in accordance with paragraph (b) of this section, except as otherwise provided by paragraph (c) of this section.

(b) A containment system must be designed and operated as follows:

(1) A base must underly the containers which is free of cracks or gaps and is sufficiently impervious to contain leaks, spills, and accumulated precipitation until the collected material is detected and removed;

(2) The base must be sloped or the containment system must be otherwise designed and operated to drain and remove liquids resulting from leaks, spills, or precipitation, unless the containers are elevated or are otherwise protected from contact with accumulated liquids;

(3) The containment system must have sufficient capacity to contain 10% of the volume of containers or the volume of the largest container, whichever is greater. Containers that do not contain free liquids need not be considered in this determination;

(4) Run-on into the containment system must be prevented unless the collection system has sufficient excess capacity in addition to that required in paragraph (b)(3) of this section to contain any run-on which might enter the system; and

(5) Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

(c) Storage areas that store containers holding only wastes that do not contain free liquids need not have a containment system defined by paragraph (b) of this section, except as provided by paragraph (d) of this section or provided that:

(1) The storage area is sloped or is otherwise designed and operated to drain and remove liquid resulting from precipitation, or

(2) The containers are elevated or are otherwise protected from contact with accumulated liquid.

(d) Storage areas that store containers holding the wastes listed below that do not contain free liquids must have a containment system defined by paragraph (b) of this section:

(1) F020, F021, F022, F023, F026, and F027.

(2) (Reserved)

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**§ 264.176 Special requirements for ignitable or reactive waste.**

Containers holding ignitable or reactive waste must be located at least 15 meters (50 feet) inside the facility's property line.

**§ 264.177 Special requirements for incompatible wastes.\***

(a) Incompatible wastes, or incompatible wastes and materials (see Appendix V for examples), must not be placed in the same container, unless § 264.17(b) is complied with.

(b) Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material.

(c) A storage container holding a hazardous waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other materials or protected from them by means of a dike, berm, wall, or other device.

**§ 264.178 Closure.**

At closure, all hazardous waste and hazardous waste residues must be removed from the containment system. Remaining containers, liners, bases, and soil containing or contaminated with hazardous waste or hazardous waste residues must be decontaminated or removed.

\* As required by § 264.13, the waste analysis plan must include analyses needed to comply with § 264.177. Also, § 264.17(c) requires wastes analyses, trial tests or other documentation to assure compliance with § 264.17(b). As required by § 264.73, the owner or operator must place the results of each waste analysis and trial test, and any documented information, in the operating record of the facility.

**§ 264.179 Air Emission Standards.**

The owner or operator shall manage all hazardous waste placed in a container in accordance with the applicable requirements of Subparts AA, BB, and CC of this part.

**Subpart J -- Tanks**

**§ 264.190 Applicability.**

The requirements of this subpart apply to owners and operators of facilities that use tank systems for storing or treating hazardous waste except as otherwise provided in paragraphs (a), (b), (c) and (d) of this section or in § 264.1 of this part.

(a) Tank systems that are used to store or treat hazardous waste which contains no free liquids and are situated inside a building with an impermeable floor are exempted from the requirements in § 264.193. To demonstrate the absence or presence of free liquids in the stored/treated waste, the following test method must be used: Method 9095B (Paint Filter Liquids Test) as described in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW 846, as incorporated by reference in § 260.11 of these regulations.

(b) Tank systems, including sumps, as defined in § 260.10, that serve as part of a secondary containment system to collect or contain releases of hazardous wastes are exempted from the requirements in § 264.193(a).

(c) Sumps which have sufficiently low storage capacities and short accumulation times such that they mainly function as flow control devices, and which otherwise fit the definition of "ancillary equipment", are subject to the requirements for ancillary equipment rather than the requirements for tanks.

(d) Tanks, sumps, and other such collection devices or systems used in conjunction with drip pads, as defined in § 260.10 of these regulations and regulated under Subpart W, must meet the requirements of this subpart.

**§ 264.191 Assessment of existing tank system's integrity.**

(a) For each existing tank system that does not have secondary containment meeting the requirements of § 264.193, the owner or operator must determine that the tank system is not leaking or is unfit for use. Except as provided in paragraph (c) of this section, the owner or operator must obtain and keep on file at the facility a written assessment reviewed and certified by an independent, qualified registered professional engineer, in accordance with § 100.12(d), that attests to the tank system's integrity within one year of the effective date of these regulations. The effective date of these regulations for new underground tanks, for underground tanks that cannot be entered for inspections, and for tanks operated by small quantity generators is July 14, 1986.

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(b) This assessment must determine that the tank system is adequately designed and has sufficient structural strength and compatibility with the waste(s) to be stored or treated, to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment must consider the following:

- (1) Design standard(s), if available, according to which the tank and ancillary equipment were constructed;
- (2) Hazardous characteristics of the waste(s) that have been and will be handled;
- (3) Existing corrosion protection measures;
- (4) Documented age of the tank system, if available (otherwise, an estimate of the age); and
- (5) Results of a leak test, internal inspection, or other tank integrity examination such that:
  - (i) For non-enterable underground tanks, the assessment must include a leak test that is capable of taking into account the effects of temperature variations, tank end deflection, vapor pockets, and high water table effects, and
  - (ii) For other than non-enterable underground tanks and for ancillary equipment, this assessment must include either a leak test, as described above, or other integrity examination, that is certified by an independent, qualified, registered professional engineer, in accordance with § 100.12(d), that addresses cracks, leaks, corrosion, and erosion.

[NOTE - The practices described in the American Petroleum Institute (API) Publication, Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks", 4th edition, 1981, may be used, where applicable, as guidelines in conducting other than a leak test.]

(c) Tank systems that store or treat materials that become hazardous wastes subsequent to the effective date of these regulations, must conduct this assessment within 12 months after the date that the waste becomes a hazardous waste. The effective date of these regulations for new underground tanks, for underground tanks that cannot be entered for inspection, and for tanks operated by small quantity generators is July 14, 1986.

(d) If, as result of the assessment conducted in accordance with paragraph (a), a tank system is found to be leaking or unfit for use, the owner or operator must comply with the requirements of § 264.196.

**§ 264.192 Design and installation of new tank system or components.**

(a) Owners or operators of new tank systems or components must obtain and submit to the Department, at time of submittal of Part B information, a written assessment, reviewed and certified by an independent, qualified registered professional engineer, in accordance with § 100.12(d), attesting that the tank system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. The assessment must show that the foundation, structural support, seams, connections, and pressure controls (if applicable) are adequately designed and that the tank system has sufficient structural strength, compatibility with the waste(s) to be stored or treated, and corrosion protection to ensure that it will not collapse, rupture, or fail. This assessment, which will be used by the Department to review and approve or disapprove the acceptability of the tank system design, must include, at a minimum, the following information:

- (1) Design standard(s) according to which tank(s) and/or the ancillary equipment are constructed;
- (2) Hazardous characteristics of the waste(s) to be handled;
- (3) For new tank systems or components in which the external shell of a metal tank or any external metal component of the tank system will be in contact with the soil or with water, a determination by a corrosion expert of:
  - (i) Factors affecting the potential for corrosion, including but not limited to:
    - (A) Soil moisture content;
    - (B) Soil pH;
    - (C) Soil sulfides level;
    - (D) Soil resistivity;
    - (E) Structure to soil potential;
    - (F) Influence of nearby underground metal structures (e.g., piping);
    - (G) Existence of stray electric current;
    - (H) Existing corrosion - protection measures (e.g., coating, cathodic protection), and

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(ii) The type and degree of external corrosion protection that are needed to ensure the integrity of the tank system during the use of the tank system or component, consisting of one or more of the following:

(A) Corrosion-resistant materials of construction such as special alloys, fiberglass reinforced plastic, etc.;

(B) Corrosion-resistant coating (such as epoxy, fiberglass, etc.) with cathodic protection (e.g., impressed current or sacrificial anodes); and

(C) Electrical isolation devices such as insulating joints, flanges, etc.

[NOTE - The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) - Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems", and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems", may be used, where applicable, as guidelines in providing corrosion protection for tank systems.]

(4) For underground tank system components that are likely to be adversely affected by vehicular traffic a determination of design or operational measures that will protect the tank system against potential damage; and

(5) Design considerations to ensure that:

(i) Tank foundations will maintain the load of a full tank;

(ii) Tank systems will be anchored to prevent flotation or dislodgement where the tank system is placed in a saturated zone, or is located within a seismic fault zone subject to the standards of § 264.18(a); and

(iii) Tank systems will withstand the effects of frost heave.

(b) The owner or operator of a new tank system must ensure that proper handling procedures are adhered to in order to prevent damage to the system during installation. Prior to covering, enclosing, or placing a new tank system or component in use, an independent qualified installation inspector or an independent, qualified, registered professional engineer, either of whom is trained and experienced in the proper installation of tank systems or components, must inspect the system for the presence of any of the following items:

(1) Weld breaks;

(2) Punctures;

(3) Scrapes of protective coatings;

(4) Cracks;

(5) Corrosion;

(6) Other structural damage or inadequate construction/installation. All discrepancies must be remedied before the tank system is covered, enclosed, or placed in use.

(c) New tank systems or components that are placed underground and that are backfilled must be provided with a backfill material that is a noncorrosive, porous, homogeneous substance and that is installed so that the backfill is placed completely around the tank and compacted to ensure that the tank and piping are fully and uniformly supported.

(d) All new tanks and ancillary equipment must be tested for tightness prior to being covered, enclosed, or placed in use. If a tank system is found not to be tight, all repairs necessary to remedy the leak(s) in the system must be performed prior to the tank system being covered, enclosed, or placed into use.

(e) Ancillary equipment must be supported and protected against physical damage and excessive stress due to settlement, vibration, expansion, or contraction.

[NOTE - The piping system installation procedures described in American Petroleum Institute (API) Publication 1615 (November 1979), "Installation of Underground Petroleum Storage Systems", or ANSI Standard B31.3, "Petroleum Refinery Piping", and ANSI Standard B31.4 "Liquid Petroleum Transportation Piping System", may be used, where applicable, as guidelines for proper installation of piping systems.]

(f) The owner or operator must provide the type and degree of corrosion protection recommended by an independent corrosion expert, based on the information provided under paragraph (a)(3) of this section, or other corrosion protection if the Department believes other corrosion protection is necessary to ensure the integrity of the tank system during use of the tank system. The installation of a corrosion protection system that is field fabricated must be supervised by an independent corrosion expert to ensure proper installation.

(g) The owner or operator must obtain and keep on file at the facility written statements by those persons required to certify the design of the tank system and supervise the installation of the tank system in accordance with the requirements of paragraphs (b) through (f) of this section, that attest that the tank system was properly designed and installed and that repairs, pursuant to paragraphs (b) and (d) of this section, were performed. These written statements must also include the certification statement as required in § 100.12(d).

**§ 264.193 Containment and detection of releases.**

(a) In order to prevent the release of hazardous waste or hazardous constituents to the environment, secondary containment that meets the requirements of this section must be provided (except as provided in paragraphs (f) and (g) of this section):

(1) For all new and existing tank systems or components, prior to their being put into service;

(2) For tank systems that store or treat materials that become hazardous wastes, within two years of the hazardous waste listing, or when the tank system has reached 15 years of age, whichever comes later.

(b) Secondary containment systems must be:

(1) Designed, installed, and operated to prevent any migration of wastes or accumulated liquid out of the system to the soil, ground water, or surface water at any time during the use of the tank system; and

(2) Capable of detecting and collecting releases and accumulated liquids until the collected material is removed.

(c) To meet the requirements of paragraph (b) of this section, secondary containment systems must be at a minimum:

(1) Constructed of or lined with materials that are compatible with the waste(s) to be placed in the tank system and must have sufficient strength and thickness to prevent failure owing to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which it is exposed, climatic conditions, and the stress of daily operation (including stresses from nearby vehicular traffic).

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- (2) Placed on a foundation or base capable of providing support to the secondary containment system, resistance to pressure gradients above and below the system, and capable of preventing failure due to settlement, compression, or uplift;
- (3) Provided with a leak-detection system that is designed and operated so that it will detect the failure of either the primary or secondary containment structure or the presence of any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the owner or operator can demonstrate to the Department that existing detection technologies or site conditions will not allow detection of a release within 24 hours; and
- (4) Sloped or otherwise designed or operated to drain and remove liquids resulting from leaks, spills, or precipitation. Spilled or leaked waste and accumulated precipitation must be removed from the secondary containment system within 24 hours, or in as timely a manner as is possible to prevent harm to human health and the environment, if the owner or operator can demonstrate to the Department that removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

[NOTE: - If the collected material including precipitation is a hazardous waste under Part 261 of these regulations, it is subject to management as a hazardous waste in accordance with all applicable requirements of Parts 262 through 265 of these regulations. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of Sections 301, 304, and 402 of the Clean Water Act, as amended. If discharged to a Publicly Owned Treatment Works (POTW), it is subject to the requirements of Section 307 of the Clean Water Act, as amended. If the collected material is released to the environment, it may be subject to the reporting requirements of 40 CFR Part 302).

(d) Secondary containment for tanks must include one or more of the following devices:

- (1) A liner (external to the tank);
- (2) A vault;
- (3) A double-walled tank; or
- (4) An equivalent device as approved by the Department

(e) In addition to the requirements of paragraphs (b), (c), and (d) of this section, secondary containment systems must satisfy the following requirements:

- (1) External liner systems must be:
  - (i) Designed or operated to contain 100 percent of the capacity of the largest tank within its boundary;

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(ii) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25-year, 24-hour rainfall event.

(iii) Free of cracks or gaps; and

(iv) Designed and installed to surround the tank completely and to cover all surrounding earth likely to come into contact with the waste if the waste is released from the tank(s) (i.e. capable of preventing lateral as well as vertical migration of the waste).

(2) Vault systems must be:

(i) Designed or operated to contain 100 percent of the capacity of the largest tank within its boundary;

(ii) Designed or operated to prevent run-on or infiltration of precipitation into the secondary containment system unless the collection system has sufficient excess capacity to contain run-on or infiltration. Such additional capacity must be sufficient to contain precipitation from a 25-year, 24 hour rainfall event;

(iii) Constructed with chemical-resistant water stops in place in all joints (if any);

(iv) Provided with an impermeable interior coating or lining that is compatible with the stored waste and that will prevent migration of waste into the concrete;

(v) Provided with a means to protect against the formation of and ignition of vapors within the vault, if the waste being stored or treated:

(A) Meets the definition of ignitable waste under § 261.21 of these regulations; or

(B) Meets the definition of reactive waste under § 261.23 of these regulations, and may form an ignitable or explosive vapor;

(vi) Provided with an exterior moisture barrier or be otherwise designed or operated to prevent migration of moisture into the vault if the vault is subject to hydraulic pressure.

(3) Double-walled tanks must be:

(i) Designed as an integral structure (i.e., an inner tank completely enveloped within an outer shell) so that any release from the inner tank is contained by the outer shell.

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(ii) Protected, if constructed of metal, from both corrosion of the primary tank interior and the external surface of the outer shell; and

(iii) Provided with a built-in continuous leak detection system capable of detecting a release within 24 hours, or at the earliest practicable time, if the owner or operator can demonstrate to the Department, and the Department concludes, that the existing detection technology or site conditions would not allow detection of a release within 24 hours.

[NOTE - The provisions outlined in the Steel Tank Institutes (STI) "Standard for Dual Wall Underground Steel Storage Tanks" may be used as guidelines for aspects of the design of underground steel double-walled tanks.]

(f) Ancillary equipment must be provided with secondary containment (e.g., trench, jacketing, double-walled piping) that meets the requirements of paragraphs (b) and (c) of this section except for:

(1) Aboveground piping (exclusive of flanges, joints, valves, and other connections) that are visually inspected for leaks on a daily basis;

(2) Welded flanges, welded joints, and welded connections, that are visually inspected for leaks on a daily basis;

(3) Sealless or magnetic coupling pumps and sealless valves, that are visually inspected for leaks on a daily basis; and

(4) Pressurized aboveground piping systems with automatic shut-off devices (e.g., excess flow check valves, flow metering shutdown devices, loss of pressure actuated shut-off devices) that are visually inspected for leaks on a daily basis.

(g) The owner or operator may obtain a variance from the requirements of this section if the Department finds, as a result of a demonstration by the owner or operator that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous waste or hazardous constituents into the ground water, or surface water at least as effectively as secondary containment during the active life of the tank system or that in the event of a release that does migrate to ground water or surface water, no substantial present or potential hazard will be posed to human health or the environment. New underground tank systems may not, per a demonstration in accordance with paragraph (g)(2) of this section, be exempted from the secondary containment requirements of this section.

(1) In deciding whether to grant a variance based on a demonstration of equivalent protection of ground water and surface water, the Department will consider:

(i) The nature and quantity of the wastes;

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- (ii) The proposed alternate design and operation;
  - (iii) The hydrogeologic setting of the facility, including the thickness of soils present between the tank system and ground water, and
  - (iv) All other factors that would influence the quality and mobility of the hazardous constituents and the potential for them to migrate to ground water or surface water.
- (2) In deciding whether to grant a variance based on a demonstration of no substantial present or potential hazard, the Department will consider:
- (i) The potential adverse effects on ground water, surface water, and land quality taking into account:
    - (A) The physical and chemical characteristics of the waste in the tank system, including its potential for migration.
    - (B) The hydrogeological characteristics of the facility and surrounding land,
    - (C) The potential for health risks caused by human exposure to waste constituents,
    - (D) The potential for damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents, and
    - (E) The persistence and permanence of the potential adverse effects;
  - (ii) The potential adverse effects of a release on ground water quality, taking into account:
    - (A) The quantity and quality of ground water and the direction of ground water flow.
    - (B) The proximity and withdrawal rates of ground water users,
    - (C) The current and future uses of ground water in the area, and
    - (D) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water quality;

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(iii) The potential adverse effects of a release on surface water quality, taking into account:

- (A) The quantity and quality of ground water and the direction of ground water flow,
- (B) The patterns of rainfall in the region,
- (C) The proximity of the tank system to surface waters,
- (D) The current and future uses of surface waters in the area and any water quality standards established for those surface waters, and
- (E) The existing quality of surface water, including other sources of contamination and the cumulative impact on surface water quality; and

(iv) The potential adverse effects of a release on the land surrounding the tank system, taking into account:

- (A) The patterns of rainfall in the region, and
- (B) The current and future uses of the surrounding land.

(3) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of paragraph (g)(1) of this section, at which a release of hazardous waste has occurred from the primary tank system but has not migrated beyond the zone of engineering control (as established in the variance), must:

(i) Comply with the requirements of § 264.196, except paragraph (d), and

(ii) Decontaminate or remove contaminated soil to the extent necessary to:

- (A) Enable the tank system for which the variance was granted to resume operation with the capability for the detection of releases at least equivalent to the capability it had prior to the release; and
- (B) Prevent the migration of hazardous waste or hazardous constituents to ground water or surface water; and

(iii) If contaminated soil cannot be removed or decontaminated in accordance with paragraphs (g)(3)(ii) of this section, comply with the requirement of § 264.197(b).

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(4) The owner or operator of a tank system, for which a variance from secondary containment had been granted in accordance with the requirements of paragraphs (g)(1) of this section, at which a release of hazardous waste has occurred from the primary tank system and has migrated beyond the zone of engineering control (as established in the variance), must:

(i) Comply with the requirements of § 264.196 (a), (b), (c), and (d); and

(ii) Prevent the migration of hazardous waste or hazardous constituents to ground water or surface water, if possible, and decontaminate or remove contaminated soil. If contaminated soil cannot be decontaminated or removed or if ground water has been contaminated, the owner or operator must comply with the requirements of § 264.197(b); and

(iii) If repairing, replacing or reinstalling the tank system, provide secondary containment in accordance with the requirements of paragraphs (a) through (f) of this section or reapply for a variance from secondary containment and meet the requirements for new tank systems in § 264.192 if the tank system is replaced. The owner or operator must comply with these requirements even if contaminated soil can be decontaminated or removed and ground water or surface water has not been contaminated.

(h) The following procedures must be followed in order to request a variance from secondary containment:

(1) The Department must be notified in writing by the owner or operator that he/she intends to conduct and submit a demonstration for a variance from secondary containment as allowed in paragraph (g) according to the following schedule:

(i) For existing tank systems, at least 24 months prior to the date that secondary containment must be provided in accordance with paragraph (a) of this section.

(ii) For new tank systems, at least 30 days prior to entering into a contract for installation.

(2) As part of the notification, the owner or operator must also submit to the Department a description of the steps necessary to conduct the demonstration and a timetable for completing each of the steps. The demonstration must address each of the factors listed in paragraphs (g)(1) or (g)(2) of this section;

(3) The demonstration for a variance must be completed within 180 days after notifying the Department of an intent to conduct the demonstration; and

(4) If a variance is granted under this paragraph, the Department will require the permittee to construct and operate the tank system in the manner that was demonstrated to meet the requirements for the variance.

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(i) All tank systems, until such time as secondary containment that meets the requirements of this section is provided, must comply with the following:

(1) For non-enterable underground tanks, a leak test that meets the requirements of § 264.191(b)(5) or other tank integrity method, as approved or required by the Department, must be conducted at least annually.

(2) For other than non-enterable underground tanks, the owner or operator must either conduct a leak test as in paragraph (i)(1) of this section or develop a schedule and procedure for an assessment of the overall condition of the tank system by an independent, qualified registered professional engineer. The schedule and procedure must be adequate to detect obvious cracks, leaks, and corrosion or erosion that may lead to cracks and leaks. The owner or operator must remove the stored waste from the tank, if necessary, to allow the condition of all internal tank surfaces to be assessed. The frequency of these assessments must be based on the material of construction of the tank and its ancillary equipment, the age of the system, the type of corrosion or erosion protection used, the rate of corrosion or erosion observed during the previous inspection, and the characteristics of the waste being stored or treated.

(3) For ancillary equipment, a leak test or other integrity assessment as approved by the Department must be conducted at least annually.

[NOTE - The practices described in the American Petroleum Institute (API) Publication Guide for Inspection of Refinery Equipment, Chapter XIII, "Atmospheric and Low-Pressure Storage Tanks", 4th edition, 1981, may be used where applicable, as guidelines for assessing the overall condition of the tank system.]

(4) The owner or operator must maintain on file at the facility a record of the results of the assessments conducted in accordance with paragraphs (i)(1) through (i)(3) of this section.

(5) If a tank system or component is found to be leaking or unfit for use as a result of the leak test or assessment in paragraphs (i)(1) through (i)(3) of this section, the owner or operator must comply with the requirements of § 264.196.

**§ 264.194 General operating requirements.**

(a) Hazardous wastes or treatment reagents must not be placed in a tank system if they could cause the tank, its ancillary equipment, or the containment system to rupture, leak, corrode, or otherwise fail.

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(b) The owner or operator must use appropriate controls and practices to prevent spills and overflows from tank or containment systems. These include at a minimum:

- (1) Spill prevention controls (e.g., check valves, dry disconnect couplings);
- (2) Overfill prevention controls (e.g., level sensing devices, high level alarms, automatic feed cutoff, or bypass to a standby tank); and
- (3) Maintenance of sufficient freeboard in uncovered tanks to prevent overtopping by wave or wind action or by precipitation.

(c) The owner or operator must comply with the requirements of § 264.196 if a leak or spill occurs in the tank system.

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(a) The owner or operator must develop and follow a schedule and procedure for inspecting overfill controls.

(b) The owner or operator must inspect at least once each operating day data gathered from monitoring and leak detection equipment (e.g., pressure or temperature gauges, monitoring wells) to ensure that the tank system is being operated according to its design.

(c) In addition, except as noted under paragraph (d) of this section, the owner or operator must inspect at least once each operating day:

- (1) Above ground portions of the tank system, if any, to detect corrosion or releases of waste.
- (2) The construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system (e.g., dikes) to detect erosion or signs of releases of hazardous waste (e.g., wet spots, dead vegetation).

[**Note:** For purposes of this section, “each operating day” is defined as “every day the tank is in operation (i.e., storing or treating hazardous waste) and not necessarily just on days the facility is open for business.”]

(d) Owners or operators of tank systems that either use leak detection systems to alert facility personnel to leaks, or implement established workplace practices to ensure leaks are promptly identified, must inspect at least weekly those areas described in paragraphs (c)(1) and (c)(2) of this section. Use of the alternate inspection schedule must be documented in the facility’s operating record. This documentation must include a description of the established workplace practices at the facility.

(e) {Reserved}

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(f) Ancillary equipment that is not provided with secondary containment, as described in § 264.193(f)(1) through (4), must be inspected at least once each operating day.

(g) The owner or operator must inspect cathodic protection systems, if present, according to, at a minimum, the following schedule to ensure that they are functioning properly:

(1) The proper operation of the cathodic protection system must be confirmed within six months after initial installation and annually thereafter, and

(2) All sources of impressed current must be inspected and/or tested as appropriate, at least bimonthly (i.e., every other month).

[NOTE - The practices described in the National Association of Corrosion Engineers (NACE) standard, "Recommended Practice (RP-02-85) - Control of External Corrosion on Metallic Buried, or Submerged Liquid Storage Systems", and the American Petroleum Institute (API) Publication 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems", may be used, where applicable, as guidelines in maintaining and inspecting cathodic protection systems.]

(h) The owner or operator must document in the operating record of the facility an inspection of those items in paragraphs (a) through (c) of this section.

**§ 264.196 Response to leaks or spills and disposition of leaking or unfit-for-use tank systems.**

A tank system or secondary containment system from which there has been a leak or spill, or which is unfit for use, must be removed from service immediately, and the owner or operator must satisfy the following requirements:

(a) **Cessation of Use; prevent flow or addition of wastes.** The owner or operator must immediately stop the flow of hazardous waste into the tank system or secondary containment system and inspect the system to determine the cause of the release.

(b) **Removal of waste from tank system or secondary containment system.**

(1) If the release was from the tank system, the owner/operator must, within 24 hours after detection of the leak or, if the owner/operator demonstrates that it is not possible, at the earliest practicable time, remove as much of the waste as is necessary to prevent further release of hazardous waste to the environment and to allow inspection and repair of the tank system to be performed.

(2) If the material released was to a secondary containment system all released materials must be removed within 24 hours or in as timely a manner as is possible to prevent harm to human health and the environment.

(c) **Containment of visible releases to the environment.** The owner/operator must immediately conduct a visual inspection of the release and based upon that inspection:

- (1) Prevent further migration of the leak or spill to soils or surface water; and
- (2) Remove, and properly dispose of, any visible contamination of the soil or surface water.

(d) **Notifications, reports.**

(1) Any release to the environment, except as provided in paragraph (d)(2) of this section, must be reported to the Department within 24 hours of its detection. If the release has been reported pursuant to 40 CFR Part 302, that report will satisfy this requirement.

(2) A leak or spill of hazardous waste is exempted from the requirements of this paragraph if it is:

- (i) Less than or equal to a quantity of one (1) pound, and
- (ii) Immediately contained and cleaned-up.

(3) Within 30 days of detection of a release to the environment, a report containing the following information must be submitted to the Department:

- (i) Likely route of migration of the release;
- (ii) Characteristics of the surrounding soil (soil composition, geology, hydrogeology, climate);
- (iii) Results of any monitoring or sampling conducted in connection with the release (if available). If sampling or monitoring data relating to the release are not available within 30 days, these data must be submitted to the Department as soon as they become available.
- (iv) Proximity to downgradient drinking water, surface water, and populated areas; and
- (v) Description of response actions taken or planned.

(e) **Provision of secondary containment, repair, or closure.**

(1) Unless the owner/operator satisfies the requirements of paragraphs (e)(2) through (4) of this section, the tank system must be closed in accordance with § 264.197.

(2) If the cause of the release was a spill that has not damaged the integrity of the system, the owner/operator may return the system to service as soon as the released waste is removed and repairs, if necessary, are made.

(3) If the cause of the release was a leak from the primary tank system into the secondary containment system, the system must be repaired prior to returning the tank system to service.

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(4) If the source of the release was a leak to the environment from a component of a tank system without secondary containment, the owner/operator must provide the component of the system from which the leak occurred with secondary containment that satisfies the requirements of § 264.193 before it can be returned to service, unless the source of the leak is an aboveground portion of a tank system that can be inspected visually. If the source is an above-ground component that can be inspected visually, the component must be repaired and may be returned to service without secondary containment as long as the requirements of paragraph (f) of this section are satisfied. If a component is replaced to comply with the requirements of this subparagraph, that component must satisfy the requirements for new tank systems or components in §§ 264.192 and 264.193. Additionally, if a leak has occurred in any portion of a tank system component that is not readily accessible for visual inspection (e.g., the bottom of an inground or onground tank), the entire component must be provided with secondary containment in accordance with § 264.193 prior to being returned to use.

(f) **Certification of major repairs.** If the owner/operator has repaired a tank system in accordance with paragraph (e) of this section, and the repair has been extensive (e.g., installation of an internal liner; repair of a ruptured primary containment or secondary containment vessel), the tank system must not be returned to service unless the owner/operator has obtained a certification by an independent, qualified, registered, professional engineer, in accordance with § 100.12(d), that the repaired system is capable of handling hazardous wastes without release for the intended life of the system. This certification must be submitted to the Department within seven days after returning the tank system to use.

[NOTE - The EPA or the Department may, on the basis of any information received that there is or has been a release of hazardous waste or hazardous constituents into the environment, issue an order under RCRA sections 3004 (v), 3008(h), or 7003(a) or issue an order under § 264.101 of these regulations (CCR 25-15-301(4)) requiring corrective action or such other response as deemed necessary to protect human health or the environment.]

[NOTE - See § 264.15(c) for the requirements necessary to remedy a failure. Also, 40 CFR Part 302 may require the owner or operator to notify the National Response Center of certain releases.]

**§ 264.197 Closure and post-closure care.**

(a) At closure of a tank system, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.) contaminated soils, and structures and equipment contaminated with waste, and manage them as hazardous waste, unless § 261.3(d) of these regulations applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank systems must meet all of the requirements specified in Subpart G of this part and Part 266 of these regulations.

(b) If the owner or operator demonstrates that not all contaminated soils can be practicably removed or decontaminated as required in paragraph (a) of this section, then the owner or operator must close the tank system and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (§ 264.310). In addition, for the purposes of closure, post-closure, and financial responsibility, such a tank system is then considered to be a landfill, and the owner or operator must meet all the requirements for landfills specified in Subpart G of this part and Part 266 of these regulations.

(c) If an owner or operator has a tank system that does not have secondary containment that meets the requirements of § 264.193(b) through (f) and has not been granted a variance from the secondary containment requirements in accordance with § 264.193(g), then:

- (1) The closure plan for the tank system must include both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section.
- (2) A contingent post-closure plan for complying with paragraph (b) of this section must be prepared and submitted as part of the permit application.
- (3) The cost estimates calculated for closure and post-closure care must reflect the costs of complying with the contingent closure plan and the contingent post-closure plan, if those costs are greater than the costs of complying with the closure plan prepared for the expected closure under paragraph (a) of this section.
- (4) Financial assurance must be based on the cost estimates in paragraph (c)(3) of this section.
- (5) For the purposes of the contingent closure and post-closure plans, such a tank system is considered to be a landfill, and the contingent plans must meet all of the closure, post-closure, and financial responsibility requirements for landfills under Subpart G of this part and Part 266 of these regulations.

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**§ 264.198 Special requirements for ignitable or reactive wastes.**

(a) Ignitable or reactive waste must not be placed in tank systems, unless:

(1) The waste is treated, rendered, or mixed before or immediately after placement in the tank system so that:

(i) The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under §§ 261.21 or 261.23 of these regulations, and

(ii) Section 264.17(b) is complied with;

(2) The waste is stored or treated in such a way that it is protected from any material or conditions that may cause the waste to ignite or react; or

(3) The tank system is used solely for emergencies.

(b) The owner or operator of a facility where ignitable or reactive waste is stored or treated in a tank must comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjoining property line that can be built upon as required in Tables 2-1 through 2-6 of the National Fire Protection Association's "Flammable and Combustible Liquids Code", (1977 or 1981), (incorporated by reference, see § 260.11).

**§ 264.199 Special requirements for incompatible wastes.**

(a) Incompatible wastes, or incompatible wastes and materials, must not be placed in the same tank system, unless § 264.17(b) is complied with.

(b) Hazardous waste must not be placed in a tank system that has not been decontaminated and that previously held an incompatible waste or material, unless § 264.17(b) is complied with.

**§ 264.200 Air Emission Standards.**

The owner or operator shall manage all hazardous waste placed in a tank in accordance with the applicable requirements of Subparts AA, BB, and CC of this part.

**Subpart K -- Surface Impoundments**

**§ 264.220 Applicability.**

The regulations in this subpart apply to owners and operators of facilities that use surface impoundments to treat, store, or dispose of hazardous waste except as § 264.1 provides otherwise.

**§ 264.221 Design and operating requirements.**

(a) Any surface impoundment that is not covered by paragraph (c) of this section or § 265.221 of these regulations must have a liner for all portions of the impoundment (except for existing portions of such impoundments). The liner must be designed, constructed, and installed to prevent any migration of wastes out of the impoundment to the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the impoundment. The liner may be constructed of materials that may allow wastes to migrate into the liner (but not into the adjacent subsurface soil or ground water or surface water) during the active life of the facility, provided that the impoundment is closed in accordance with § 264.228(a)(1). For impoundments that will be closed in accordance with § 264.228(a)(2), the liner must be constructed of materials that can prevent wastes from migrating into the liner during the active life of the facility. The liner must be:

- (1) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;
- (2) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and
- (3) Installed to cover all surrounding earth likely to be in contact with the waste or leachate.

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(b) The owner or operator will be exempted from the requirements of paragraph (a) of the section if the Department finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see § 264.93) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Department will consider:

- (1) The nature and quantity of the wastes;
- (2) The proposed alternate design and operation;
- (3) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the impoundment and ground water or surface water; and
- (4) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.

(c) The owner or operator of each new surface impoundment on which construction commences after January 29, 1992, each lateral expansion of a surface impoundment unit on which construction commences after July 29, 1992 and each replacement of an existing surface impoundment unit that is to commence reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system between such liners. "Construction commences" is as defined in § 260.10 of these regulations under "existing facility".

(1)(i) The **liner system** must include:

(A) A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and

(B) A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec.

(ii) The liners must comply with paragraphs (a)(1), (2), and (3) of this section.

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- (2) The **leachate collection and removal system** between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a **leak detection system**. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:
- (i) Constructed with a bottom slope of one percent or more;
  - (ii) Constructed of granular drainage materials with a hydraulic conductivity of  $1 \times 10^{-1}$  cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of  $3 \times 10^{-4}$  m<sup>2</sup>/sec or more;
  - (iii) Constructed of materials that are chemically resistant to the waste managed in the surface impoundment and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes and any waste cover materials or equipment used at the surface impoundment;
  - (iv) Designed and operated to minimize clogging during the active life and post-closure care period; and
  - (v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.
- (3) The owner or operator shall collect and remove pumpable liquids in the sumps to minimize the head on the bottom liner.
- (4) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.
- (d) The Department may approve alternative design or operating practices to those specified in paragraph (c) of this section if the owner or operator demonstrates to the Department that such design and operating practices, together with location characteristics:
- (1) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal system specified in paragraph (c) of this section; and

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(2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

(e) The Department is authorized to exempt the owner or operator of a monofill from the requirements of paragraph (c) of this section if the following conditions are met:

(1) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand and such wastes do not contain constituents which would render the wastes hazardous for reasons other than the EP toxicity characteristics in § 261.24; and

(2)(i)(A) The monofill has at least one liner for which there is no evidence that the liner is leaking. For the purposes of this paragraph, the term "liner" means a liner designed, constructed, installed, and operated to prevent hazardous waste from passing into the liner at any time during the active life of the facility, or designed, constructed, installed, and operated to prevent hazardous waste from migrating beyond the liner to adjacent subsurface soil, ground water, or surface water at any time during the active life of the facility. In the case of any surface impoundment which has been exempted from the requirements of paragraph (c) of this section on the basis of a liner designed, constructed, installed, and operated to prevent hazardous waste from passing beyond the liner, at the closure of such impoundment, the owner or operator must remove or decontaminate all waste residues, all contaminated liner material, and contaminated soil to the extent practicable. If all contaminated soil is not removed or decontaminated, the owner or operator of such impoundment will comply with appropriate post-closure requirements, including but not limited to groundwater monitoring and corrective action.

(B) The monofill is located more than one-fourth mile from an underground source of drinking water as defined in 40 CFR § 144.3; and

(C) The monofill is in compliance with generally applicable ground water monitoring requirements for facilities with RCRA permits; or

(ii) The owner or operator demonstrates that the monofill is located, designed, and operated so as to assure that there will be no migration of any hazardous constituent into ground water or surface water at any future time.

(f) The owner or operator of any replacement surface impoundment unit is exempt from paragraph (c) of this section if:

(1) The existing unit was constructed in compliance with the design standards of sections 3004(o)(1)(A)(i) and (o)(5) of the Resource Conservation and Recovery Act [42 U.S.C. § 6924(o)]; and

(2) There is no reason to believe that the liner is not functioning as designed.

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(g) A surface impoundment must be designed, constructed, maintained, and operated to prevent overtopping resulting from normal or abnormal operations; overfilling; wind and wave action; rainfall; run-on; malfunctions of level controllers, alarms, and other equipment; and human error.

(h) A surface impoundment must have dikes that are designed, constructed and maintained with sufficient structural integrity to prevent massive failure of the dikes. In ensuring structural integrity, it must not be presumed that the liner system will function without leakage during the active life of the unit.

(i) The Department will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.

### § 264.222 Action leakage rate.

(a) The Department shall approve an action leakage rate for surface impoundment units subject to § 264.221(c) or (d). The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

(b) To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly or monthly flow rate from the monitoring data obtained under § 264.226(d) to an average daily flow rate (gallons per acre per day) for each sump. Unless the Department approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period, and if the unit is closed in accordance with § 264.228(b), monthly during the post-closure care period when monthly monitoring is required under § 264.226(d).

### § 264.223 Response actions.

(a) The owner or operator of surface impoundment units subject to § 264.221 (c) or (d) must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in paragraph (b) of this section.

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(b) If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:

- (1) Notify the Department in writing of the exceedence within 7 days of the determination;
- (2) Submit a preliminary written assessment to the Department within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
- (3) Determine to the extent practicable the location, size, and cause of any leak;
- (4) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
- (5) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and
- (6) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Department the results of the analyses specified in paragraphs (b)(3), (4), and (5) of this section, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Department a report summarizing the results of any remedial actions taken and actions planned.

(c) To make the leak and/or remediation determinations in paragraphs (b)(3), (4), and (5) of this section, the owner or operator must:

- (1)(i) Assess the source of liquids and amounts of liquids by source,
  - (ii) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
  - (iii) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
- (2) Document why such assessments are not needed.

§§ 264.224 through 264.225 [Reserved]

**§ 264.226 Monitoring and inspection.**

(a) During construction and installation, liners (except in the case of existing portions of surface impoundments exempt from § 264.221(a)) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:

- (1) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
- (2) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.

(b) While a surface impoundment is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:

- (1) Deterioration, malfunctions, or improper operation of overtopping control systems;
- (2) Sudden drops in the level of the impoundment's contents; and
- (3) Severe erosion or other signs of deterioration in dikes or other containment devices.

(c) Prior to the issuance of a permit, and after any extended period of time (at least six months) during which the impoundment was not in service, the owner or operator must obtain a certification from a qualified engineer that the impoundment's dike, including that portion of any dike which provides freeboard, has structural integrity. The certification must establish, in particular, that the dike:

- (1) Will withstand the stress of the pressure exerted by the types and amounts of wastes to be placed in the impoundment; and
- (2) Will not fail due to scouring or piping, without dependence on any liner system included in the surface impoundment construction.

(d)(1) An owner or operator required to have a leak detection system under § 264.221(c) or (d) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

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(2) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

(3) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the Department based on pump activation level, sump dimensions, and level that avoids backup into the drainage layer and minimizes head in the sump.

**§ 264.227 Emergency repairs; contingency plans.**

(a) A surface impoundment must be removed from service in accordance with paragraph (b) of this section when:

- (1) The level of liquids in the impoundment suddenly drops and the drop is not known to be caused by changes in the flows into or out of the impoundment; or
- (2) The dike leaks.

(b) When a surface impoundment must be removed from service as required by paragraph (a) of this section, the owner or operator must:

- (1) Immediately shut off the flow or stop the addition of wastes into the impoundment;
- (2) Immediately contain any surface leakage which has occurred or is occurring;
- (3) Immediately stop the leak;
- (4) Take any other necessary steps to stop or prevent catastrophic failure;
- (5) If a leak cannot be stopped by any other means, empty the impoundment; and
- (6) Notify the Department of the problem in writing within seven days after detecting the problem.

(c) As part of the contingency plan required in Subpart D of this part, the owner or operator must specify a procedure for complying with the requirements of paragraph (b) of this section.

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(d) No surface impoundment that has been removed from service in accordance with the requirements of this section may be restored to service unless the portion of the impoundment which was failing is repaired and the following steps are taken;

(1) If the impoundment was removed from service as the result of actual or imminent dike failure, the dike's structural integrity must be recertified in accordance with § 264.226(c).

(2) If the impoundment was removed from service as the result of a sudden drop in the liquid level, then;

(i) For any existing portion of the impoundment, a liner must be installed in compliance with § 264.221(a); and

(ii) For any other portion of the impoundment, the repaired liner system must be certified by a qualified engineer as meeting the design specifications approved in the permit.

(e) A surface impoundment that has been removed from service in accordance with the requirements of this section and that is not being repaired must be closed in accordance with the provisions of § 264.228.

**§ 264.228 Closure and post-closure care.**

(a) At closure, the owner or operator must;

(1) Remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless § 261.3(d) of these regulations applies; or

(2)(i) Eliminate free liquids by removing liquid wastes or solidifying the remaining wastes and waste residues;

(ii) Stabilize remaining wastes to a bearing capacity sufficient to support final cover; and

(iii) Cover the surface impoundment with a final cover designed and constructed to;

(A) Provide long-term minimization of the migration of liquids through the closed impoundment;

(B) Function with minimum maintenance;

(C) Promote drainage and minimize erosion or abrasion of the final cover;

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(D) Accommodate settling and subsidence so that the cover's integrity is maintained;  
and

(E) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

(b) If some waste residues or contaminated materials are left in place at final closure, the owner or operator must comply with all post-closure requirements contained in §§ 264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under § 264.117). The owner or operator must:

(1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;

(2) Maintain and monitor the leak detection system in accordance with §§ 264.221(c)(2)(iv) and (3) and 264.226(d), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of Subpart F of this part; and

(4) Prevent run-on and run-off from eroding or otherwise damaging the final cover.

(c)(1) If an owner or operator plans to close a surface impoundment in accordance with paragraph (a)(1) of this section, and the impoundment does not comply with the liner requirements of § 264.221(a) and is not exempt from them in accordance with § 264.221(b), then:

(i) The closure plan for the impoundment under § 264.112 must include both a plan for complying with paragraph (a)(1) of this section and a contingent plan for complying with paragraph (a)(2) of this section in case not all contaminated subsoils can be practicably removed at closure; and

(ii) The owner or operator must prepare a contingent post-closure plan under § 264.118 for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§ 266.12 and 266.13 for closure and post-closure care of an impoundment subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a)(1) of this section.

**§ 264.229 Special requirements for ignitable or reactive waste.**

Ignitable or reactive waste must not be placed in a surface impoundment, unless the waste and impoundment satisfy all requirements of Part 268, and:

- (a) The waste is treated, rendered, or mixed before or immediately after placement in the impoundment so that:
  - (1) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under § 261.21 or § 261.23 of these regulations; and
  - (2) Section 264.17(b) is complied with; or
- (b) The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react; or
- (c) The surface impoundment is used solely for emergencies.

**§ 264.230 Special requirements for incompatible wastes.**

Incompatible wastes, or incompatible wastes and materials, (see Appendix V of this part for examples) must not be placed in the same surface impoundment, unless § 264.17(b) is complied with.

**§ 264.231 Special requirements for hazardous wastes F020, F021, F022, F023, F026, and F027.**

- (a) Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in a surface impoundment unless the owner or operator operates the surface impoundment in accordance with a management plan for these wastes that is approved by the Department pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:
  - (1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;
  - (2) The attenuative properties of underlying and surrounding soils or other materials;
  - (3) The mobilizing properties of other materials co-disposed with these wastes; and
  - (4) The effectiveness of additional treatment, design, or monitoring techniques.

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(b) The Department may determine that additional design, operating, and monitoring requirements are necessary for surface impoundments managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

**§ 264.232 Air Emission Standards.**

The owner or operator shall manage all hazardous waste placed in a surface impoundment in accordance with the applicable requirements of Subparts BB and CC of this part.

**§§ 264.233 through 264.249 [Reserved]**

**Subpart L -- Waste Piles**

**§ 264.250 Applicability.**

(a) The regulations in this subpart apply to owners and operators of facilities that store or treat hazardous waste in piles, except as § 264.1 provides otherwise.

(b) The regulations in this subpart do not apply to owners or operators or waste piles that are closed with wastes left in place. Such waste piles are subject to regulation under Subpart N of this part (Landfills).

(c) The owner or operator of any waste pile that is inside or under a structure that provides protection from precipitation so that neither run-off nor leachate is generated is not subject to regulation under § 264.251 or under Subpart F of this part, provided that:

- (1) Liquids or materials containing free liquids are not placed in the pile;
- (2) The pile is protected from surface water run-on by the structure or in some other manner;
- (3) The pile is designed and operated to control dispersal of the waste by wind, where necessary, by means other than wetting; and
- (4) The pile will not generate leachate through decomposition or other reactions.

**§ 264.251 Design and operating requirements.**

(a) A waste pile (except for an existing portion of a waste pile) must have:

(1) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the pile into the adjacent subsurface soil or ground water or surface water at any time during the active life (including the closure period) of the waste pile. The liner may be constructed of materials that may allow waste to migrate into the liner itself (but not into the adjacent subsurface soil or ground water or surface water) during the active life of the facility. The liner must be:

(i) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

(ii) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(iii) Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and

(2) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the pile. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must be:

(i) Constructed of materials that are:

(A) Chemically resistant to the waste managed in the pile and the leachate expected to be generated; and

(B) Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying wastes, waste cover materials, and by any equipment used at the pile; and

(ii) Designed and operated to function without clogging through the scheduled closure of the waste pile.

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(b) The owner or operator will be exempted from the requirements of paragraph (a) of this section if the Department finds, based on a demonstration by the owner or operator, that alternate design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see § 264.93) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Department will consider:

- (1) The nature and quantity of the wastes;
- (2) The proposed alternate design and operation;
- (3) The hydrogeologic setting of the facility, including attenuative capacity and thickness of the liners and soils present between the pile and ground water or surface water; and
- (4) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.

(c) The owner or operator of each new waste pile unit, each lateral expansion of a waste pile unit, and each replacement of an existing waste pile unit must install two or more liners and a leachate collection and removal system above and between such liners.

(1)(i) The liner system must include:

(A) A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and

(B) A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec.

(ii) The liners must comply with paragraphs (a)(1)(i), (ii), and (iii) of this section.

(2) The **leachate collection and removal system** immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the waste pile during the active life and post-closure care period. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must comply with paragraphs (c)(3)(iii) and (iv) of this section.

(3) The **leachate collection and removal system** between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a **leak detection system**. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of  $1 \times 10^{-2}$  cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of  $3 \times 10^{-5}$  m<sup>2</sup>/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the waste pile and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the waste pile;

(iv) Designed and operated to minimize clogging during the active life and post-closure care period; and

(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

(5) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.

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- (d) The Department may approve alternative design or operating practices to those specified in paragraph (c) of this section if the owner or operator demonstrates to the Department that such design and operating practices, together with location characteristics:
- (1) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems specified in paragraph (c) of this section; and
  - (2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.
- (e) Paragraph (c) of this section does not apply to monofills that are granted a waiver by the Department in accordance with § 264.221(e).
- (f) The owner or operator of any replacement waste pile unit is exempt from paragraph (c) of this section if:
- (1) The existing unit was constructed in compliance with the design standards of section 3004(o)(1)(A)(i) and (o)(5) of the Resource Conservation and Recovery Act [42 U.S.C. § 6924(o)]; and
  - (2) There is no reason to believe that the liner is not functioning as designed.
- (g) The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the pile during peak discharge from at least a 100-year storm.
- (h) The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 100-year storm.
- (i) Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.
- (j) If the pile contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the pile to control wind dispersal.
- (k) The Department will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.

**§ 264.252 Action leakage rate.**

(a) The Department shall approve an action leakage rate for waste pile units subject to § 264.251(c) or (d). The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

(b) To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly flow rate from the monitoring data obtained under § 264.254(c), to an average daily flow rate (gallons per acre per day) for each sump. Unless the Department approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period.

**§ 264.253 Response actions.**

(a) The owner or operator of waste pile units subject to § 264.251(c) or (d) must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in paragraph (b) of this section.

(b) If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:

- (1) Notify the Department in writing of the exceedence within 7 days of the determination;
- (2) Submit a preliminary written assessment to the Department within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;
- (3) Determine to the extent practicable the location, size, and cause of any leak;
- (4) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;
- (5) Determine any other short-term and long-term actions to be taken to mitigate or stop any leaks; and

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(6) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Department the results of the analyses specified in paragraphs (b)(3), (4), and (5) of this section, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Department a report summarizing the results of any remedial actions taken and actions planned.

(c) To make the leak and/or remediation determinations in paragraphs (b)(3), (4), and (5) of this section, the owner or operator must:

- (1)(i) Assess the source of liquids and amounts of liquids by source,
  - (ii) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
  - (iii) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
- (2) Document why such assessments are not needed.

**§ 264.254 Monitoring and inspection.**

(a) During construction or installation, liners (except in the case of existing portions of piles exempt from § 264.251(a)) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:

- (1) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
- (2) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.

(b) While a waste pile is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:

- (1) Deterioration, malfunctions, or improper operation of run-on and run-off control systems;
- (2) Proper functioning of wind dispersal control systems, where present; and
- (3) The presence of leachate in and proper functioning of leachate collection and removal systems, where present.

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(c) An owner or operator required to have a leak detection system under § 264.251(c) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

**§ 264.255 [Reserved]**

**§ 264.256 Special requirements for ignitable or reactive waste.**

Ignitable or reactive waste must not be placed in a waste pile unless the waste and waste pile satisfy all applicable requirements of Part 268, and:

(a) The waste is treated, rendered, or mixed before or immediately after placement in the pile so that:

(1) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under § 261.21 or § 261.23 of these regulations; and

(2) Section 264.17(b) is complied with; or

(b) The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.

**§ 264.257 Special requirements for incompatible wastes.**

(a) Incompatible wastes, or incompatible wastes and materials, (see Appendix V of this part for examples) must not be placed in the same pile, unless § 264.17(b) is complied with.

(b) A pile of hazardous waste that is incompatible with any waste or other material stored nearby in containers, other piles, open tanks, or surface impoundments must be separated from the other materials, or protected from them by means of a dike, berm, wall, or other device.

(c) Hazardous waste must not be piled on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to ensure compliance with § 264.17(b).

**§ 264.258 Closure and post-closure care.**

(a) At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless § 261.3(d) of these regulations applies.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, he/she must close the facility and perform post-closure care in accordance with the closure and post-closure care requirements that apply to landfills (§ 264.310).

(c)(1) The owner or operator of a waste pile that does not comply with the liner requirements of § 264.251(a)(1) and is not exempt from them in accordance with § 264.250(c) or § 264.251(b), must:

(i) Include in the closure plan for the pile under § 264.112 both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure; and

(ii) Prepares a contingent post-closure plan under § 264.118 for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§ 266.12 and 266.13 for closure and post-closure care of a pile subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a) of this section.

**§ 264.259 Special requirements for hazardous wastes F020, F021, F022, F023, F026, and F027.**

(a) Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in waste piles that are not enclosed (as defined in § 264.250(c)) unless the owner or operator operates the waste pile in accordance with a management plan for these wastes that is approved by the Department pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

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- (3) The mobilizing properties of other materials co-disposed with these wastes; and
  - (4) The effectiveness of additional treatment, design, or monitoring techniques.
- (b) The Department may determine that additional design, operating, and monitoring requirements are necessary for piles managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

**§ 264.260 - § 264.269 [Reserved]**

**Subpart M -- Land Treatment**

**§ 264.270 Applicability.**

The regulations in this subpart apply to owners and operators of facilities that treat or dispose of hazardous waste in land treatment units, except as § 264.1 provides otherwise.

**§ 264.271 Treatment program.**

- (a) An owner or operator subject to this subpart must establish a land treatment program that is designed to ensure that hazardous constituents placed in or on the treatment zone are degraded, transformed, or immobilized within the treatment zone. The Department will specify in the facility permit the elements of the treatment program, including:
- (1) The wastes that are capable of being treated at the unit based on a demonstration under § 264.272;
  - (2) Design measures and operating practices necessary to maximize the success of degradation, transformation, and immobilization processes in the treatment zone in accordance with § 264.273(a); and
  - (3) Unsaturated zone monitoring provisions meeting the requirements of § 264.278.
- (b) The Department will specify in the facility permit the hazardous constituents that must be degraded, transformed, or immobilized under this subpart. Hazardous constituents are constituents identified in Appendix VIII of Part 261 of these regulations, that are reasonably expected to be in, or derived from, waste placed in or on the treatment zone.

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(c) The Department will specify the vertical and horizontal dimensions of the treatment zone in the facility permit. The treatment zone is the portion of the unsaturated zone below and including the land surface in which the owner or operator intends to maintain the conditions necessary for effective degradation, transformation, or immobilization of hazardous constituents. The maximum depth of the treatment zone must be:

- (1) No more than 1.5 meters (5 feet) from the initial soil surface; and
- (2) More than 1 meter (3 feet) above the seasonal high water table.

**§ 264.272 Treatment demonstration.**

(a) For each waste that will be applied to the treatment zone, the owner or operator must demonstrate, prior to application of the waste, that hazardous constituents in the waste can be completely degraded, transformed, or immobilized in the treatment zone.

(b) In making this demonstration, the owner or operator may use field tests, laboratory analyses, available data, or, in the case of existing units, operating data. If the owner or operator intends to conduct field tests or laboratory analyses in order to make the demonstration required under paragraph (a) of this section, he/she must obtain a treatment or disposal permit under § 100.22(d). The Department will specify in this permit the testing, analytical design, and operating requirements (including the duration of the tests and analyses, and, in the case of field tests, the horizontal and vertical dimensions of the treatment zone, monitoring procedures, closure and clean-up activities) necessary to meet the requirements in paragraph (c) of this section.

(c) Any field test or laboratory analysis conducted in order to make a demonstration under paragraph (a) of this section must:

- (1) Accurately simulate the characteristics and operating conditions for the proposed land treatment unit including:
  - (i) The characteristics of the waste (including the presence of Appendix VIII of Part 261 of these regulations constituents);
  - (ii) The climate in the area;
  - (iii) The topography of the surrounding area;
  - (iv) The characteristics of the soil in the treatment zone (including depth); and
  - (v) The operating practices to be used at the unit.

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(2) Be likely to show that hazardous constituents in the waste to be tested will be completely degraded, transformed, or immobilized in the treatment zone of the proposed land treatment unit; and

(3) Be conducted in a manner that protects human health and the environment considering:

(i) The characteristics of the waste to be tested;

(ii) The operating and monitoring measures taken during the course of the test;

(iii) The duration of the test;

(iv) The volume of waste used in the test;

(v) In the case of field tests, the potential for migration of hazardous constituents to ground water or surface water.

**§ 264.273 Design and operating requirements.**

The Department will specify in the facility permit how the owner or operator will design, construct, operate, and maintain the land treatment in compliance with this section.

(a) The owner or operator must design, construct, operate, and maintain the unit to maximize the degradation, transformation, and immobilization of hazardous constituents in the treatment zone. The owner or operator must design, construct, operate, and maintain the unit in accord with all design and operating conditions that were used in the treatment demonstration under § 264.272. At a minimum, the Department will specify the following in the facility permit:

(1) The rate and method of waste application to the treatment zone;

(2) Measures to control soil pH;

(3) Measures to enhance microbial or chemical reactions (e.g., fertilization, tilling); and

(4) Measures to control the moisture content of the treatment zone.

(b) The owner or operator must design, construct, operate, and maintain the treatment zone to minimize run-off of hazardous constituents during the active life of the land treatment unit.

(c) The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the treatment zone during peak discharge from at least a 100-year storm.

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- (d) The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 100-year storm.
- (e) Collection and holding facilities (e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain the design capacity of the system.
- (f) If the treatment zone contains particulate matter which may be subject to wind dispersal, the owner or operator must manage the unit to control wind dispersal.
- (g) The owner or operator must inspect the unit weekly and after storms to detect evidence of:
  - (1) Deterioration, malfunctions, or improper operation of run-on and run-off control systems; and
  - (2) Improper functioning of wind dispersal control measures.

**§ 264.274 - § 264.275 [Reserved]**

**§ 264.276 Food-chain crops.**

The Department may allow the growth of food-chain crops in or on the treatment zone only if the owner or operator satisfies the conditions of this section. The Department will specify in the facility permit the specific food-chain crops which may be grown. If, pursuant to this section, the Department determines that any restrictions on cultivation of food-chain crops are necessary, an environmental covenant must be created and recorded.

- (a)(1) The owner or operator must demonstrate that there is no substantial risk to human health caused by the growth of such crops in or on the treatment zone by demonstrating, prior to the planting of such crops, that hazardous constituents other than cadmium;
  - (i) Will not be transferred to the food or feed portions of the crop by plant uptake or direct contact, and will not otherwise be ingested by food-chain animals (e.g., by grazing); or
  - (ii) Will not occur in greater concentrations in or on the food or feed portions of crops grown on the treatment zone than in or on identical portions of the same crops grown on untreated soils under similar conditions in the same region.
- (2) The owner or operator must make the demonstration required under this paragraph prior to the planting of crops at the facility for all constituents identified in Appendix VIII of Part 261 of these regulations that are reasonably expected to be in, or derived from, waste placed in or on the treatment zone.

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(3) In making a demonstration under this paragraph, the owner or operator may use field tests, greenhouse studies, available data, or, in the case of existing units, operating data, and must:

- (i) Base the demonstration on conditions similar to those present in the treatment zone, including soil characteristics (e.g., pH, cation exchange capacity), specific wastes, application rates, application methods, and crops to be grown; and
- (ii) Describe the procedures used in conducting any tests, including the sample selection criteria, sample size, analytical methods, and statistical procedures.

(4) If the owner or operator intends to conduct field tests or greenhouse studies in order to make the demonstration required under this paragraph, he/she must obtain a permit for conducting such activities.

(b) The owner or operator must comply with the following conditions if cadmium is contained in wastes applied to the treatment zone:

(1)(i) The pH of the waste and soil mixture must be 6.5 or greater at the time of each waste application, except for waste containing cadmium at concentrations of 2 mg/kg (dry weight) or less;

(ii) The annual application of cadmium from waste must not exceed 0.5 kilograms per hectare (kg/ha) on land used for production of tobacco, leafy vegetables, or root crops grown for human consumption. For other food-chain crops, the annual cadmium application rate must not exceed:

Time period	Annual Cd application rate (kilograms per hectare)
Present to June 30, 1984	2.0
July 1, 1984 to December 31, 1986	1.25
Beginning January 1, 1987	0.5

(iii) The cumulative application of cadmium from waste must not exceed 5 kg/ha if the waste and soil mixture has a pH of less than 6.5; and

(iv) If the waste and soil mixture has a pH of 6.5 or greater or is maintained at a pH of 6.5 or greater during crop growth, the cumulative application of cadmium from waste must not exceed: 5 kg/ha if soil cation exchange capacity (CEC) is less than 5 meq/100g; 10 kg/ha if soil CEC is 5-15 meq/100g; and 20 kg/ha if soil CEC is greater than 15 meq/100g; or

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- (2)(i) Animal feed must be the only food-chain crop produced;
  - (ii) The pH of the waste and soil mixture must be 6.5 or greater at the time of waste application or at the time the crop is planted, whichever occurs later, and this pH level must be maintained whenever food-chain crops are grown;
  - (iii) There must be an operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans. The operating plan must describe the measures to be taken to safeguard against possible health hazards from cadmium entering the food chain, which may result from alternative land uses; and
  - (iv) An environmental covenant must be created and recorded in accordance with § 25-15-317, C.R.S. The covenant must state that the property has received waste at high cadmium application rates and must prohibit cultivation of food-chain crops except in accordance with paragraph (b)(2) of this section.

**§ 264.277 [Reserved]**

**§ 264.278 Unsaturated zone monitoring.**

An owner or operator subject to this subpart must establish an unsaturated zone monitoring program to discharge the following responsibilities:

- (a) The owner or operator must monitor the soil and soil-pore liquid to determine whether hazardous constituents migrate out of the treatment zone.
  - (1) The Department will specify the hazardous constituents to be monitored in the facility permit. The hazardous constituents to be monitored are those specified under § 264.271(b).
  - (2) The Department may require monitoring for principal hazardous constituents (PHCs) in lieu of the constituents specified under § 264.271(b). PHCs are hazardous constituents contained in the wastes to be applied at the unit that are the most difficult to treat, considering the combined effects of degradation, transformation, and immobilization. The Director will establish PHCs if he/she finds, based on waste analyses, treatment demonstrations, or other data, that effective degradation, transformation, or immobilization of the PHCs will assure treatment of at least equivalent levels for the other hazardous constituents in the wastes.

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(b) The owner or operator must install an unsaturated zone monitoring system that includes soil monitoring using soil cores and soil-pore liquid monitoring using devices such as lysimeters. The unsaturated zone monitoring system must consist of a sufficient number of sampling points at appropriate locations and depths to yield samples that:

- (1) Represent the quality of background soil-pore liquid quality and the chemical make-up of soil that has not been affected by leakage from the treatment zone; and
- (2) Indicate the quality of soil-pore liquid and the chemical make-up of the soil below the treatment zone.

(c) The owner or operator must establish a background value for each hazardous constituent to be monitored under paragraph (a) of this section. The permit will specify the background values for each constituent or specify the procedures to be used to calculate the background values.

- (1) Background soil values may be based on a one-time sampling at a background plot having characteristics similar to those of the treatment zone.
- (2) Background soil-pore liquid values must be based on at least quarterly sampling for one year at a background plot having characteristics similar to those of the treatment zone.
- (3) The owner or operator must express all background values in a form necessary for the determination of statistically significant increases under paragraph (f) of this section.
- (4) In taking samples used in the determination of all background values, the owner or operator must use an unsaturated zone monitoring system that complies with paragraph (b)(1) of this section.

(d) The owner or operator must conduct soil monitoring and soil-pore liquid monitoring immediately below the treatment zone. The Department will specify the frequency and timing of soil and soil-pore liquid monitoring in the facility permit after considering the frequency, timing, and rate of waste application, and the soil permeability. The owner or operator must express the results of soil and soil-pore liquid monitoring in a form necessary for the determination of statistically significant increases under paragraph (f) of this section.

(e) The owner or operator must use consistent sampling and analysis procedures that are designed to ensure sampling results that provide a reliable indication of soil-pore liquid quality and the chemical make-up of the soil below the treatment zone. At a minimum, the owner or operator must implement procedures and techniques for:

- (1) Sample collection;
- (2) Sample preservation and shipment;

(3) Analytical procedures; and

(4) Chain of custody control.

(f) The owner or operator must determine whether there is a statistically significant change over background values for any hazardous constituent to be monitored under paragraph (a) of this section below the treatment zone each time he/she conducts soil monitoring and soil-pore liquid monitoring under paragraph (d) of this section.

(1) In determining whether a statistically significant increase has occurred, the owner or operator must compare the value of each constituent, as determined under paragraph (d) of this section, to the background value for that constituent according to the statistical procedure specified in the facility permit under this paragraph.

(2) The owner or operator must determine whether there has been a statistically significant increase below the treatment zone within a reasonable time period after completion of sampling. The Department will specify that time period in the facility permit after considering the complexity of the statistical test and the availability of laboratory facilities to perform the analysis of soil and soil-pore liquid samples.

(3) The owner or operator must determine whether there is a statistically significant increase below the treatment zone using a statistical procedure that provides reasonable confidence that migration from the treatment zone will be identified. The Director will specify a statistical procedure in the facility permit that he/she finds:

(i) Is appropriate for the distribution of the data used to establish background values; and

(ii) Provides a reasonable balance between the probability of falsely identifying migration from the treatment zone and the probability of failing to identify real migration from the treatment zone.

(g) If the owner or operator determines, pursuant to paragraph (f) of this section, that there is a statistically significant increase of hazardous constituents below the treatment zone, he/she must:

(1) Notify the Department of this finding in writing within seven days. The notification must indicate what constituents have shown statistically significant increases.

(2) Within 90 days, submit to the Department an application for a permit modification to modify the operating practices at the facility in order to maximize the success of degradation, transformation, or immobilization processes in the treatment zone.

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(h) If the owner or operator determines, pursuant to paragraph (f) of this section, that there is a statistically significant increase of hazardous constituents below the treatment zone, he/she may demonstrate that a source other than regulated units caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. While the owner or operator may make a demonstration under this paragraph in addition to, or in lieu of, submitting a permit modification application under paragraph (g)(2) of this section, he/she is not relieved of the requirement to submit a permit modification application within the time specified in paragraph (g)(2) of this section unless the demonstration made under this paragraph successfully shows that a source other than regulated units caused the increase or that the increase resulted from an error in sampling, analysis, or evaluation. In making a demonstration under this paragraph, the owner or operator must:

- (1) Notify the Department in writing within seven days of determining a statistically significant increase below the treatment zone that he/she intends to make a determination under this paragraph;
- (2) Within 90 days, submit a report to the Department demonstrating that a source other than the regulated units caused the increase or that the increase resulted from error in sampling, analysis, or evaluation;
- (3) Within 90 days, submit to the Department an application for a permit modification to make any appropriate changes to the unsaturated zone monitoring program at the facility; and
- (4) Continue to monitor in accordance with the unsaturated zone monitoring program established under this section.

**§ 264.279 Recordkeeping.**

The owner or operator must include hazardous waste application dates and rates in the operating record required under § 264.73.

**§ 264.280 Closure and post-closure care.**

(a) During the closure period the owner or operator must:

- (1) Continue all operations (including pH control) necessary to maximize degradation, transformation, or immobilization of hazardous constituents within the treatment zone as required under § 264.273(a), except to the extent such measures are inconsistent with paragraph (a)(8) of this section.
- (2) Continue all operations in the treatment zone to minimize run-off of hazardous constituents as required under § 264.273(b);

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- (3) Maintain the run-on control system required under § 264.273(c);
  - (4) Maintain the run-off control system required under § 264.273(d);
  - (5) Control wind dispersal of hazardous waste if required under § 264.273(f);
  - (6) Continue to comply with any prohibitions or conditions concerning growth of food-chain crops under § 264.276;
  - (7) Continue unsaturated zone monitoring in compliance with § 264.278, except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone; and
  - (8) Establish a vegetative cover on the portion of the facility being closed at such time that the cover will not substantially impede degradation, transformation, or immobilization of hazardous constituents in the treatment zone. The vegetative cover must be capable of maintaining growth without extensive maintenance.
  - (9) If the land treatment unit will require post-closure care as a land disposal facility, submit a draft environmental covenant (or proposed modifications to an existing environmental covenant) for the Department's review and approval, and upon approval, record the approved covenant or modifications, as appropriate.
- (b) For the purpose of complying with § 264.115, when closure is completed the owner or operator may submit to the Department certification by an independent qualified soil scientist, in lieu of an independent registered professional engineer, that the facility has been closed in accordance with the specifications in the approved closure plan.
- (c) During the post-closure care period the owner or operator must:
- (1) Continue all operations (including pH control) necessary to enhance degradation and transformation and sustain immobilization of hazardous constituents in the treatment zone to the extent that such measures are consistent with other post-closure activities;
  - (2) Maintain a vegetative cover over closed portions of the facility;
  - (3) Maintain the run-on control system required under § 264.273(c);
  - (4) Maintain the run-off management system required under § 264.273(d);
  - (5) Control wind dispersal of hazardous waste if required under § 264.273(f);
  - (6) Continue to comply with any prohibitions or conditions concerning growth of food-chain crops under § 264.276; and
  - (7) Continue unsaturated zone monitoring in compliance with § 264.278, except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone.

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(d) The owner or operator is not subject to regulation under paragraphs (a)(8) and (c) of this section if the Department finds that the level of hazardous constituents in the treatment zone soil does not exceed the background value of those constituents by an amount that is statistically significant when using the test specified in paragraph (d)(3) of this section. The owner or operator may submit such a demonstration to the Department at any time during the closure or post-closure care periods. For the purposes of this paragraph:

(1) The owner or operator must establish background soil values and determine whether there is a statistically significant increase over those values for all hazardous constituents specified in the facility permit under § 264.271(b).

(i) Background soil values may be based on a one-time sampling of a background plot having characteristics similar to those of the treatment zone.

(ii) The owner or operator must express background values and values for hazardous constituents in the treatment zone in a form necessary for the determination of statistically significant increases under paragraph (d)(3) of this section.

(2) In taking samples used in the determination of background and treatment zone values, the owner or operator must take samples at a sufficient number of sampling points and at appropriate locations and depths to yield samples that represent the chemical make-up of soil that has not been affected by leakage from the treatment zone and the soil within the treatment zone, respectively.

(3) In determining whether a statistically significant increase has occurred, the owner or operator must compare the value of each constituent in the treatment zone to the background value for that constituent using a statistical procedure that provides reasonable confidence that constituent presence in the treatment zone will be identified. The owner or operator must use a statistical procedure that:

(i) Is appropriate for the distribution of the data used to establish background values; and

(ii) Provides a reasonable balance between the probability of falsely identifying hazardous constituent presence in the treatment zone and the probability of failing to identifying real presence in the treatment zone.

(e) The owner or operator is not subject to regulation under Subpart F of these regulations if the Department finds that the owner or operator satisfies paragraph (d) of this section and if unsaturated zone monitoring under § 264.278 indicates that hazardous constituents have not migrated beyond the treatment zone during the active life of the land treatment unit.

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**§ 264.281 Special requirements for ignitable or reactive waste.**

The owner or operator must not apply ignitable or reactive waste to the treatment zone unless the waste and the treatment zone meet all applicable requirements of Part 268, and:

(a) The waste is immediately incorporated into the soil so that:

(1) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under § 261.21 or § 261.23 of these regulations, and

(2) Section 264.17(b) is complied with; or

(b) The waste is managed in such a way that it is protected from any material or conditions which may cause it to ignite or react.

**§ 264.282 Special requirements for incompatible wastes.**

The owner or operator must not place incompatible wastes, or incompatible wastes and materials (See Appendix V of this part for examples), in or on the same treatment zone, unless § 264.17(b) is complied with.

**§ 264.283 Special requirements for hazardous wastes F020, F021, F022, F023, F026, and F027.**

(a) Hazardous Wastes F020, F021, F022, F023, F026, F027 must not be placed in a land treatment unit unless the owner or operator operates the facility in accordance with a management plan for these wastes that is approved by the Department pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

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(b) The Department may determine that additional design, operating, and monitoring requirements are necessary for land treatment facilities managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

**§§ 264.284 through 264.299 [Reserved]**

**Subpart N -- Landfills**

**§ 264.300 Applicability.**

The regulations in this subpart apply to owners or operators of facilities that dispose of hazardous waste in landfills, except as § 264.1 provides otherwise.

**§ 264.301 Design and operating requirements.**

(a) Any landfill that is not covered by paragraph (c) of this section or § 265.301(a) of these regulations must have a liner system for all portions of the landfill (except for existing portions of such landfill). The liner system must have:

(1) A liner that is designed, constructed, and installed to prevent any migration of wastes out of the landfill to the adjacent subsurface soil or ground water or surface water at anytime during the active life (including the closure period) of the landfill. The liner must be constructed of materials that prevent wastes from passing into the liner during the active life of the facility. The liner must be:

(i) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or leachate to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation;

(ii) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(iii) Installed to cover all surrounding earth likely to be in contact with the waste or leachate; and

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(2) A leachate collection and removal system immediately above the liner that is designed, constructed, maintained, and operated to collect and remove leachate from the landfill. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must be:

(i) Constructed of materials that are:

(A) Chemically resistant to the waste managed in the landfill and the leachate expected to be generated; and

(B) Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and by any equipment used at the landfill; and

(ii) Designed and operated to function without clogging through the scheduled closure of the landfill.

(b) The owner or operator will be exempted from the requirements of paragraph (a) of this section if the Department finds, based on a demonstration by the owner or operator, that alternative design and operating practices, together with location characteristics, will prevent the migration of any hazardous constituents (see § 264.93) into the ground water or surface water at any future time. In deciding whether to grant an exemption, the Department will consider:

(1) The nature and quantity of the wastes;

(2) The proposed alternate design and operation;

(3) The hydrogeologic setting of the facility, including the attenuative capacity and thickness of the liners and soils present between the landfill and ground water or surface water; and

(4) All other factors which would influence the quality and mobility of the leachate produced and the potential for it to migrate to ground water or surface water.

(c) The owner or operator of each new landfill unit on which construction commences after January 29, 1992, each lateral expansion of a landfill unit on which construction commences after July 29, 1992, and each replacement of an existing landfill unit that is to commence reuse after July 29, 1992 must install two or more liners and a leachate collection and removal system above and between such liners. "Construction commences" is as defined in § 260.10 of these regulations under "existing facility".

(1)(i) The **liner system** must include:

(A) A top liner designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into such liner during the active life and post-closure care period; and

(B) A composite bottom liner, consisting of at least two components. The upper component must be designed and constructed of materials (e.g., a geomembrane) to prevent the migration of hazardous constituents into this component during the active life and post-closure care period. The lower component must be designed and constructed of materials to minimize the migration of hazardous constituents if a breach in the upper component were to occur. The lower component must be constructed of at least 3 feet (91 cm) of compacted soil material with a hydraulic conductivity of no more than  $1 \times 10^{-7}$  cm/sec.

(ii) The liners must comply with paragraphs (a)(1)(i), (ii), and (iii) of this section.

(2) The **leachate collection and removal system** immediately above the top liner must be designed, constructed, operated, and maintained to collect and remove leachate from the landfill during the active life and post-closure care period. The Department will specify design and operating conditions in the permit to ensure that the leachate depth over the liner does not exceed 30 cm (one foot). The leachate collection and removal system must comply with paragraphs (c)(3)(iii) and (iv) of this section.

(3) The **leachate collection and removal system** between the liners, and immediately above the bottom composite liner in the case of multiple leachate collection and removal systems, is also a **leak detection system**. This leak detection system must be capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time through all areas of the top liner likely to be exposed to waste or leachate during the active life and post-closure care period. The requirements for a leak detection system in this paragraph are satisfied by installation of a system that is, at a minimum:

(i) Constructed with a bottom slope of one percent or more;

(ii) Constructed of granular drainage materials with a hydraulic conductivity of  $1 \times 10^{-2}$  cm/sec or more and a thickness of 12 inches (30.5 cm) or more; or constructed of synthetic or geonet drainage materials with a transmissivity of  $3 \times 10^{-5}$  m<sup>2</sup>/sec or more;

(iii) Constructed of materials that are chemically resistant to the waste managed in the landfill and the leachate expected to be generated, and of sufficient strength and thickness to prevent collapse under the pressures exerted by overlying wastes, waste cover materials, and equipment used at the landfill;

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(iv) Designed and operated to minimize clogging during the active life and post- closure care period; and

(v) Constructed with sumps and liquid removal methods (e.g., pumps) of sufficient size to collect and remove liquids from the sump and prevent liquids from backing up into the drainage layer. Each unit must have its own sump(s). The design of each sump and removal system must provide a method for measuring and recording the volume of liquids present in the sump and of liquids removed.

(4) The owner or operator shall collect and remove pumpable liquids in the leak detection system sumps to minimize the head on the bottom liner.

(5) The owner or operator of a leak detection system that is not located completely above the seasonal high water table must demonstrate that the operation of the leak detection system will not be adversely affected by the presence of ground water.

(d) The Department may approve alternative design or operating practices to those specified in paragraph (c) of this section if the owner or operator demonstrates to the Department that such design and operating practices, together with location characteristics:

(1) Will prevent the migration of any hazardous constituent into the ground water or surface water at least as effectively as the liners and leachate collection and removal systems specified in paragraph (c) of this section; and

(2) Will allow detection of leaks of hazardous constituents through the top liner at least as effectively.

(e) The double liner requirement set forth in paragraph (c) of this section may be waived by the Department for any monofill, if:

(1) The monofill contains only hazardous wastes from foundry furnace emission controls or metal casting molding sand, and such wastes do not contain constituents which would render the wastes hazardous for reasons other than the Toxicity Characteristic in § 261.24 of these regulations, with EPA Hazardous Waste Numbers D004 through D017; and

(2)(i)(A) The monofill has at least one liner for which there is no evidence that the liner is leaking;

(B) The monofill is located more than one-quarter mile from an underground source of drinking water (as that term is defined in 40 CFR § 144.3); and

(C) The monofill is in compliance with generally applicable ground water monitoring requirements for facilities with permits under RCRA 3005(c) [42 U.S.C. § 6925(c)]; or

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(ii) The owner or operator demonstrates that the monofill is located, designed, and operated so as to assure that there will be no migration of any hazardous constituent into ground water or surface water at any future time.

(f) The owner or operator of any replacement landfill unit is exempt from paragraph (c) of this section if:

(1) The existing unit was constructed in compliance with the design standards of section 3004(o)(1)(A)(i) and (o)(5) of the Resource Conservation and Recovery Act [42 U.S.C. § 6924(o)]; and

(2) There is no reason to believe that the liner is not functioning as designed.

(g) The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 100-year storm.

(h) The owner or operator must design, construct, operate, and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 100-year storm.

(i) Collection and holding facilities(e.g., tanks or basins) associated with run-on and run-off control systems must be emptied or otherwise managed expeditiously after storms to maintain design capacity of the system.

(j) If the landfill contains any particulate matter which may be subject to wind dispersal, the owner or operator must cover or otherwise manage the landfill to control wind dispersal.

(k) The Department will specify in the permit all design and operating practices that are necessary to ensure that the requirements of this section are satisfied.

**§ 264.302 Action leakage rate.**

(a) The Department shall approve an action leakage rate for landfill units subject to § 264.301(c) or (d). The action leakage rate is the maximum design flow rate that the leak detection system (LDS) can remove without the fluid head on the bottom liner exceeding 1 foot. The action leakage rate must include an adequate safety margin to allow for uncertainties in the design (e.g., slope, hydraulic conductivity, thickness of drainage material), construction, operation, and location of the LDS, waste and leachate characteristics, likelihood and amounts of other sources of liquids in the LDS, and proposed response actions (e.g., the action leakage rate must consider decreases in the flow capacity of the system over time resulting from siltation and clogging, rib layover and creep of synthetic components of the system, overburden pressures, etc.).

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(b) To determine if the action leakage rate has been exceeded, the owner or operator must convert the weekly or monthly flow rate from the monitoring data obtained under § 264.303(c), to an average daily flow rate (gallons per acre per day) for each sump. Unless the Department approves a different calculation, the average daily flow rate for each sump must be calculated weekly during the active life and closure period, and monthly during the post-closure care period when monthly monitoring is required under § 264.303(c).

### § 264.303 Monitoring and inspection.

(a) During construction or installation, liners (except in the case of existing portions of landfills exempt from § 264.301(a)) and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation:

- (1) Synthetic liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters; and
- (2) Soil-based and admixed liners and covers must be inspected for imperfections including lenses, cracks, channels, root holes, or other structural non-uniformities that may cause an increase in the permeability of the liner or cover.

(b) While a landfill is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:

- (1) Deterioration, malfunctions, or improper operation of run-on and run-off control systems;
- (2) Proper functioning of wind dispersal control systems, where present; and
- (3) The presence of leachate in and proper functioning of leachate collection and removal systems, where present.

(c)(1) An owner or operator required to have a leak detection system under § 264.301(c) or (d) must record the amount of liquids removed from each leak detection system sump at least once each week during the active life and closure period.

- (2) After the final cover is installed, the amount of liquids removed from each leak detection system sump must be recorded at least monthly. If the liquid level in the sump stays below the pump operating level for two consecutive months, the amount of liquids in the sumps must be recorded at least quarterly. If the liquid level in the sump stays below the pump operating level for two consecutive quarters, the amount of liquids in

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the sumps must be recorded at least semi-annually. If at any time during the post-closure care period the pump operating level is exceeded at units on quarterly or semi-annual recording schedules, the owner or operator must return to monthly recording of amounts of liquids removed from each sump until the liquid level again stays below the pump operating level for two consecutive months.

(3) "Pump operating level" is a liquid level proposed by the owner or operator and approved by the Department based on pump activation level, sump dimensions, and level that avoids backup into the drainage layer and minimizes head in the sump.

**§ 264.304 Response actions.**

(a) The owner or operator of landfill units subject to § 264.301(c) or (d) must have an approved response action plan before receipt of waste. The response action plan must set forth the actions to be taken if the action leakage rate has been exceeded. At a minimum, the response action plan must describe the actions specified in paragraph (b) of this section.

(b) If the flow rate into the leak detection system exceeds the action leakage rate for any sump, the owner or operator must:

(1) Notify the Department in writing of the exceedence within 7 days of the determination;

(2) Submit a preliminary written assessment to the Department within 14 days of the determination, as to the amount of liquids, likely sources of liquids, possible location, size, and cause of any leaks, and short-term actions taken and planned;

(3) Determine to the extent practicable the location, size, and cause of any leak;

(4) Determine whether waste receipt should cease or be curtailed, whether any waste should be removed from the unit for inspection, repairs, or controls, and whether or not the unit should be closed;

(5) Determine any other short-term and longer-term actions to be taken to mitigate or stop any leaks; and

(6) Within 30 days after the notification that the action leakage rate has been exceeded, submit to the Department the results of the analyses specified in paragraphs (b)(3), (4), and (5) of this section, the results of actions taken, and actions planned. Monthly thereafter, as long as the flow rate in the leak detection system exceeds the action leakage rate, the owner or operator must submit to the Department a report summarizing the results of any remedial actions taken and actions planned.

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(c) To make the leak and/or remediation determinations in paragraphs (b)(3), (4), and (5) of this section, the owner or operator must:

- (1)(i) Assess the source of liquids and amounts of liquids by source,
  - (ii) Conduct a fingerprint, hazardous constituent, or other analyses of the liquids in the leak detection system to identify the source of liquids and possible location of any leaks, and the hazard and mobility of the liquid; and
  - (iii) Assess the seriousness of any leaks in terms of potential for escaping into the environment; or
- (2) Document why such assessments are not needed.

**§§ 264.305 through 264.308 [Reserved]**

**§ 264.309 Surveying and recordkeeping.**

The owner or operator of a landfill must maintain the following items in the operating record required under § 264.73:

- (a) On a map, the exact location and dimensions, including depth, of each cell with respect to permanently surveyed benchmarks; and
- (b) The contents of each cell and the approximate location of each hazardous waste type within each cell.

**§ 264.310 Closure and post-closure care.**

(a) At final closure of the landfill or upon closure of any cell, the owner or operator must cover the landfill or cell with a final cover designed and constructed to:

- (1) Provide long-term minimization of migration of liquids through the closed landfill;
- (2) Function with minimum maintenance;
- (3) Promote drainage and minimize erosion or abrasion of the cover;
- (4) Accommodate settling and subsidence so that the cover's integrity is maintained; and
- (5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present.

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(b) After the final closure, the owner or operator must comply with all post-closure requirements contained in §§ 264.117 through 264.120, including maintenance and monitoring throughout the post-closure care period (specified in the permit under § 264.117). The owner or operator must:

- (1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cap as necessary to correct the effects of settling, subsidence, erosion, or other events;
- (2) Continue to operate the leachate collection and removal system until leachate is no longer detected;
- (3) Maintain and monitor the leak detection system in accordance with §§ 264.301(c)(3)(iv) and (4) and 264.303(c), and comply with all other applicable leak detection system requirements of this part;
- (4) Maintain and monitor the ground-water monitoring system and comply with all other applicable requirements of Subpart F of this Part;
- (5) Prevent run-on and run-off from eroding or otherwise damaging the final cover; and
- (6) Protect and maintain surveyed benchmarks used in complying with § 264.309.

## **§ 264.311 [Reserved]**

### **§ 264.312 Special requirements for ignitable or reactive waste.**

(a) Except as provided in paragraph (b) of this section, and in § 264.316, ignitable or reactive waste must not be placed in a landfill, unless the waste and landfill meet all applicable requirements of Part 268, and:

- (1) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under § 261.21 or § 261.23 of these regulations, and
- (2) Section 264.17(b) is complied with.

(b) Except for prohibited wastes which remain subject to treatment standards in subpart D of part 268, ignitable wastes in containers may be landfilled without meeting the requirements of paragraph (a) of this section, provided that the wastes are disposed of in such a way that they are protected from any material or conditions which may cause them to ignite. At a minimum, ignitable wastes must be disposed of in non-leaking containers which are carefully handled and placed so as to avoid heat, sparks, rupture, or any other condition that might cause ignition of the wastes; must be covered daily with soil or other

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non-combustible material to minimize the potential for ignition of the wastes; and must not be disposed of in cells that contain or will contain other wastes which may generate heat sufficient to cause ignition of the waste.

### § 264.313 Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials, (See Appendix V of this part for examples) must not be placed in the same landfill cell, unless § 264.17(b) is complied with.

### § 264.314 Special requirements for bulk and containerized liquids.

- (a) The placement of bulk or non-containerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited.
- (b) To demonstrate the absence or presence of free liquids in either a containerized or a bulk waste, the following test must be used: Method 9095B (Paint Filter Liquids Test) as described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" EPA Publication SW 846, as incorporated by reference in § 260.11 of these regulations.
- (c) Containers holding free liquids must not be placed in a landfill unless:
- (1) All free-standing liquid: (i) has been removed by decanting, or other methods; (ii) has been mixed with sorbent or solidified so that free-standing liquid is no longer observed; or (iii) has been otherwise eliminated; or
  - (2) The container is very small, such as an ampule; or
  - (3) The container is designed to hold free liquids for use other than storage, such as a battery or capacitor; or
  - (4) The container is a lab pack as defined in § 264.316 and is disposed of in accordance with § 264.316.
- (d) Sorbents used to treat free liquids to be disposed of in landfills must be nonbiodegradable. Nonbiodegradable sorbents are: materials listed or described in paragraph (e)(1) of this section; materials that pass one of the tests in paragraph (e)(2) of this section; or materials that are determined by EPA to be nonbiodegradable through the Part 260 petition process.

(1) Nonbiodegradable sorbents.

- (i) Inorganic minerals, other inorganic materials, and elemental carbon (e.g., aluminosilicates, clays, smectites, Fuller's earth, bentonite, calcium bentonite, montmorillonite, calcined montmorillonite, kaolinite, micas (illite), vermiculites, zeolites; calcium carbonate (organic free limestone); oxides/hydroxides, alumina, lime, silica

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(sand), diatomaceous earth; perlite (volcanic glass); expanded volcanic rock; volcanic ash; cement kiln dust; fly ash; rice hull ash; activated charcoal/activated carbon); or

(ii) High molecular weight synthetic polymers (e.g., polyethylene, high density polyethylene (HDPE), polypropylene, polystyrene, polyurethane, polyacrylate, polynorborene, polyisobutylene, ground synthetic rubber, cross-linked allylstyrene and tertiary butyl copolymers). This does not include polymers derived from biological material or polymers specifically designed to be degradable; or

(iii) Mixtures of these nonbiodegradable materials.

(2) Tests for nonbiodegradable sorbents.

(i) The sorbent material is determined to be nonbiodegradable under ASTM Method G21-70 (1984a)-Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi; or

(ii) The sorbent material is determined to be nonbiodegradable under ASTM Method G22-76 (1984b)-Standard Practice for Determining Resistance of Plastics to Bacteria.

(iii) The sorbent material is determined to be non-biodegradable under the Organization for Economic Cooperation and Development (OECD) test 301B: [CO<sub>2</sub> Evolution (Modified Sturm Test), July 1992].

(e) The placement of any free liquid, including a hazardous waste, in a landfill is prohibited.

**§ 264.315 Special requirements for containers.**

Unless they are very small, such as an ampule, containers must be either:

(a) At least 90 percent full when placed in the landfill; or

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(b) Crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.

**§ 264.316 Disposal of small containers of hazardous waste in overpacked drums (lab packs).**

Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if the following requirements are met:

(a) Hazardous waste must be packaged in non-leaking inside containers. The inside containers must be of a design and constructed of a material that will not react dangerously with, be decomposed by, or be ignited by the contained waste. Inside containers must be tightly and securely sealed. The inside containers must be of the size and type specified in the Department of Transportation (DOT) hazardous materials regulations (49 CFR Parts 173, 178, and 179), if those regulations specify a particular inside container for the waste.

(b) The inside containers must be overpacked in an open head DOT-specification metal shipping container (49 CFR Parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with § 264.314(e), to completely sorb all of the liquid contents of the inside containers. The metal outer container must be full after it has been packed with inside containers and sorbent material.

(c) The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers in accordance with § 264.17(b).

(d) Incompatible wastes, as defined in § 260.10 of these regulations, must not be placed in the same outside container.

(e) Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in § 261.23(a)(5) of these regulations, must be treated or rendered non-reactive prior to packaging in accordance with paragraphs (a) through (d) of this section. Cyanide- and sulfide-bearing reactive waste may be packed in accordance with paragraphs (a) through (d) of this section without first being treated or rendered non-reactive.

(f) Such disposal is in compliance with the requirements of Part 268. Persons who incinerate lab packs according to the requirements in § 268.42(c)(1) may use fiber drums in place of metal outer containers. Such fiber drums must meet the DOT specifications in 49 CFR § 173.12 and be overpacked according to the requirements in paragraph (b) of this section.

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**§ 264.317 Special requirements for hazardous wastes F020, F021, F022, F023, F026, and F027.**

(a) Hazardous Wastes F020, F021, F022, F023, F026, and F027 must not be placed in a landfill unless the owner or operator operates the landfill in accord with a management plan for these wastes that is approved by the Department pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this Part. The factors to be considered are:

- (1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere;
- (2) The attenuative properties of underlying and surrounding soils or other materials;
- (3) The mobilizing properties of other materials co-disposed with these wastes; and
- (4) The effectiveness of additional treatment, design, or monitoring requirements.

(b) The Department may determine that additional design, operating, and monitoring requirements are necessary for landfills managing hazardous wastes F020, F021, F022, F023, F026, and F027 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

**§ 264.318 - § 264.339 [Reserved]**

**Subpart O – Incinerators, Boilers and Industrial Furnaces**

**§ 264.340 Applicability.**

(a) The regulations in this subpart apply to owners or operators of facilities that incinerate hazardous waste, except as § 264.1 provides otherwise. The following facility owners or operators are considered to incinerate hazardous waste:

(1) Owners or operators of hazardous waste incinerators (as defined in § 260.10 of these regulations); and

(2) Owners or operators who burn or process hazardous waste in boilers or industrial furnaces (as defined in § 260.10 of these regulations) irrespective of the purpose of burning or processing, except as provided by paragraphs (b), (c), (d), (e), (g) and (h) of this section. In this subpart, the term “burn” means burning for energy recovery or destruction, or processing for materials recovery or as an ingredient. The emission standards of §§ 264.342, 264.343, 264.344, and 264.345 apply to facilities operating under interim status or under a RCRA permit as specified in §§ 264.340 and 265.140.

(b) After consideration of the waste analysis included with Part B of the permit application, the Department, in establishing the permit conditions, may exempt the applicant from all requirements of this subpart except § 264.341 (Waste analysis) and § 264.346(h)(Closure), § 264.346(f) (standards for direct transfer), § 264.347 (regulation of residues) and the applicable requirements of subparts BB and CC of Parts 264 and 265 of these regulations.

(1) If the Department finds that the waste to be burned is:

(i) Listed as a hazardous waste in Part 261, Subpart D, of these regulations solely because it is ignitable (Hazard Code I), corrosive (Hazard Code C), or both; or

(ii) Listed as a hazardous waste in Part 261, Subpart D, of these regulations solely because it is reactive (Hazard Code R) for characteristics other than those listed in § 261.23 (a)(4) and (5), and will not be burned when other hazardous wastes are present in the combustion zone; or

(iii) A hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the test for characteristics of hazardous wastes under Part 261, Subpart C, of these regulations; or

(iv) A hazardous waste solely because it possesses any of the reactivity characteristics described by § 261.23(a)(1), (2), (3), (6), (7), and (8) of these regulations, and will not be burned when other hazardous wastes are present in the combustion zone; and

(2) If the waste analysis shows that the waste contains none of the hazardous constituents listed in Part 261, Appendix VIII, of these regulations, which would reasonably be expected to be in the waste.

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(c) If the waste to be burned is one which is described by paragraphs (b)(1)(i), (b)(1)(ii), (b)(1)(iii), or (b)(1)(iv) of this Section and contains insignificant concentrations of the hazardous constituents listed in Part 261, Appendix VIII, of these regulations, then the Department may, in establishing permit conditions, exempt the applicant from all requirements of this Subpart, except § 264.341 (Waste analysis), § 264.346(h)(Closure), § 264.346(f) (Standards for direct transfer) and § 264.347 (Regulation of residues), after consideration of the waste analysis included with Part B of the permit application, unless the Department finds that the waste will pose a threat to human health and the environment when burned in an incinerator, boiler or industrial furnace.

(d) The following hazardous wastes and facilities are not subject to regulation under this subpart:

- (1) Used oil burned for energy recovery that is also a hazardous waste solely because it exhibits a characteristic of hazardous waste identified in Subpart C of Part 261 of these regulations. Such used oil is subject to regulation under Part 279 of these regulations;
- (2) Gas recovered from hazardous or solid waste landfills when such gas is burned for energy recovery;
- (3) Hazardous wastes that are exempt from regulation under §§ 261.4 and 261.6(a)(3)(iii) and (iv) of these regulations, and hazardous wastes that are subject to the special requirements for conditionally exempt small quantity generators under § 261.5 of these regulations; and
- (4) Coke ovens, if the only hazardous waste burned is EPA Hazardous Waste No. K087, decanter tank tar sludge from coking operations.

(e) Owners and operators of smelting, melting, and refining furnaces (including pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces, but not including cement kilns, aggregate kilns, or halogen acid furnaces burning hazardous waste) that process hazardous waste solely for metal recovery are conditionally exempt from regulation under this subpart, except for § 264.347.

- (1) To be exempt from §§ 264.341 through 264.346, and 265.140, an owner or operator of a metal recovery furnace or mercury recovery furnace must comply with the following requirements, except that an owner or operator of a lead or a nickel-chromium recovery furnace, or a metal recovery furnace that burns baghouse bags used to capture metallic dusts emitted by steel manufacturing, must comply with the requirements of paragraph (e)(3) of this section, and owners or operators of lead recovery furnaces that are subject to regulation under the Secondary Lead Smelting NESHAP must comply with the requirements of paragraph (h) of this section.

(i) Provide a one-time written notice to the Director indicating the following:

- (A) The owner or operator claims exemption under this paragraph;
- (B) The hazardous waste is burned solely for metal recovery consistent with the provisions of paragraph (e)(2) of this section;
- (C) The hazardous waste contains recoverable levels of metals; and

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- (D) The owner or operator will comply with the sampling and analysis and recordkeeping requirements of this paragraph;
- (ii) Sample and analyze the hazardous waste and other feedstocks as necessary to comply with the requirements of this paragraph by using appropriate methods; and
- (iii) Maintain at the facility for at least three years records to document compliance with the provisions of this paragraph including limits on levels of toxic organic constituents and Btu value of the waste, and levels of recoverable metals in the hazardous waste compared to normal nonhazardous waste feedstocks.
- (2) A hazardous waste meeting either of the following criteria is not processed solely for metal recovery:
- (i) The hazardous waste has a total concentration of organic compounds listed in Part 261, Appendix VIII, of these regulations exceeding 500 ppm by weight, as-fired, and so is considered to be burned for destruction. The concentration of organic compounds in a waste as-generated may be reduced to the 500 ppm limit by *bona fide* treatment that removes or destroys organic constituents. Blending for dilution to meet the 500 ppm limit is prohibited and documentation that the waste has not been impermissibly diluted must be retained in the records required by paragraph (e)(1)(iii) of this section; or
- (ii) The hazardous waste has a heating value of 5,000 Btu/lb or more, as-fired, and so is considered to be burned as fuel. The heating value of a waste as-generated may be reduced to below the 5,000 Btu/lb limit by *bona fide* treatment that removes or destroys organic constituents. Blending for dilution to meet the 5,000 Btu/lb limit is prohibited and documentation that the waste has not been impermissibly diluted must be retained in the records required by paragraph (e)(1)(iii) of this section.
- (3) To be exempt from §§ 264.341 through 264.346, and 265.140, an owner or operator of a lead or nickel-chromium or mercury recovery furnace, except for owners or operators of lead recovery furnaces subject to regulation under the Secondary Lead Smelting NESHAP, or a metal recovery furnace that burns baghouse bags used to capture metallic dusts emitted by steel manufacturing, must provide a one-time written notice to the Department identifying each hazardous waste burned and specifying whether the owner or operator claims an exemption for each waste under this paragraph or paragraph (e)(1) of this section. The owners or operator must comply with the requirements of paragraph (e)(1) of this section for those waste claimed to be exempt under that paragraph and must comply with the requirements below for those wastes claimed to be exempt under this paragraph (e)(3).

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(i) The hazardous wastes listed in Appendices XI, XII, and XIII to § 264.348 of these regulations, and baghouse bags used to capture metallic dusts emitted by steel manufacturing are exempt from the requirements of paragraph (e)(1) of this section, provided that:

(A) A waste listed in Appendix XI to § 264.348 of these regulations must contain recoverable levels of lead, a waste listed in Appendix XII to § 264.348 of these regulations must contain recoverable levels of nickel or chromium, a waste listed in Appendix XIII to § 264.348 of these regulations must contain recoverable levels of mercury and contain less than 500 ppm of Part 261, Appendix VIII organic constituents, and baghouse bags used to capture metallic dusts emitted by steel manufacturing must contain recoverable levels of metal; and

(B) The waste does not exhibit the Toxicity Characteristic of § 261.24 of these regulations for an organic constituent; and

(C) The waste is not a hazardous waste listed in Subpart D of Part 261 of these regulations because it is listed for an organic constituent as identified in Appendix VII of Part 261 of these regulations; and

(D) The owner or operator certifies in the one-time notice that hazardous waste is burned under the provisions of paragraph (e)(3) of this section and that sampling and analysis will be conducted or other information will be obtained as necessary to ensure continued compliance with these requirements. Sampling and analysis shall be conducted according to paragraph (e)(1)(ii) of this section and records to document compliance with paragraph (e)(3) of this section shall be kept for at least three years.

(ii) The Director may decide on a case-by-case basis that the toxic organic constituents in a material listed in Appendices XI, XII, or XIII to § 264.348 of these regulations that contains a total concentration of more than 500 ppm toxic organic compounds listed in Appendix VIII to Part 261 of these regulations, may pose a hazard to human health and the environment when burned in a metal recovery furnace exempt from the requirements of this subpart. In that situation, after adequate notice and opportunity for comment, the metal recovery furnace will become subject to the requirements of this subpart when burning that material. In making the hazard determination, the Director will consider the following factors:

(A) The concentration and toxicity of organic constituents in the material; and

(B) The level of destruction of toxic organic constituents provided by the furnace; and

(C) Whether the acceptable ambient levels established in Appendices IV or V to § 264.348 of these regulations may be exceeded for any toxic organic compound that may be emitted based on dispersion modeling to predict the maximum annual average off-site ground level concentration.

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(f) [Reserved].

(g) Owners and operators of smelting, melting, and refining furnaces (including pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces) that process hazardous waste for recovery of economically significant amounts of the precious metals gold, silver, platinum, palladium, iridium, osmium, rhodium, or ruthenium, or any combination of these are conditionally exempt from regulation under this subpart, except for § 264.347. To be exempt from §§ 264.341 through 264.346, and 265.140, an owner or operator must:

(1) Provide a one-time written notice to the Director indicating the following:

(i) The owner or operator claims exemption under this paragraph;

(ii) The hazardous waste is burned for legitimate recovery of precious metal; and

(iii) The owner or operator will comply with the sampling and analysis and recordkeeping requirements of this paragraph; and

(2) Sample and analyze the hazardous waste as necessary to document that the waste contains economically significant amounts of the metals and that the treatment recovers economically significant amounts of precious metal; and

(3) Maintain at the facility for at least three years records to document that all hazardous wastes burned are burned for recovery of economically significant amounts of precious metal.

(h) Owners or operators of lead recovery furnaces that process hazardous waste for recovery of lead and that are subject to regulation under the Secondary Lead Smelting NESHAP, are conditionally exempt from regulation under this subpart. To be exempt, an owner or operator must provide a one-time notice to the Director identifying each hazardous waste burned and specifying that the owner or operator claims an exemption under this paragraph. The notice also must state that the waste burned has a total concentration of non-metal compounds listed in Part 261, Appendix VIII, of these regulations of less than 500 ppm by weight, as fired and as provided in paragraph (e)(2)(i) of this section, or is listed in Appendix XI to § 264.348 of these regulations.

**§ 264.341 Waste analysis.**

(a) In addition to the general waste analysis requirements in § 264.13 of these regulations, and as a portion of the trial burn plan required by § 100.28 of these regulations, the owner or operator must have included an analysis of the waste feed sufficient to provide all information required by § 100.28(c) of these regulations. The owner or operator must provide an analysis of the hazardous waste that quantifies the concentration of any constituent identified in Appendix VIII of Part 261 of this chapter that may reasonably be expected to be in the waste. Such constituents must be identified and quantified if present, at levels detectable by using appropriate analytical procedures. The Appendix VIII, Part 261 constituents excluded from this analysis must be identified and the basis for their exclusion explained. This analysis will be used to provide all information required by this subpart and §§ 100.41(b)(5) and 100.28(c) of these regulations and to enable the permit writer to prescribe such permit conditions as necessary to protect human health and the

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environment. Such analysis must be included as a portion of the part B permit application, or, for facilities operating under the interim status standards of this subpart, as a portion of the trial burn plan that may be submitted before the part B application under provisions of § 100.28(g) of these regulations as well as any other analysis required by the permit authority in preparing the permit. Owners or operators of new hazardous waste incinerators, boilers or industrial furnaces must provide the information required by § 100.28 or § 100.41(b)(5) of these regulations to the greatest extent possible.

(b) Throughout normal operation the owner or operator must conduct sufficient waste analysis to verify that waste feed to the incinerator is within the physical and chemical composition limits specified in the facility's permit (under § 264.346).

### § 264.342 Risk Based Performance Standards for Hazardous Constituents

(a) Owners or operators of incinerators, boilers, or industrial furnaces burning hazardous waste must conduct both a pre-trial burn and post-trial burn Multi-Pathway Health Risk Assessment (MPHRA). The Director will utilize the results of the MPHRA to evaluate and develop risk-based, constituent specific permit emission standards.

(1) The pre-trial burn and post-trial burn MPHRA must be completed in accordance with § 100.28 of these regulations and in accordance with procedures and methodologies approved by the Director. The MPHRA must consider both direct inhalation exposure and indirect exposure pathways for the full suite of compounds examined during the approved trial burn(s). The pre-trial burn MPHRA must be submitted with the permit application. The post-trial burn MPHRA must be completed and submitted following the trial burn.

(i) The acceptable performance standard target level for the results of a MPHRA is a total added lifetime cancer risk (ALCR) target level of  $1 \text{ E-}6$ , ( $1 \times 10^{-6}$ ), and a hazard index (HI) of  $< 0.25$  for non-carcinogens, using equations (1) - (6) of paragraph (a)(3) of this section as appropriate.

(ii) The performance standard applies at the location of the hypothetical Most Exposed Individual (MEI), using an acceptable dispersion model approved by the Director. When more than one stack is present at the permitted facility, the performance standard applies to the cumulative risk from all devices with stack emissions regulated under this Subpart.

(iii) The MPHRA must include an evaluation of the acute inhalation exposure resulting from facility short-term emissions. The Director may utilize the results of the acute inhalation exposure evaluation to develop permit emission standards applicable to the hazardous waste combustion system during non-steady state operation (i.e. unit startup and shutdown).

(2) Compliance with the permit emission standards during the operational period of an incinerator, boiler, or industrial furnace will be evaluated by comparing the results of the stack testing required under § 264.346(j) of these regulations to the appropriate emission standards in the permit. An incinerator, boiler, or industrial furnace burning hazardous waste may not emit any hazardous constituents in excess of an applicable permit emission standard.

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(i) The Permittee may modify an emission standard in the permit during the operational period of an incinerator, boiler, or industrial furnace in accordance with § 100.63 of these regulations.

(ii) The Director may require that a MPHRA be repeated at any time a permit emission standard is proposed for modification as necessary to ensure that the acceptable performance standard described in (a)(1) of this section is achieved.

(3) Equations for use with health risk based performance standards. The following equations will be used to assess compliance with the health risk based performance standards of this subpart. Use of any alternative methodology to calculate health risks, must be approved by the Director in writing.

(i) FOR CARCINOGENS: For each compound "i", and each class of compound "j", examined during trial burn, the following standard equations are to be used:

$$ALCR_j = \sum_{i=1}^n \text{Calculated (or Measured) Dose}_{(i)} \times \text{Slope Factor}_{(i)} \quad (1)$$

$$ALCR_{total} = ALCR_{metals} + ALCR_{PCDD/F} + ALCR_{PIC} \quad (2)$$

$$ALCR_{total} < 1.0 \text{ E-}6 \quad (3)$$

where:

ALCR = Accumulated Lifetime Cancer Risk

ALCR<sub>PCDD/F</sub> = Accumulated Lifetime Cancer Risk from all polychlorinated dibenzo-p-dioxins and dibenzofurans.

ALCR<sub>PIC</sub> = Accumulated Lifetime Cancer Risk from organic products of incomplete combustion.

n = number of carcinogenic compounds being evaluated in the risk assessment;

j = type of carcinogenic compounds (ie., metals, PCDD/F, and organic PICs);

Calculated or measured dose of compound "i" for the MEI is determined from the predicted ambient concentration of "i" using dispersion modeling;

Slope Factor or Carcinogenic Potency Factor (or Agency-accepted health based standard)

(ii) FOR NONCARCINOGENS: For calculation of the Hazard Index (HI) for noncarcinogenic effects, or for the total estimated Hazard Quotient (HQ) for each compound "i", the following standard equations are to be used:

$$HI_{(i)} = \sum_{i=1}^n HQ_1 + HQ_2 + HQ_n \leq 0.25 \quad (4)$$

$$HI = \sum_{i=1}^n \frac{\text{Calculated (Or measured) Dose}_{(i)}}{\text{Reference Dose}_{(i)}} < 0.25 \quad (5)$$

OR:

$$HI = \sum_{i=1}^n \frac{\text{Calculated (Or measured) Concentration}_{(i)}}{\text{Reference Concentration}_{(i)}} < 0.25 \quad (6)$$

where:

Calculated or measured dose of compound "i" for the MEI is determined from the predicted ambient concentration of "i" using dispersion modeling;

Reference Dose (RfD), or Reference Concentration (RfC), where available of compound "i" is the Agency-accepted health based standard;

n = number of noncarcinogenic compounds with adverse effect on same organ;

**NOTE:** If the HI is greater than or equal to 0.25, a more detailed comparison of risks across adverse health effects for each compound and organ may be performed by the owner or operator and/or the Director, to more accurately refine estimated health effects.

**(b) Performance standards to control organic emissions.**

(1) **DRE standard-General.** Except as provided in paragraph (b)(3) of this section, an incinerator or burner or industrial furnace burning hazardous waste must achieve a destruction and removal efficiency (DRE) of 99.99% for all organic hazardous constituents in the waste feed. To demonstrate conformance with this requirement, 99.99% DRE must be demonstrated during a trial burn for each principal organic hazardous constituent (POHC) designated (under paragraph (b)(2) of this section) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$DRE = \left[ 1 - \frac{W_{out}}{W_{in}} \right] \times 100 \quad (7)$$

where:

$W_{in}$  = Mass feed rate of one principal organic hazardous constituent (POHC) in the hazardous waste fired to the incinerator or boiler or industrial furnace; and

$W_{out}$  = Mass emission rate of the same POHC present in stack gas prior to release to the atmosphere.

(2) **Designation of POHCs.** Principal organic hazardous constituents (POHCs) are those compounds for which compliance with the DRE requirements of this section shall be demonstrated in a trial burn in conformance with procedures prescribed in § 100.28 of these regulations. One or more POHCs shall be designated by the Director for each waste feed to be burned. POHCs shall be designated based on the degree of difficulty of destruction of the organic constituents in the waste and on their concentrations or mass in the waste feed considering the results of waste analyses submitted with Part B of the permit application. POHCs are most likely to be selected from among those compounds listed in Part 261, Appendix VIII of these regulations that are also present in the normal waste feed. However, if the applicant demonstrates to the Director's satisfaction that a compound not listed in Appendix VIII or not present in the normal waste feed is a suitable indicator of compliance with the DRE requirements of this section, that compound may be designated as a POHC. Such POHCs need not be toxic or organic compounds.

(3) **Dioxin-listed waste.** An incinerator or boiler or industrial furnace burning hazardous waste containing (or derived from) EPA Hazardous Wastes Nos. F020, F021, F022, F023, F026, or F027 must achieve a destruction and removal efficiency (DRE) of 99.9999% for each POHC designated (under paragraph (b)(2) of this section) in its permit. This performance must be demonstrated on POHCs that are more difficult to burn than tetra-, penta-, and hexachlorodibenzo-p-dioxins and dibenzofurans. DRE is determined for each POHC from the equation in paragraph (b)(1) of this section.

(c) **Carbon monoxide standard.**

(1) Except as provided in paragraph (d) of this section, the stack gas concentration of carbon monoxide (CO) from an incinerator, boiler, or industrial furnace burning hazardous waste cannot exceed 100 ppmv on an hourly rolling average basis (i.e., over any 60 minute period), continuously corrected to 7 percent oxygen, dry gas basis.

(2) CO and oxygen shall be continuously monitored in conformance with "Performance Specifications for Continuous Emission Monitoring of Carbon Monoxide and Oxygen for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste" in Appendix IX to § 264.348 of these regulations.

(3) Compliance with the 100 ppmv CO limit must be demonstrated during the trial burn (for new facilities or an interim status facility applying for a permit) or during the compliance test (for interim status facilities). To demonstrate compliance, the highest hourly rolling average CO level during any valid run of the trial burn or subsequent compliance test must not exceed 100 ppmv.

**(d) Alternative carbon monoxide standard.**

(1) The stack gas concentration of carbon monoxide (CO) from a boiler or industrial furnace burning hazardous waste may exceed the 100 ppmv limit provided that stack gas concentrations of hydrocarbons (HC) do not exceed 20 ppmv, except as provided by paragraph (h) of this section for certain industrial furnaces.

(2) HC limits must be established under this section on an hourly rolling average basis (i.e., over any 60 minute period), reported as propane, and continuously corrected to 7 percent oxygen, dry gas basis.

(3) HC shall be continuously monitored in conformance with "Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste" in Appendix IX to § 264.348 of these regulations. CO and oxygen shall be continuously monitored in conformance with paragraph (c)(2) of this section.

(4) The alternative CO standard is established based on CO data during the trial burn (for a new facility) and the compliance test (for an interim status facility). The alternative CO standard is the average over all valid runs of the highest hourly average CO level for each run. The CO limit is implemented on an hourly rolling average basis, and continuously corrected to 7 percent oxygen, dry gas basis.

**(e) Total hydrocarbon standard.**

(1) Except as provided for under paragraph (e)(4) of this section, the stack gas concentration of total unburned hydrocarbons (HC) from an incinerator, boiler or industrial furnace burning hazardous waste cannot exceed 20 ppmv on an hourly rolling average basis (i.e., over any 60 minute period), reported as propane, and continuously corrected to 7 percent oxygen, dry gas basis.

(2) HC shall be continuously monitored in conformance with "Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste" in Appendix IX to § 264.348 of these regulations.

(3) Compliance with the 20 ppmv HC limit must be demonstrated during the trial burn. To demonstrate compliance, the highest hourly rolling average HC level during any valid run of the trial burn or subsequent compliance test must not exceed 20 ppmv.

(4) A boiler or industrial furnace may emit HCs in excess of 20 ppmv on an hourly rolling average basis, reported as propane, and continuously corrected to 7 percent oxygen, dry gas basis at an alternative rate if approved by the Director in writing. In order to approve an alternative HC emission rate for a boiler or industrial furnace, the Director must find:

(i) That a HC emission rate of 20 ppmv is not appropriate for application to the boiler or industrial furnace system and;

(ii) That the proposed alternative HC emission rate will not allow the emission of hazardous constituents at levels that would represent a significant threat to public health or the environment.

**(f) Special requirements for furnaces.** Owners and operators of industrial furnaces (e.g., kilns, cupolas) that feed hazardous waste for a purpose other than solely as an ingredient (see § 265.140(a)(5)(ii)) at any location other than the end where products are normally discharged and where fuels are normally fired must comply with the hydrocarbon limits provided by paragraphs (d) or (h) of this section irrespective of whether stack gas CO concentrations meet the 100 ppmv limit of paragraph (c) of this section.

**(g) Controls for dioxins and furans.**

The performance standard for emissions of chlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/PCDF) is established through a two part test: (1) compliance with a maximum emissions limit and (2) an evaluation of risk on the measured emissions of these compounds.

(1) A maximum emission limit in the stack gas of 13 nanograms per dry standard cubic meter (ng/dscm), based on the sum of all tetra through octa dioxin and furan congeners, and a maximum emission limit in the stack gas of 0.17 ng/dscm of 2,3,7,8-TCDD toxicity equivalence (TEQ), calculated as specified in paragraph (e)(2) of this subpart. A lower limit will be set if the results of a MPHRA indicate that this limit does not meet acceptable performance standards described in paragraph (a) of this section.

(2) Owners and operators of all incinerators, boilers, or industrial furnaces must conduct MPHRA as required under § 100.28 to demonstrate that emissions of chlorinated dibenzo-p-dioxins and dibenzofurans do not result in an increased lifetime cancer risk to the hypothetical MEI exceeding the performance standards of this section. The results of this assessment will be factored into the cumulative risk from all carcinogenic compounds. The PCDD/PCDF risk assessment shall be performed using the following procedures:

(i) During the trial burn (for new facilities or an interim status facility applying for a permit) or compliance test (for interim status facilities), or during a periodic compliance test required under § 264.347(e), determine emission rates of the tetra-octa congeners of chlorinated dibenzo-p-dioxins and dibenzofurans (CDDs/CDFs) using Method 0023A, Sampling Method for Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans Emissions from Stationary Sources, EPA Publication SW-846, as incorporated by reference in § 260.11 of these regulations.

(ii) Estimate the 2,3,7,8-TCDD toxicity equivalence (TEQ) of the tetra-octa CDDs/CDFs congeners using "Procedures for Estimating the Toxicity Equivalence of Chlorinated Dibenzo-p-Dioxin and Dibenzofuran Congeners" in Appendix IX to § 264.348 of these regulations. Multiply the emission rates of CDD/CDF congeners with a toxicity equivalence greater than zero (see the procedure) by the calculated toxicity equivalence factor (TEF) to estimate the equivalent emission rate of 2,3,7,8-TCDD;

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(iii) Conduct dispersion modeling using methods recommended in Appendix W of 40 CFR Part 51 "Guideline on Air Quality Models" (Revised) (1986) and its supplements), the "Hazardous Waste Combustion Air Quality Screening Procedure", provided in Appendix IX to § 264.348 of these regulations, or in "Screening Procedures for Estimating Air Quality Impact of Stationary Sources", Revised (incorporated by reference in § 260.11) to predict the maximum annual average off-site ground level concentration of 2,3,7,8-TCDD equivalents determined under paragraph (g)(2) of this section. The maximum annual average concentration must be used when a person resides on-site; and

(iv) The ratio of the predicted maximum annual average ground level concentration of 2,3,7,8-TCDD equivalents to the risk-specific dose (RSD) divided by 10 for 2,3,7,8-TCDD provided in Table V to § 264.348 ( $2.2 \times 10^{-7}$ ) shall not exceed 1.0 using Equation (1) of this Subpart.

**(h) Monitoring CO and HC in the by-pass duct of a cement kiln.** Cement kilns may comply with the carbon monoxide and hydrocarbon limits provided by paragraphs (c), (d), and (e) of this section by monitoring in the by-pass duct provided that:

(1) Hazardous waste is fired only into the kiln and not at any location downstream from the kiln exit relative to the direction of gas flow; and

(2) The by-pass duct diverts a minimum of 10% of kiln off-gas into the duct.

**(i) Use of emissions test data to demonstrate compliance and establish operating limits.**

Compliance with the requirements of this section must be demonstrated simultaneously by emissions testing or during separate runs under identical operating conditions. Further, data to demonstrate compliance with the CO and HC limits of this section or to establish alternative CO or HC limits under this section must be obtained during the time that DRE testing and, as applicable, PCDD/PCDF testing under paragraph (g) of this section, and hazardous constituent emissions testing under paragraph (a) of this section is conducted.

**(j) The owner or operator must conduct emissions testing during the trial burn, or subsequent compliance test, to:**

(1) Identify the types and concentrations of organic compounds listed in Appendix VIII, Part 261 of these regulations, and products of incomplete combustion (PICs), that are emitted in the stack gas and conduct dispersion modeling to predict the maximum annual average ground level concentration of each organic compound. On-site ground level concentrations must be considered for this evaluation if a person resides on site.

(i) Sampling and analysis of organic emissions shall be conducted using procedures as described in Appendix IX to § 264.348 of these regulations, or alternate procedures approved by the Director.

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(ii) Dispersion modeling shall be conducted according to procedures referenced in paragraph (g)(2) of this section; and

(2) Demonstrate that maximum annual average ground level concentrations of the organic compounds identified in paragraph (i)(1) of this section do not exceed the emission standards in the permit. To estimate the health risk from chlorinated dibenzo-p-dioxins and dibenzofuran congeners, the procedures prescribed by paragraph (g)(2) of this section for the estimation of the 2,3,7,8-TCDD toxicity equivalence of the congeners will be used.

**(k) Enforcement.**

For the purposes of permit enforcement, compliance with the emission standards and operating requirements specified in the permit (under § 264.346) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 100.61 of these regulations.

**§ 264.343 Performance standards to control particulate matter.**

(a) An incinerator or boiler or industrial furnace burning hazardous waste may not emit particulate matter in excess of 23 milligrams per dry standard cubic meter (0.010 grains per dry standard cubic foot) after correction to a stack gas concentration of 7% oxygen, using procedures prescribed in 40 CFR Part 60, appendix A, methods 1 through 5, and Appendix IX to § 264.348 of these regulations.

(b) Reserved.

**(c) Oxygen correction.** (1) Measured pollutant levels must be corrected for the amount of oxygen in the stack gas according to the formula:

$$P_c = P_m \times 14 / (E - Y)$$

Where:

P<sub>c</sub> is the corrected concentration of the pollutant in the stack gas, P<sub>m</sub> is the measured concentration of the pollutant in the stack gas, E is the oxygen concentration on a dry basis in the combustion air fed to the device, and Y is the measured oxygen concentration on a dry basis in the stack.

(2) For devices that feed normal combustion air, E will equal 21 percent. For devices that feed oxygen-enriched air for combustion (that is, air with an oxygen concentration exceeding 21 percent), the value of E will be the concentration of oxygen in the enriched air.

(3) Compliance with all emission standards provided by this subpart must be based on correcting to 7 percent oxygen using this procedure.

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(d) For the purposes of permit enforcement, compliance with the particulate emission standard and the operating requirements specified in the permit (under § 264.346) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 100.61 of these regulations.

**§ 264.344 Performance standards to control emissions of metallic compounds.**

**(a) General.**

The owner or operator must comply with the metals standards provided by paragraphs (b), (c), (d), (e), or (f) of this section for each metal listed in paragraph (b) of this section that is present in the hazardous waste at detectable levels by using appropriate analytical procedures.

**(b) Tier I feed rate screening limits.**

Feed rate screening limits for metals are specified in Appendix I of this Subpart, as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. Criteria for facilities that are not eligible to comply with the screening limits are provided in paragraph (b)(7) of this section.

(1) **Noncarcinogenic metals.** The feed rates of antimony, barium, lead, mercury, thallium, silver, nickel and selenium in all feed streams, including hazardous waste and fuels, shall not exceed the screening limits specified in Appendix I of this Subpart.

(i) The feed rate screening limits for antimony, barium, mercury, thallium, silver, nickel and selenium are based on either:

(A) An hourly rolling average as defined in § 264.346(f)(1)(ii); or

(B) An instantaneous limit not to be exceeded at any time.

(ii) The feed rate screening limit for lead is based on one of the following:

(A) An hourly rolling average as defined in § 264.346(f)(1)(ii);

(B) An averaging period of 2 to 24 hours as defined in § 264.346(f)(2) with an instantaneous feed rate limit not to exceed 10 times the feed rate that would be allowed on an hourly rolling average basis; or

(C) An instantaneous limit not to be exceeded at any time.

(2) **Carcinogenic metals.**

(i) The feed rates of arsenic, cadmium, beryllium, and chromium in all feed streams, including hazardous waste, fuels, and industrial furnace feedstocks shall not exceed values derived from the screening limits specified in Appendix I of this Subpart. The feed rate of each of these metals is limited to a level such that the sum of the ratios of the actual feed rate to the feed rate screening limit, specified in Appendix I, divided by ten to achieve a 1 E-6 ALCR level, shall not exceed 1.0, as provided by the following equation:

$$\sum_{i=1}^n \frac{AFR_i}{FRSL_i/10} \leq 1.0 \quad (8)$$

where:

$n$  = number of carcinogenic metals

$AFR$  = actual feed rate to the device for metal "  $i$  "

$FRSL$  = feed rate screening limit provided by Appendix I of this Subpart for metal "  $i$  ", divided by 10 to achieve a 1 E-6 risk level for carcinogenic compounds.

(ii) The feed rate screening limits for the carcinogenic metals are based on either:

(A) An hourly rolling average; or

(B) An averaging period of 2 to 24 hours as defined in § 264.346(f)(2) with an instantaneous feed rate limit not to exceed 10 times the feed rate that would be allowed on an hourly rolling average basis.

(3) **TESH.**

(i) The terrain-adjusted effective stack height is determined according to the following equation:

$$TESH = Ha + HI - Tr \quad (9)$$

where:

$Ha$  = Actual physical stack height

$HI$  = Plume rise as determined from Appendix VI of this Subpart as a function of stack flow rate and stack gas exhaust temperature.

$Tr$  = Terrain rise within five kilometers of the stack.

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(ii) The stack height ( $H_a$ ) may not exceed good engineering practice (GEP) as specified in 40 CFR 51.100(ii).

(iii) If the TESH for a particular facility is not listed in the table in the appendices, the nearest lower TESH listed in the table shall be used. If the TESH is four meters or less, a value of four meters shall be used.

(4) **Terrain type.** The screening limits are a function of whether the facility is located in noncomplex or complex terrain. A device located where any part of the surrounding terrain within 5 kilometers of the stack equals or exceeds the elevation of the physical stack height ( $H_a$ ) is considered to be in complex terrain and the screening limits for complex terrain apply. Terrain measurements are to be made from U.S. Geological Survey 7.5-minute topographic maps of the area surrounding the facility.

(5) **Land use.** The screening limits are a function of whether the facility is located in an area where the land use is urban or rural. To determine whether land use in the vicinity of the facility is urban or rural, procedures provided in Appendices IX or X to § 264.348 of these regulations shall be used.

(6) **Multiple stacks.** Owners and operators of facilities with more than one on-site stack from an incinerator, boiler, industrial furnace, or other thermal treatment unit subject to controls of metals emissions under a Federal or State RCRA operating permit or interim status controls must comply with the screening limits for all such units assuming all hazardous waste is fed into the device with the worst-case stack based on dispersion characteristics. The worst-case stack is determined from the following equation as applied to each stack:

$$K = HVT \quad (10)$$

Where:

$K$  = a parameter accounting for relative influence of stack height and plume rise;

$H$  = physical stack height (meters);

$V$  = stack gas flow rate ( $m^3$ /second); and

$T$  = exhaust temperature (EK).

The stack with the lowest value of  $K$  is the worst-case stack.

(7) **Criteria for facilities not eligible for screening limits.** If any criteria below are met, the Tier I (and Tier II) screening limits do not apply. Owners and operators of such facilities must comply with either the Tier III standards provided by paragraph (d) of this section or with the adjusted Tier I feed rate screening limits provided by paragraph (e) of this section.

(i) The device is located in a narrow valley less than one kilometer wide;

(ii) The device has a stack taller than 20 meters and is located such that the terrain rises to the physical height within one kilometer of the facility;

(iii) The device has a stack taller than 20 meters and is located within five kilometers of a shoreline of a large body of water such as an ocean or large lake;

(iv) The physical stack height of any stack is less than 2.5 times the height of any building within five building heights or five projected building widths of the stack and the distance from the stack to the closest boundary is within five building heights or five projected building widths of the associated building; or

(v) The Director determines that standards based on site-specific dispersion modeling are necessary to evaluate protection of human health and the environment.

(8) **Implementation.** The feed rate of metals in each feedstream must be monitored to ensure that the feed rate screening limits are not exceeded.

(c) **Tier II emission rate screening limits.**

Emission rate screening limits are specified in Appendix I as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. Criteria for facilities that are not eligible to comply with the screening limits are provided in paragraph (b)(7) of this section.

(1) **Noncarcinogenic metals.** The emission rates of antimony, barium, lead, mercury, thallium, and silver shall not exceed the screening limits specified in Appendix I of this Subpart.

(2) **Carcinogenic metals.** The emission rates of arsenic, cadmium, beryllium, nickel and chromium shall not exceed values derived from the screening limits specified in Appendix I of this Subpart divided by ten to achieve a 1 E-6 ALCR level. The emission rate of each of these metals is limited to a level such that the sum of the ratios of the actual emission rate to the emission rate screening limit specified in Appendix I shall not exceed 1.0, as provided by the following equation:

$$\sum_{i=1}^n \frac{AER_{(i)}}{ERSL_{(i)}/10} \leq 1.0 \tag{11}$$

where:

$n$  = number of carcinogenic metals

$AER$  = actual emission rate for metal "  $i$  "

*ERSL* = emission rate screening limit provided by Appendix I of this Subpart for metal " *i* ", divided by 10 to achieve a 1 E-6 risk level for carcinogenic compounds.

(3) **Implementation.** The emission rate limits must be implemented by limiting feed rates of the individual metals to levels during the trial burn (for new facilities or an interim status facility applying for a permit) or the periodic compliance test. The feed rate averaging periods are the same as provided by paragraphs (b)(1)(i) and (ii) and (b)(2)(ii) of this section. The feed rate of metals in each feedstream must be monitored to ensure that the feed rate limits for the feedstreams specified under § 264.346 are not exceeded.

(4) **Definitions and limitations.** The definitions and limitations provided by paragraph (b) of this section for the following terms also apply to the Tier II emission rate screening limits provided by paragraph (c) of this section: terrain-adjusted effective stack height, good engineering practice stack height, terrain type, land use, and criteria for facilities not eligible to use the screening limits.

(5) **Multiple stacks.**

(i) Owners and operators of facilities with more than one onsite stack from an incinerator, boiler, industrial furnace, or other thermal treatment unit subject to controls on metals emissions under a State RCRA operating permit or interim status controls must comply with the emissions screening limits for any such stacks assuming all hazardous waste is fed into the device with the worst-case stack based on dispersion characteristics.

(ii) The worst-case stack is determined by procedures provided in paragraph (b)(6) of this section.

(iii) For each metal, the total emissions of the metal from those stacks shall not exceed the screening limit for the worst-case stack.

(d) **Tier III and Adjusted Tier I site-specific risk assessments**

(1) **General.** Conformance with the Tier III metals controls must be demonstrated by emissions testing to determine the emission rate for each metal. In addition, conformance with either the Tier III or Adjusted Tier I metals controls must be demonstrated by air dispersion modeling to predict the maximum annual average off-site ground level concentration for each metal, and a demonstration that acceptable ambient levels are not exceeded.

(2) **Acceptable ambient levels.** Appendices IV and V of this Subpart list the acceptable ambient levels for purposes of this section. Reference air concentrations (RACs) are listed for the noncarcinogenic metals and  $10^{-5}$  risk-specific doses (RSDs) are listed for the carcinogenic metals. The RSD for a metal, divided by ten to achieve a 1 E-6 ALCR level, is the acceptable ambient level for that metal provided that only one of the four carcinogenic metals is emitted. If more than one carcinogenic metal is emitted, the acceptable ambient level for the carcinogenic metals is a fraction of the RSD as described in paragraph (d)(3) of this section.

(3) **Carcinogenic metals.**

(i) For the carcinogenic metals, arsenic, cadmium, beryllium, nickel and chromium, the sum of the ratios of the predicted maximum annual average off-site ground level concentrations (except that on-site concentrations must be considered if a person resides on site) to the risk-specific dose (RSD) divided by ten to achieve a 1 E-6 ALCR level, for all carcinogenic metals emitted shall not exceed 1.0 as determined by the following equation:

$$ALCR_j = \sum_{i=1}^n \frac{\text{Predicted (Or Measured) Ambient Concentration}_{(i)}}{\text{Risk - Specific Dose}_{(i)} / 10} \quad (12)$$

n = number of carcinogenic compounds being evaluated in the risk assessment;

j = type of carcinogenic compounds (ie., metals, PCDD/F, and organic PICs);

Predicted (or measured) Ambient Concentration of compound "i" at the MEI using dispersion modeling;

Risk-Specific Dose (RSD) of compound "i" from Table V, (or Agency-accepted health based standard)

(ii) Results of predicted maximum annual average off-site ground level concentrations for carcinogenic metals shall be summed with results for other carcinogenic compounds calculated in § 264.342 to produce an estimate of the overall increased lifetime cancer risk to the hypothetical MEI.

(4) **Noncarcinogenic metals.** For the noncarcinogenic metals, the predicted maximum annual average off-site ground level concentration for each metal shall not exceed the performance standards of this Subpart.

(5) **Multiple stacks.** Owners and operators of facilities with more than one on-site stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on metals emissions under a RCRA operating permit or interim status controls must conduct emissions testing (except that facilities complying with Adjusted Tier I controls need not conduct emissions testing) and dispersion modeling to demonstrate that the aggregate emissions from all such on-site stacks do not result in an exceedance of the acceptable ambient levels.

(6) **Implementation.** Under Tier III, the metals controls must be implemented by limiting feed rates of the individual metals to levels during the trial burn (for new facilities or an interim status facility applying for a permit) or the periodic compliance test. The feed rate averaging periods are the same as provided by paragraphs (b)(1)(i) and (ii) and (b)(2)(ii) of this section. The feed rate of metals in each feedstream must be monitored to ensure that the feed rate limits for the feedstreams specified under § 264.346 are not exceeded.

**(e) Adjusted Tier I feed rate screening limits.**

The owner or operator may adjust the feed rate screening limits provided by Appendix I of this Subpart to account for site-specific dispersion modeling. Under this approach, the adjusted feed rate screening limit for a metal is determined by back-calculating from the acceptable ambient levels provided by Appendices IV and V of this Subpart using dispersion modeling to determine the maximum allowable emission rate. This emission rate becomes the adjusted Tier I feed rate screening limit. The feed rate screening limits for carcinogenic metals are implemented as prescribed in paragraph (b)(2) of this section.

**(f) Alternative implementation approaches.**

(1) The Director may approve on a case-by-case basis approaches to implement the Tier II or Tier III metals emission limits provided by paragraphs (c) or (d) of this section alternative to monitoring the feed rate of metals in each feedstream.

(2) The emission limits provided by paragraph (d) of this section must be determined as follows:

(i) For each noncarcinogenic metal, by back-calculating from the RAC provided in Appendix IV of this Subpart to determine the allowable emission rate for each metal using the dilution factor for the maximum annual average ground level concentration predicted by dispersion modeling in conformance with paragraph (h) of this section; and

(ii) For each carcinogenic metal by:

(A) Back-calculating from the RSD (divided by ten to achieve a 1 E-6 ALCR level) provided in Appendix V of this Subpart to determine the allowable emission rate for each metal if that metal were the only carcinogenic metal emitted using the dilution factor for the maximum annual average ground level concentration predicted by dispersion modeling in conformance with paragraph (h) of this section; and

(B) If more than one carcinogenic metal is emitted, selecting an emission limit for each carcinogenic metal not to exceed the emission rate determined by paragraph (f)(2)(ii)(A) of this section such that the sum for all carcinogenic compounds metals of the ratios of the selected emission limit to the emission rate determined by that paragraph does not exceed 1.0, using Equation 1 of this section.

**(g) Emission testing.**

(1) **General.** Emission testing for metals shall be conducted using the Multiple Metals Train as described in Method 0060, Determinations of Metals in Stack Emissions, EPA Publication SW-846, as incorporated by reference in § 260.11 of these regulations.

(2) **Hexavalent chromium.** Emissions of chromium are assumed to be hexavalent chromium unless the owner or operator conducts emissions testing to determine hexavalent chromium emissions using procedures prescribed in Method 0061, Determination of Hexavalent

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Chromium Emissions from Stationary Sources, EPA Publication SW-846, as incorporated by reference in § 260.11 of these regulations.

**(h) Dispersion modeling.**

Dispersion modeling required under this section shall be conducted according to methods recommended in appendix W of 40 CFR Part 51 ("Guideline on Air Quality Models (Revised)" (1986) and its supplements), the "Hazardous Waste Combustion Air Quality Screening Procedure" provided in Appendix IX to § 264.348 of these regulations, or in "Screening Procedures for Estimating Air Quality Impact of Stationary Sources, Revised" (incorporated by reference in § 260.11) to predict the maximum annual average off-site ground level concentration. However, on-site concentrations must be considered when a person resides on-site.

**(i) Enforcement.** For the purposes of permit enforcement, compliance with the metals emission standards and operating requirements specified in the facility's operating permit (under § 264.346) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 100.61 of these regulations.

**§ 264.345 Standards to control hydrogen chloride (HCl) and chlorine gas (Cl<sub>2</sub>) emissions.**

**(a) General.**

The owner or operator must comply with the hydrogen chloride (HCl) and chlorine (Cl<sub>2</sub>) controls provided by paragraphs (b), (c), or (e) of this section.

**(b) Screening limits.**

(1) **Tier I feed rate screening limits.** Feed rate screening limits are specified for total chlorine in Appendix II of this Subpart as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. The feed rate of total chlorine and chloride, both organic and inorganic, in all feed streams, including hazardous waste, fuels, and industrial furnace feedstocks shall not exceed the levels specified.

(2) **Tier II emission rate screening limits.** Emission rate screening limits for HCl and Cl<sub>2</sub> are specified in Appendix III of this Subpart as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. The stack emission rates of HCl and Cl<sub>2</sub> shall not exceed the levels specified.

(3) **Definitions and limitations.** The definitions and limitations provided by § 264.344(b) for the following terms also apply to the screening limits provided by this paragraph: terrain-adjusted effective stack height, good engineering practice stack height, terrain type, land use, and criteria for facilities not eligible to use the screening limits.

(4) **Multiple stacks.** Owners and operators of facilities with more than one on-site stack from an incinerator, boiler, industrial furnace, or other thermal treatment unit subject to controls on HCl or Cl<sub>2</sub> emissions under a State RCRA operating permit or interim status controls must comply with the Tier I and Tier II screening limits for those stacks assuming all hazardous waste is fed into the device with the worst-case stack based on dispersion characteristics.

(i) The worst-case stack is determined by procedures provided in § 264.344(b)(6).

(ii) Under Tier I, the total feed rate of chlorine and chloride to all subject devices shall not exceed the screening limit for the worst-case stack.

(iii) Under Tier II, the total emissions of HCl and Cl<sub>2</sub> from all subject stacks shall not exceed the screening limit for the worst-case stack.

**(c) Tier III site-specific risk assessments.**

(1) **General.** Conformance with the Tier III controls must be demonstrated by emissions testing to determine the emission rate for HCl and Cl<sub>2</sub>, air dispersion modeling to predict the maximum annual average off-site ground level concentration for each compound, and a demonstration that acceptable ambient levels are not exceeded.

(2) **Acceptable ambient levels.** Appendix IV of this Subpart lists the reference air concentrations (RACs) for HCl (7 micrograms per cubic meter) and Cl<sub>2</sub> (0.4 micrograms per cubic meter).

(3) **Multiple stacks.** Owners and operators of facilities with more than one on-site stack from an incinerator, boiler, industrial furnace, or other thermal treatment unit subject to controls on HCl or Cl<sub>2</sub> emissions under a State RCRA operating permit or interim status controls must conduct emissions testing and dispersion modeling to demonstrate that the aggregate emissions from all such on-site stacks do not result in an exceedance of the acceptable ambient levels for HCl and Cl<sub>2</sub>.

(d) **Averaging periods.**

The HCl and Cl<sub>2</sub> controls are implemented by limiting the feed rate of total chlorine and chloride in all feedstreams, including hazardous waste, fuels, and industrial furnace feedstocks. Under Tier I, the feed rate of total chlorine and chloride is limited to the Tier I Screening Limits. Under Tier II and Tier III, the feed rate of total chlorine and chloride is limited to the feed rates during the trial burn (for new facilities or an interim status facility applying for a permit) or the periodic compliance test. The feed rate limits are based on either:

- (1) An hourly rolling average as defined in § 264.346(f); or
- (2) An instantaneous basis not to be exceeded at any time.

(e) **Adjusted Tier I feed rate screening limits.**

The owner or operator may adjust the feed rate screening limit provided by Appendix II of this Subpart to account for site-specific dispersion modeling. Under this approach, the adjusted feed rate screening limit is determined by back-calculating from the acceptable ambient level for Cl<sub>2</sub> provided by Appendix IV of this Subpart using dispersion modeling to determine the maximum allowable emission rate. This emission rate becomes the adjusted Tier I feed rate screening limit.

(f) **Emissions testing.**

Emissions testing for HCl and Cl<sub>2</sub> shall be conducted using the procedures described in Methods 0050 or 0051, EPA Publication SW-846, as incorporated by reference in § 260.11 of these regulations.

(g) **Dispersion modeling.**

Dispersion modeling shall be conducted according to the provisions of § 264.344(h).

(h) **Enforcement.**

For the purposes of permit enforcement, compliance with the chlorine gas and hydrogen chloride gas standards and the operating requirements specified in the permit (under § 264.346) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section will be "information" justifying modification or revocation and re-issuance of a permit under § 100.61 of these regulations.

**§ 264.346 Permit standards for burners.**

**(a) General.**

An incinerator, boiler, or industrial furnace burning hazardous waste must be operated in accordance with the operating requirements of this section and the emission standards of §§ 264.342 through 264.345 and as specified in the permit at all times where there is hazardous waste in the unit.

**(b) Permits.**

- (1) The owner or operator of a hazardous waste incinerator, boiler, or industrial furnace may burn only wastes specified in the facility's permit and only under operating conditions specified for those wastes under this section, except under exemptions created by § 264.340, and § 261.4(e) and (f).
- (2) Other hazardous wastes may be burned only after operating conditions have been specified in a new permit or a permit modification as applicable. Operating requirements for new wastes may be based on either trial burn results or alternative data included with Part B of a permit application under § 100.41(b)(5) of these regulations.
- (3) A permit for a new hazardous waste incinerator, boiler, or industrial furnace must establish appropriate conditions for each of the applicable requirements of this Subpart, including but not limited to allowable waste feeds and operating conditions necessary to meet the requirements of this section, in order to comply with the following standards:
  - (i) For the period beginning with initial introduction of hazardous waste to the incinerator and ending with initiation of the trial burn, and only for the minimum time required to establish operating conditions required in paragraph (c)(2) of this section, not to exceed a duration of 720 hours operating time for treatment of hazardous waste, the operating requirements must be those most likely to ensure compliance with the performance standards of § 264.342, § 264.343, § 264.344, and § 264.345, based on the Director's engineering judgement. The Department may extend the duration of this period once for up to 720 additional hours when good cause for the extension is demonstrated by the applicant.
  - (ii) For the duration of the trial burn, the operating requirements must be sufficient to demonstrate compliance with the performance standards of § 264.342, § 264.343, § 264.344, and § 264.345, and must be in accordance with the approved trial burn plan;
  - (iii) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, submission of the trial burn results by the applicant, and review of the trial burn results and modification of the facility permit by the Department, the operating requirements must be those most likely to ensure compliance with the performance standards of § 264.342, § 264.343, § 264.344, and § 264.345, based on the Director's engineering judgement.

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(iv) For the remaining duration of the permit, the operating requirements must be those demonstrated, in a trial burn or by alternative data specified in § 100.41(b)(5)(iii) of these regulations, as sufficient to ensure compliance with the performance standards of § 264.342, § 264.343, § 264.344, and § 264.345.

(c) **Operating Requirements:**

(1) **Hazardous Constituents Risk Based Standard.** The Director may establish any permit condition that is necessary to ensure that stack emissions from the facility do not exceed the risk based performance standard of § 264.342(a) or any other performance standard of this Subpart, as necessary to protect human health and the environment. Such permit conditions may include but are not limited to: requiring a 99.999% or 99.9999% DRE for POHCs, requiring feed rate limitations for particular compounds, or requiring mass emissions limits for specific compounds.

(2) **Organic emission standards.**

(i) **DRE standard.** Operating conditions will be specified either on a case-by-case basis for each hazardous waste burned as those demonstrated in a trial burn or by alternative data as specified in § 100.41(b)(5) to be sufficient to comply with the destruction and removal efficiency (DRE) performance standard of § 264.342(a). Each set of operating requirements will specify the composition of the hazardous waste (including acceptable variations in the physical and chemical properties of the hazardous waste which will not affect compliance with the DRE performance standard) to which the operating requirements apply. For each such hazardous waste, the permit will specify acceptable operating limits including, but not limited to, the following conditions as appropriate:

(A) Feed rate of hazardous waste and other fuels measured and specified as prescribed in paragraph (f) of this section;

(B) Minimum and maximum device production rate when producing normal product expressed in appropriate units, measured and specified as prescribed in paragraph (6) of this section;

(C) Appropriate controls of the hazardous waste firing system;

(D) Allowable variation in incinerator, boiler and industrial furnace system design or operating procedures;

(E) Minimum combustion gas temperature measured at a location indicative of combustion chamber temperature, measured and specified as prescribed in paragraph (f) of this section;

(F) An appropriate indicator of combustion gas velocity, measured and specified as prescribed in paragraph (f) of this section, unless documentation is provided under § 100.28 demonstrating adequate combustion gas residence time; and

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(G) Such other operating requirements as are necessary to ensure that the DRE performance standard of § 264.342(b) is met.

(ii) **Carbon monoxide and hydrocarbon standards.** The permit must incorporate a carbon monoxide (CO) limit and a hydrocarbon (HC) limit as provided by paragraphs (c) and (d) of § 264.342. The permit limits will be specified as follows:

(A) When complying with the CO standard of § 264.342(c)(1), the permit limit is 100 ppmv;

(B) When complying with the alternative CO standard under § 264.342(d), the permit limit for CO is based on the trial burn and is established as the average over all valid runs of the highest hourly rolling average CO level of each run, and the permit limit for HC is 20 ppmv (as defined in § 264.342(d)(1), except as provided in § 264.342(h).

(C) When complying with the alternative HC limit for industrial furnaces under § 264.342(e), the permit limit for HC and CO is the baseline level when hazardous waste is not burned as specified by that paragraph.

(iii) **Start-up and shut-down.** During start-up and shut-down of the incinerator, boiler, or industrial furnace, hazardous waste (except waste fed solely as an ingredient under the Tier I (or adjusted Tier I) feed rate screening limits for metals and chloride/chlorine) must not be fed into the device unless the device is operating within the conditions of operation specified in the permit.

**(3) Requirements to ensure conformance with the particulate standard.**

(i) The permit shall specify the following operating requirements to ensure conformance with the particulate standard specified in § 264.343:

(A) Total ash feed rate to the device from hazardous waste, other fuels, and industrial furnace feedstocks, measured and specified as prescribed in paragraph (c)(6) of this section;

(B) Maximum device production rate when producing normal product expressed in appropriate units, and measured and specified as prescribed in paragraph (c)(6) of this section;

(C) Appropriate controls on operation and maintenance of the hazardous waste firing system and any air pollution control system;

(D) Allowable variation in incinerator, boiler, or industrial furnace system design including any air pollution control system or operating procedures; and

(E) Such other operating requirements as are necessary to ensure that the particulate standard in § 264.343 is met.

(ii) Reserved

(iii) Reserved

**(4) Requirements to ensure conformance with the metals emissions standard.**

(i) For conformance with the Tier I (or adjusted Tier I) metals feed rate screening limits of paragraphs (b) or (e) of § 264.344, the permit shall specify the following operating requirements:

(A) Total feed rate of each metal in hazardous waste, other fuels, and industrial furnace feedstocks measured and specified under provisions of paragraph (c)(6) of this section;

(B) Total feed rate of hazardous waste measured and specified as prescribed in paragraph (c)(6) of this section;

(C) A sampling and metals analysis program for the hazardous waste, other fuels, and industrial furnace feedstocks;

(ii) For conformance with the Tier II metals emission rate screening limits under § 264.344(c) and the Tier III metals controls under § 264.344(d), the permit shall specify the following operating requirements:

(A) Maximum emission rate for each metal specified as the average emission rate during the trial burn;

(B) Feed rate of total hazardous waste and pumpable hazardous waste, each measured and specified as prescribed in paragraph (c)(6) of this section;

(C) Feed rate of each metal in the following feedstreams, measured and specified as prescribed in paragraphs (c)(6) of this section:

(1) Total feed streams;

(2) Total hazardous waste feed; and

(3) Total pumpable hazardous waste feed;

(D) Total feed rate of chlorine and chloride in total feed streams measured and specified as prescribed in paragraph (c)(6) of this section;

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(E) Maximum combustion gas temperature measured at a location indicative of combustion chamber temperature, and measured and specified as prescribed in paragraph (c)(6) of this section;

(F) Maximum flue gas temperature at the inlet to the particulate matter air pollution control system measured and specified as prescribed in paragraph (c)(6) of this section;

(G) Maximum device production rate when producing normal product expressed in appropriate units and measured and specified as prescribed in paragraph (c)(6) of this section;

(H) Appropriate controls on operation and maintenance of the hazardous waste firing system and any air pollution control system;

(I) Allowable variation in incinerator, boiler, or industrial furnace system design including any air pollution control system or operating procedures; and

(J) Such other operating requirements as are necessary to ensure that the metals standards under § 264.344 are met.

(iii) For conformance with an alternative implementation approach approved by the Director under § 264.344(f), the permit will specify the following operating requirements:

(A) Maximum emission rate for each metal specified as the average emission rate during the trial burn;

(B) Feed rate of total hazardous waste and pumpable hazardous waste, each measured and specified as prescribed in paragraph (c)(6) of this section;

(C) Feed rate of each metal in the following feedstreams, measured and specified as prescribed in paragraph (c)(6) of this section:

(1) Total hazardous waste feed; and

(2) Total pumpable hazardous waste feed;

(D) Total feed rate of chlorine and chloride in total feedstreams measured and specified as prescribed in paragraph (c)(6) of this section;

(E) Maximum combustion gas temperature measured at a location indicative of combustion chamber temperature, and measured and specified as prescribed in paragraph (c)(6) of this section;

(F) Maximum flue gas temperature at the inlet to the particulate matter air pollution control system measured and specified as prescribed in paragraph (c)(6) of this section;

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(G) Maximum device production rate when producing normal product expressed in appropriate units and measured and specified as prescribed in paragraph (c)(6) of this section;

(H) Appropriate controls on operation and maintenance of the hazardous waste firing system and any air pollution control system;

(I) Allowable variation in incinerator, boiler, or industrial furnace system design including any air pollution control system or operating procedures; and

(J) Such other operating requirements as are necessary to ensure that the metals standards under § 264.344(c) or (d) are met.

**(5) Requirements to ensure conformance with the hydrogen chloride and chlorine gas standards.**

(i) For conformance with the Tier I total chlorine and chloride feed rate screening limits of § 264.345(b)(1), the permit will specify the following operating requirements:

(A) Feed rate of total chlorine and chloride in hazardous waste, other fuels, and industrial furnace feedstocks, measured and specified as prescribed in paragraph (c)(6) of this section;

(B) Feed rate of total hazardous waste measured and specified as prescribed in paragraph (c)(6) of this section;

(C) A sampling and analysis program for total chlorine and chloride for the hazardous waste, other fuels, and industrial furnace feedstocks;

(ii) For conformance with the Tier II HCl and Cl<sub>2</sub> emission rate screening limits under § 264.345(b)(2) and the Tier III HCl and Cl<sub>2</sub> controls under § 264.345(c), the permit will specify the following operating requirements:

(A) Maximum emission rate for HCl and for Cl<sub>2</sub> specified as the average emission rate during the trial burn;

(B) Feed rate of total hazardous waste measured and specified as prescribed in paragraph (c)(6) of this section;

(C) Total feed rate of chlorine and chloride in total feed streams, measured and specified as prescribed in paragraph (c)(6) of this section;

(D) Maximum device production rate when producing normal product expressed in appropriate units and measured and specified as prescribed in paragraph (c)(6) of this section;

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(E) Appropriate controls on operation and maintenance of the hazardous waste firing system and any air pollution control system;

(F) Allowable variation in incinerator, boiler, or industrial furnace system design including any air pollution control system or operating procedures; and

(G) Such other operating requirements as are necessary to ensure that the HCl and Cl<sub>2</sub> standards under § 264.345 are met.

**(6) Measuring parameters and establishing limits based on trial burn data.**

(i) **General requirements.** As specified in paragraphs (c)(3) through (c)(5) of this section, each operating parameter shall be measured, and permit limits on the parameter shall be established, according to either of the following procedures:

(A) **Instantaneous limits.** A parameter may be measured and recorded on an instantaneous basis (i.e., the value that occurs at any time) and the permit limit specified as the time-weighted average during all valid runs of the trial burn; or

(B) **Hourly rolling average.**

(1) The limit for a parameter may be established and continuously monitored on an hourly rolling average basis defined as follows:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(ii) An hourly rolling average is the arithmetic mean of the 60 most recent 1-minute average values recorded by the continuous monitoring system.

(2) The permit limit for the parameter shall be established based on trial burn data as the average over all valid test runs of the highest hourly rolling average value for each run.

(ii) **Rolling average limits for carcinogenic metals and lead.** Feed rate limits for the carcinogenic metals (i.e., arsenic, beryllium, cadmium, nickel and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (c)(6) of this section or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an average period from 2 to 24 hours:

(A) The feed rate of each metal shall be limited at any time to ten times the feed rate that would be allowed on an hourly rolling average basis;

(B) The continuous monitor shall meet the following specifications:

(1) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(2) The rolling average for the selected averaging period is defined as the arithmetic mean of one hour block averages for the averaging period. A one hour block average is the arithmetic mean of the one minute averages recorded during the 60-minute period beginning at one minute after the beginning of preceding clock hour; and

(C) The permit limit for the feed rate of each metal shall be established based on trial burn data as the average over all valid test runs of the highest hourly rolling average feed rate for each run.

(iii) **Feed rate limits for metals, total chlorine and chloride, and ash.** Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored based upon the concentration of the substance (i.e., metals, chloride/chlorine, and ash) in each feedstream and the flow rate of the feedstream. To monitor the feed rate of these substances, the flow rate of each feedstream must be monitored under the continuous monitoring requirements of paragraphs (c)(6)(i) and (ii) of this section.

(iv) **Conduct of trial burn testing.**

(A) If compliance with all applicable emissions standards of §§ 264.342 through 264.345 is not demonstrated simultaneously during a set of test runs, the operating conditions of additional test runs required to demonstrate compliance with remaining emissions standards must be substantially equivalent to the original operating conditions.

(B) Prior to obtaining test data for purposes of demonstrating compliance with the emissions standards of §§ 264.342 through 264.345 or establishing limits on operating parameters under this section, the facility must operate under trial burn conditions for a sufficient period to reach steady-state operations. The Director may determine, however, that industrial furnaces that recycle collected particulate matter back into the furnace and that comply with an alternative implementation approach for metals under § 264.344(f) need not reach steady state conditions with respect to the flow of metals in the system prior to beginning compliance testing for metals emissions.

(C) Trial burn data on the level of an operating parameter for which a limit must be established in the permit must be obtained during emissions sampling for the pollutant(s) (i.e., metals, PM, HCl/Cl<sub>2</sub>, organic compounds) for which the parameter must be established as specified by this section.

(d) **General requirements.**

(1) **Fugitive emissions.** Fugitive emissions must be controlled by:

- (i) Keeping the combustion zone totally sealed against fugitive emissions; or
- (ii) Maintaining the combustion zone pressure lower than atmospheric pressure; or
- (iii) An alternate means of control demonstrated (with Part B of the permit application) to provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure.

(2) **Automatic waste feed cutoff.** An incinerator, boiler or industrial furnace must be operated with a functioning system that automatically cuts off the hazardous waste feed when operating conditions deviate from those established under this section. The Director will specify a limit for the number of cutoffs per an operating period on a case-by-case basis when necessary to ensure protection of human health or the environment, and/or to ensure proper operation and/or functioning of the incineration facility. In addition:

- (i) The permit limit for (the indicator of) minimum combustion chamber temperature must be maintained while hazardous waste or hazardous waste residues remain in the combustion chamber,
- (ii) Exhaust gases must be ducted to the air pollution control system operated in accordance with the permit requirements while hazardous waste or hazardous waste residues remain in the combustion chamber; and
- (iii) Operating parameters for which permit limits are established must continue to be monitored during the cutoff, and the hazardous waste feed shall not be restarted until the levels of those parameters comply with the permit limits. For parameters that may be monitored on an instantaneous basis, the Director will establish a minimum period of time after a waste feed cutoff during which the parameter must not exceed the permit limit before the hazardous waste feed may be restarted.

(3) **Changes in operating conditions.** An incinerator, boiler or industrial furnace must cease burning hazardous waste when changes in combustion properties, or feed rates of the hazardous waste, other fuels, or industrial furnace feedstocks, or changes in the incinerator, boiler or industrial furnace design or operating conditions are expected or proposed which deviate from the limits as specified in the permit.

(e) **Monitoring and Inspections.**

(1) The owner or operator must monitor and record the following, at a minimum, while burning hazardous waste:

- (i) If specified by the permit, feed rates and composition of hazardous waste, other fuels, industrial furnace feedstocks, and feed rates of ash, metals, and total chlorine and chloride;

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(ii) If specified by the permit, carbon monoxide (CO), hydrocarbons (HC), and oxygen (O<sub>2</sub>), HCl<sub>gas</sub>, and opacity on a continuous basis at a common point in the incinerator, boiler or industrial furnace downstream of the combustion zone and prior to release of stack gases to the atmosphere in accordance with operating requirements specified in paragraph (b)(2) of this section. CO, HC, and oxygen monitors must be installed, operated, and maintained in accordance with methods specified in Appendix IX to § 264.348 of these regulations. Additional emissions monitors may be required in the facility's permit in accordance with § 264.346(k), based on the composition of the waste being combusted and the availability of monitoring equipment.

(iii) Upon the request of the Director, sampling and analysis of the hazardous waste (and other fuels and industrial feedstocks as appropriate), residues, and exhaust emissions must be conducted to verify that the operating requirements established in the permit achieve the applicable performance standards of §§ 264.342, 264.343, 264.344, and 264.345.

(2) All monitors shall record data in units corresponding to the permit limit unless otherwise specified in the permit.

(3) The incinerator, boiler or industrial furnace and associated equipment (pumps, valves, pipes, fuel storage tanks, etc.) must be subjected to thorough visual inspection when it contains hazardous waste, at least daily for leaks, spills, fugitive emissions, and signs of tampering.

(4) The automatic hazardous waste feed cutoff system and associated alarms must be tested at least once every 7 days when hazardous waste is burned to verify operability, unless the applicant demonstrates to the Director that weekly inspections will unduly restrict or upset operations and that less frequent inspections will be adequate. At a minimum, operational testing must be conducted at least once every 30 days.

(5) This monitoring and inspection data must be recorded and the records must be placed in the operating record required by § 264.73 of these regulations and maintained in the operating record for five years.

(f) **Standards for direct transfer.** If hazardous waste is directly transferred from a transport vehicle to an incinerator, boiler, or industrial furnace without the use of a storage unit, the owner and operator must comply with the requirements of this section.

(1) **Applicability.** The regulations in this section apply to owners and operators of incinerators, boilers, and industrial furnaces subject to §§ 264.346 or 265.140 if hazardous waste is directly transferred from a transport vehicle to an incinerator, boiler or industrial furnace without the use of a storage unit.

(2) **Definitions.** (i) When used in this section, the following terms have the meanings given below:

**Direct transfer equipment** means any device (including but not limited to, such devices as piping, fittings, flanges, valves, and pumps) that is used to distribute, meter, or control the flow of hazardous waste between a container (i.e., transport vehicle) and an incinerator, boiler or industrial furnace.

**Container** means any portable device in which hazardous waste is transported, stored, treated, or otherwise handled, and includes transport vehicles that are containers themselves (e.g., tank trucks, tanker-trailers, and rail tank cars), and containers placed on or in a transport vehicle.

(ii) This section references several requirements provided in Subparts I and J of Parts 264 and 265. For purposes of this section, the term “tank systems” in those referenced requirements means direct transfer equipment as defined in paragraph (f)(2)(i) of this section.

(3) **General operating requirements.** (i) No direct transfer of a pumpable hazardous waste shall be conducted from an open-top container to an incinerator, boiler or industrial furnace.

(ii) Direct transfer equipment used for pumpable hazardous waste shall always be closed, except when necessary to add or remove the waste, and shall not be opened, handled, or stored in a manner that may cause any rupture or leak.

(iii) The direct transfer of hazardous waste to an incinerator, boiler or industrial furnace shall be conducted so that it does not:

(A) Generate extreme heat or pressure, fire, explosion, or violent reaction;

(B) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;

(C) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(D) Damage the structural integrity of the container or direct transfer equipment containing the waste;

(E) Adversely affect the capability of the incinerator, boiler or industrial furnace to meet the standards provided by §§ 264.342 through 264.345; or

(F) Threaten human health or the environment.

(iv) Hazardous waste shall not be placed in direct transfer equipment, if it could cause the equipment or its secondary containment system to rupture, leak, corrode, or otherwise fail.

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(v) The owner or operator of the facility shall use appropriate controls and practices to prevent spills and overflows from the direct transfer equipment or its secondary containment systems. These include at a minimum:

(A) Spill prevention controls (e.g., check valves, dry discount couplings); and

(B) Automatic waste feed cutoff to use if a leak or spill occurs from the direct transfer equipment.

(4) **Areas where direct transfer vehicles (containers) are located.** Applying the definition of container under this section, owners and operators must comply with the following requirements:

(i) The containment requirements of § 264.175 of these regulations;

(ii) The use and management requirements of Subpart I, Part 265 of these regulations, except for §§ 265.170 and 265.174, and except that in lieu of the special requirements of § 265.176 for ignitable or reactive waste, the owner or operator may comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjacent property line that can be built upon as required in Tables 2-1 through 2-6 of the National Fire Protection Association's (NFPA) "Flammable and Combustible Liquids Code," (1977 or 1981), (incorporated by reference, see § 260.11). The owner or operator must obtain and keep on file at the facility a written certification by the local Fire Marshall that the installation meets the subject NFPA codes; and

(iii) The closure requirements of § 264.178 of these regulations.

(5) **Direct transfer equipment.** Direct transfer equipment must meet the following requirements:

(i) **Secondary containment.** Owners and operators shall comply with the secondary containment requirements of § 265.193 of these regulations, except for paragraphs 265.193(a), (d), (e), and (i) as follows:

(A) For all new direct transfer equipment, prior to their being put into service; and

(B) For existing direct transfer equipment within 2 years after August 21, 1991 (*or within two years of the effective date of the regulations which first require the owner or operator to comply with the standards set forth in Part 265*).

(ii) **Requirements prior to meeting secondary containment requirements.** (A) For existing direct transfer equipment that does not have secondary containment, the owner or operator shall determine whether the equipment is leaking or is unfit for use. The owner or operator shall obtain and keep on file at the facility a written assessment reviewed and certified by a qualified, registered professional engineer in accordance with § 100.12(d) of these regulations that attests to the equipment's integrity by August 21,

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1992 (or within one year of the effective date of the regulations which first require the owner or operator to comply with the standards set forth in Part 265).

(B) This assessment shall determine whether the direct transfer equipment is adequately designed and has sufficient structural strength and compatibility with the waste(s) to be transferred to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment shall consider the following:

- (1) Design standard(s), if available, according to which the direct transfer equipment was constructed;
- (2) Hazardous characteristics of the waste(s) that have been or will be handled;
- (3) Existing corrosion protection measures;
- (4) Documented age of the equipment, if available, (otherwise, an estimate of the age); and
- (5) Results of a leak test or other integrity examination such that the effects of temperature variations, vapor pockets, cracks, leaks, corrosion, and erosion are accounted for.

(C) If, as a result of the assessment specified above, the direct transfer equipment is found to be leaking or unfit for use, the owner or operator shall comply with the requirements of §§ 265.196 (a) and (b) of these regulations.

(iii) **Inspections and recordkeeping.** (A) The owner or operator must inspect at least once each operating hour when hazardous waste is being transferred from the transport vehicle (container) to the incinerator, boiler or industrial furnace:

- (1) Overfill/spill control equipment (e.g., waste-feed cutoff systems, bypass systems, and drainage systems) to ensure that it is in good working order;
- (2) The above ground portions of the direct transfer equipment to detect corrosion, erosion, or releases of waste (e.g., wet spots, dead vegetation); and
- (3) Data gathered from monitoring equipment and leak-detection equipment, (e.g., pressure and temperature gauges) to ensure that the direct transfer equipment is being operated according to its design.

(B) The owner or operator must inspect cathodic protection systems, if used, to ensure that they are functioning properly according to the schedule provided by § 265.195(b) of these regulations:

(C) Records of inspections made under this paragraph shall be maintained in the operating record at the facility, and available for inspection for at least 3 years from the date of the inspection.

(iv) **Design and installation of new ancillary equipment.** Owners and operators must comply with the requirements of § 265.192 of these regulations.

(v) **Response to leaks or spills.** Owners and operators must comply with the requirements of § 265.196 of these regulations.

(vi) **Closure.** Owners and operators must comply with the requirements of § 265.197 of these regulations, except for § 265.197(c)(2) through (c)(4).

**(g) Recordkeeping.**

The owner or operator must maintain in the operating record of the facility all information and data required by this section for five years.

**(h) Closure.**

At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the incinerator, boiler or industrial furnace. At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with § 261.3(d) of these regulations, that the residue removed from the incinerator, boiler or industrial furnace is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with applicable requirements of Parts 262 through 266 of these regulations.

**(i) Periodic sampling and analyses of environmental media (air, soil (and/or vegetation), surface water and/or ground water) in proximity to the incineration, boiler or industrial furnace facility:**

(1) If the results of the air dispersion modeling and risk assessment conducted under § 100.28(h) or § 100.28(i), § 264.347(d), or other information obtained by the Director, indicate that ambient levels of Appendix VIII constituents exceed a performance standard of the permit, the Director will require the owner or operator to sample environmental media and analyze it for the constituents of concern. The initial sampling conducted prior to operation of a hazardous waste incinerator, boiler, or industrial furnace if required, will be used to establish baseline levels of the constituents of concern at selected locations. Periodic monitoring of the media of concern for these compounds may be required in the facility's operating permit to provide for comparison with the baseline levels of the constituents of concern.

(2) If sampling of environmental media is required under this part, the owner or operator shall develop a sampling and analysis plan for the Director's review and approval. Following the Director's approval of the sampling and analysis plan and its subsequent implementation, the owner or operator shall prepare a report containing the results of such sampling and analyses to the Director. The Director shall review the results and provide comments to the owner or operator. Based on these results, the Director may require the owner or operator to perform revised and/or additional site specific risk assessments, using approved methods. Alternatively, the Director may modify the permit requirements appropriately to ensure that performance standards of this Subpart are not exceeded.

(3) If the results of sampling of any environmental media indicate that levels of any Appendix VIII constituents, or any other compounds, released as a result of hazardous waste incineration activities exceed performance standards of this Subpart, the Director shall modify, revoke and reissue, or terminate the State RCRA permit for the incineration facility.

**(j) Periodic stack emissions and compliance test and report:**

(1) The Director shall specify a periodic stack emissions sampling and analyses frequency in an incineration, boiler or industrial furnace facility's operating permit to ensure that the performance standards of this Subpart and the facility's permit are met, and to ensure protection of human health and the environment. The owner or operator shall conduct sampling and analysis, and report the results, in accordance with procedures specified in the facility's permit.

(2) The owner or operator shall conduct a comparison of measured emissions to performance standards of this Subpart using the results of testing required under this section as follows:

(i) The facility shall report the results of all Part 261, Appendix VIII compounds, any additional organic or metallic compounds, and other emissions (such as PM, HCl, Cl<sub>2</sub>) sampled and analyzed during the trial burn(s) or periodic compliance test.

(ii) The owner or operator shall perform a comparison of the measured emissions and predicted ambient air concentrations calculated from the approved air dispersion model, which are based on the measured emissions from the facility during the trial burn or compliance test, with the performance standards of this Subpart. The results of this comparison shall be reported in the trial burn or periodic compliance report.

(iii) If any performance standard of this Subpart is exceeded based on the emissions test and air dispersion modeling (or as determined through site specific ambient air sampling and analyses, if performed), the facility shall cease feeding hazardous waste immediately and notify the Director in writing of the results of this assessment. Feeding hazardous waste to the incineration, boiler or industrial furnace facility may resume only after the Director has reviewed the trial burn report or periodic compliance test results, as applicable, and the Director has allowed the owner or operator to resume hazardous waste operations, or has revised the facility operating permit to operate under modified operating conditions, or has approved a revised trial burn plan under § 100.28, and has issued a permit to conduct another trial burn.

**(k) Compound specific emissions monitoring:**

The Director will specify compound specific emissions monitoring in the facility's operating permit to demonstrate that the performance standards of this Subpart and the facility's permit are met, and to ensure protection of human health and the environment. Where such monitoring is required, the owner or operator shall assess the available technology for monitoring the required emissions. If the owner or operator cannot locate commercially available technology that meets the requirements for monitoring required by the Director, the owner or operator shall submit a certified statement to the Director documenting the facility's efforts to meet the requirement.

**(l) Remote data acquisition for continuously monitored operating conditions and emissions:**

The Director will require the owner or operator to provide a system for remote data acquisition of periodically or continuously monitored operating conditions and emissions in order to assess compliance with the facility's permit and the requirements of this Subpart. The performance characteristics of such a system shall be proposed in the facility's permit application, or specified by the Director in an operating permit.

**(m) Personnel training for hazardous waste incineration, boiler or industrial furnace facilities; Additional requirements.**

In addition to the requirements of § 264.16 of these regulations, an incineration, boiler or industrial furnace facility's personnel training plan shall meet the following requirements:

(1) Personnel involved in the operation of hazardous waste incinerators, boilers, and industrial furnaces shall complete a Division-approved training program designed to provide a thorough background in basic design, proper operation and maintenance of an incineration facility. The training curriculum shall include classroom and simulation training, and supervised on-the-job training at an operating incineration, boiler or industrial furnace facility. The program shall require that the trainee be trained in all phases of the facility operation in his/her area of assignment prior to working in an unsupervised position operating an incineration, boiler or industrial furnace facility. Operators shall receive training specific to the type of device, or aspect of the facility's operation, for which he/she will be responsible. The owner or operator shall document the content and date of each major phase of operator training, and the party responsible for providing the training.

(2) Operators of hazardous waste incinerators, boilers, and industrial furnaces shall not work in an unsupervised position until they have completed the training program required to operate the particular aspect of the facility operation for which they are assigned.

(3) Annual refresher: Incinerator, boiler, and industrial furnace operators shall receive an annual refresher, and periodic updates as necessary, to supplement initial training. The annual refresher shall be developed by qualified instructors and based on the original training program to demonstrate continued proficiency in the operators' area(s) of assignment at the facility.

(4) Prior to commencing operation of an incineration, boiler or industrial furnace facility, the owner or operator shall submit a list of qualified operators to the Division for review. The list of operators shall include copies of the operators' training and prior experience at combustion facilities. If any operator has deficiencies necessary to complete the approved training program, this training will be completed prior to working in an unsupervised position.

(5) Personnel involved in maintenance (those who are not assigned operators) of hazardous waste incinerators, boilers, and industrial furnaces shall be properly trained in a program with an explicit curriculum, and must satisfactorily complete training in their area of assignment prior to working in an unsupervised position.

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(6) Standard operating procedures for conducting inspections and maintenance activities shall be developed and maintained on-site. These documents shall be part of the facility's operating records, and must be kept up-to-date. Facility operators and maintenance personnel shall be trained on the operating procedures, and involved in their revision, where necessary.

(7) All personnel involved in operation of a hazardous waste incineration, boiler or industrial furnace facility shall receive thorough training in the facility's contingency plan and emergency response procedures prior to working in an unsupervised position at an operating incineration facility regulated by this Subpart.

**(n) Emergency Planning and Response for incineration, boiler or industrial furnace facilities; Additional requirements.**

(1) In addition to the requirements of Part 264-Subparts C and D, if local emergency response authorities decline to enter into emergency response arrangements, the owner or operator shall notify the Director in writing of this fact within 10 days of such refusal, and will prepare an alternative contingency plan addressing on-site and off-site releases of hazardous waste and constituents, and comply with § 264.31(b).

(2) In addition to the requirements of Part 264-Subparts C and D, an incineration, boiler or industrial furnace facility's emergency response arrangements shall designate each party's roles and responsibilities, and establish procedures for responding to off-site releases of hazardous waste and constituents.

(3) In addition to the requirements of Part 264-Subparts C and D, an incineration, boiler or industrial furnace facility's contingency/emergency plan shall contain:

(i) A "maximum credible accident" scenario for a hazardous waste emergency at the facility, and establish emergency measures to respond to such an incident, developed through coordination with local emergency response authorities. (If the facility is required to develop a risk management plan under the federal Clean Air Act and the implementing regulations, or under equivalent state air pollution control regulations, which addresses this requirement, the owner or operator shall notify the Division of this situation in order that he/she may evaluate consistency between these requirements.

(ii) Procedures for rapidly evaluating off-site impacts and a procedure for determining the need for evacuation of persons located outside the facility boundary which may be adversely affected by a release of hazardous waste or constituents.

(iii) A specific evacuation plan for persons located off-site in the event of a release of hazardous waste or constituents which would trigger a need for evacuation. In the event that local authorities take the lead responsibility for developing the evacuation plan for persons located outside the facility boundary, the owner or operator shall cooperate with the responsible agency(s) in its development. The owner or operator shall request a copy of the evacuation plan, maintain it and any subsequent revisions, at the facility as part of the facility's contingency plan, and assign responsibility in accordance with paragraph (i)(2) of this section.

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(4) The procedures for evaluating off-site releases and the off-site evacuation plan shall be subject to the review and concurrence of the local emergency response authorities prior to operation of the incineration, boiler or industrial furnace facility. In the event that local concurrence is not granted, the owner or operator shall promptly notify the Director in writing of this situation.

(5) The owner or operator shall provide appropriate training to those employees responsible for implementing the contingency/emergency plan, in accordance with the training plan requirements of § 264.16 and § 264.347(h) of these regulations.

(6) The owner or operator will attempt to coordinate periodic exercises with the local emergency response authorities, at a frequency acceptable to the responsible agency(s), to familiarize all responsible parties with the emergency response procedures and test the effectiveness of the contingency/emergency response plan. Based on the results of these exercises, the owner or operator, in consultation with the local emergency response authorities, shall make necessary revisions to the plan to ensure that it functions as designed in an emergency.

**§ 264.347 Regulation of residues.**

A residue derived from the burning or processing of hazardous waste in an boiler or industrial furnace is not excluded from the definition of a hazardous waste under § 261.4(b) (4), (7), or (8) unless the device and the owner or operator meet the following requirements:

(a) The device meets the following criteria:

(1) **Boilers.** Boilers must burn at least 50% coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal;

(2) **Ore or mineral furnaces.** Industrial furnaces subject to § 261.4(b)(7) must process at least 50% by weight normal, nonhazardous raw materials;

(3) **Cement kilns.** Cement kilns must process at least 50% by weight normal cement-production raw materials;

(b) The owner or operator demonstrates that the hazardous waste does not significantly affect the residue by demonstrating conformance with either of the following criteria:

(1) **Comparison of waste-derived residue with normal residue.** The waste-derived residue must not contain Appendix VIII, Part 261 constituents (toxic constituents) that could reasonably be attributable to the hazardous waste at concentrations significantly higher than in residue generated without burning or processing of hazardous waste, using the following procedure. Toxic compounds that could reasonably be attributable to burning or processing the hazardous waste (constituents of concern) include toxic constituents in the hazardous waste, and the organic compounds listed in Appendix VIII to § 264.348 of these regulations that may be generated as products of incomplete combustion. For polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans, analyses must be performed to determine specific congeners and homologues, and the results converted to 2,3,7,8-TCDD equivalent values using the procedure specified in section 4.0 of Appendix IX to § 264.348 of these regulations.

(i) **Normal residue.** Concentrations of toxic constituents of concern in normal residue shall be determined based on analyses of a minimum of 10 samples representing a minimum of 10 days of operation. Composite samples may be used to develop a sample for analysis provided that the compositing period does not exceed 24 hours. The upper tolerance limit (at 95% confidence with a 95% proportion of the sample distribution) of the concentration in the normal residue shall be considered the statistically-derived concentration in the normal residue. If changes in raw materials or fuels reduce the statistically-derived concentrations of the toxic constituents of concern in the normal residue, the statistically-derived concentrations must be revised or statistically-derived concentrations of toxic constituents in normal residue must be established for a new mode of operation with the new raw material or fuel. To determine the upper tolerance limit in the normal residue, the owner or operator shall use statistical procedures prescribed in "Statistical Methodology for Bevill Residue Determinations" in Appendix IX to § 264.348 of these regulations.

(ii) **Waste-derived residue.** Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the concentrations established for the normal residue under paragraph (b)(1)(i) of this section. If so, hazardous waste burning has significantly affected the residue and the residue shall not be excluded from the definition of a hazardous waste. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed 24 hours. If more than one sample is analyzed to characterize waste-derived residues generated over a 24-hour period, the concentration of each toxic constituent shall be the arithmetic mean of the concentrations in the samples. No results may be disregarded; or

(2) **Comparison of waste-derived residue concentrations with health-based limits—**

(i) **Nonmetal constituents.** The concentration of each nonmetal toxic constituent of concern (specified in paragraph (b)(1) of this section) in the waste-derived residue must not exceed the health-based level specified in Appendix VII to § 264.348 of these regulations, or the level of detection, whichever is higher. If a health-based limit for a constituent of concern is not listed in Appendix VII to § 264.348 of these regulations, then a limit of 0.002 micrograms per kilogram or the level of detection (which must be determined by using appropriate analytical procedures), whichever is higher, must be used. The levels specified in Appendix VII to § 264.348 of these regulations (and the default level of 0.002 micrograms per kilogram or the level of detection for constituents as identified in Note 1 of Appendix VII to § 264.348 of these regulations) are administratively stayed under the condition, for those constituents specified in paragraph (b)(1) of this section, that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in § 268.40 of these regulations for F039 nonwastewaters. In complying with those alternative levels, if an owner or operator is unable to detect a constituent despite documenting use of best good-faith efforts as defined by applicable Department guidance or standards, the owner or operator is deemed to be in compliance for that constituent. Until new guidance or standards are developed, the owner or operator may demonstrate such good faith efforts by achieving a detection limit for the constituent that does not exceed an order of magnitude above the level provided by § 268.40 of these regulations for F039 nonwastewaters. In complying with the § 268.40 of these regulations F039 nonwastewater levels for polychlorinated dibenzo-p-dioxins and polychlorinated dibenzo-furans, analyses must be performed for total hexachlorodibenzo-p-dioxins, total hexachlorodibenzofurans, total pentachlorodibenzo-p-dioxins, total pentachlorodibenzofurans, total tetrachlorodibenzo-p-dioxins, and total tetrachlorodibenzofurans.

**Note to this paragraph:** The administrative stay, under the condition that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in § 268.40 of these regulations for F039 nonwastewaters, remains in effect until further administrative action is taken and notice is published in the Colorado Register.

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(ii) **Metal constituents.** The concentration of metals in an extract obtained using the Toxicity Characteristic Leaching Procedure of § 261.24 of these regulations must not exceed the levels specified in Appendix VII to § 264.348 of these regulations; and

(iii) **Sampling and analysis.** Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the health-based levels. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed 24 hours. If more than one sample is analyzed to characterize waste-derived residues generated over a 24-hour period, the concentration of each toxic constituent shall be the arithmetic mean of the concentrations in the samples. No results may be disregarded; and

(c) Records sufficient to document compliance with the provisions of this section shall be retained until closure of the boiler or industrial furnace unit. At a minimum, the following shall be recorded.

(1) Levels of constituents in Appendix VIII, Part 261, that are present in waste-derived residues;

(2) If the waste-derived residue is compared with normal residue under paragraph (b)(1) of this section:

(i) The levels of constituents in Appendix VIII, Part 261, that are present in normal residues; and

(ii) Data and information, including analyses of samples as necessary, obtained to determine if changes in raw materials or fuels would reduce the concentration of toxic constituents of concern in the normal residue.

**Subpart L [Reserved]**

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**PART 264-SUBPART O**  
**Section 264.348**  
**APPENDICES I - XIII**

INSERT § 264.348 APPENDICES I – XIII HERE

**Subparts P through R [Reserved]**

**Subpart S -- Special Provisions for Cleanup**

**§ 264.550 Applicability of Corrective Action Management Unit (CAMU) Regulations.**

(a) Except as provided in paragraph (b) of this section, CAMUs are subject to the requirements of § 264.552.

(b) CAMUs that were approved prior to the April 22, 2002 effective date of the federal regulations, or for which substantially complete applications (or equivalents) were submitted to the Environmental Protection Agency (EPA) on or before November 20, 2000, are subject to the requirements in § 264.551 for grandfathered CAMUs. CAMU waste, activities, and design will not be subject to the standards in § 264.552, so long as the waste, activities, and design remain within the general scope of the CAMU as approved.

**§ 264.551 Grandfathered Corrective Action Management Units (CAMUs).**

(a) To implement remedies under § 100.26, 264.101, § 265.5 or section 25-15-308, C.R.S., or to implement remedies at a permitted facility that is not subject to § 264.101 of these regulations, the Department may designate an area at the facility as a corrective action management unit under the requirements in this section. As defined in § 260.10 of these regulations, a corrective action management unit (CAMU) means an area within a facility that is used only for managing CAMU-eligible wastes for implementing corrective action or cleanup at the facility. A CAMU must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.

(1) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes.

(2) For the purposes of the application of the minimum technology requirements of 40 CFR § 268.5(h)(2), or of the minimum technology requirements of Subparts K, L, M, or N, or the groundwater protection requirements of Subpart F or the closure and post-closure requirements of Subpart G of Part 264 or 265 of these regulations, consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a regulated unit.

(3) Where the remediation wastes placed into a CAMU are hazardous waste, the CAMU shall comply with Subparts B, C, D and E of Part 264 or 265 of these regulations and, when such remediation wastes will remain in place after closure of the CAMU, the CAMU shall comply with the regulations for the siting of hazardous waste disposal sites, 6 CCR 1007-2, Part 2.

(b)(1) The Department may designate a regulated unit (as defined in § 264.90(a)(2)) as a CAMU, or may incorporate a regulated unit into a CAMU, if:

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(i) The regulated unit is closed or closing, meaning it has begun the closure process under § 264.113 or § 265.113; and

(ii) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.

(2) The subpart F and G requirements and the unit-specific requirements of part 264 or 265 and the financial assurance requirements of Part 266 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.

(c) The Department shall designate a CAMU in accordance with the following:

(1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;

(2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;

(3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility;

(4) Areas within the CAMU, where remediation wastes remain in place after closure of the CAMU, shall be managed and contained so as to control, minimize, or eliminate future releases to the extent necessary to protect human health and the environment;

(5) The CAMU shall expedite the timing of remedial activity implementation, unless to do so would be inconsistent with § 264.552(c)(1) or (c)(2).

(6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of remediation wastes that will remain in place after closure of the CAMU; and

(7) The CAMU shall minimize the land area of the facility upon which remediation wastes will remain in place after closure of the CAMU, unless to do so would be inconsistent with § 264.552(c)(1) or (c)(2).

(d) The owner/operator shall provide sufficient information to enable the Department to designate a CAMU in accordance with the criteria in § 264.552.

(e) The Department shall specify, in the permit or order, requirements for CAMUs to include the following:

(1) The areal configuration of the CAMU.

(2) Requirements for remediation waste management to include the specification of applicable design, operation and closure requirements.

(3) Requirements for ground water monitoring that are sufficient to:

(i) Continue to detect and to characterize the nature, extent, concentration, direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and

(ii) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which remediation wastes will remain in place after closure of the CAMU.

(4) Closure and post-closure requirements.

(i) Closure of corrective action management units shall:

(A) Minimize the need for further maintenance; and

(B) Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where remediation wastes remain in place, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to ground water, to surface waters, or to the atmosphere.

(ii) Requirements for closure of any CAMU shall include the following, as appropriate and as deemed necessary by the Department to protect human health and the environment:

(A) Requirements for excavation, removal, treatment or containment of remediation wastes;

(B) For areas in which remediation wastes will remain after closure of the CAMU, requirements for capping and potentially lining of such areas; and

(C) Requirements for removal and decontamination of equipment, devices, and structures used in remediation waste management activities within the CAMU.

(iii) In establishing specific closure requirements for CAMUs under § 264.552(e), the Department shall consider the following factors:

(A) CAMU characteristics;

(B) Volume of remediation wastes which remain in place after closure;

(C) Potential for releases from the CAMU;

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(D) Physical and chemical characteristics of the remediation waste;

(E) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual releases; and

(F) Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.

(iv) Post-closure requirements as necessary to protect human health and the environment, shall include, for areas where remediation wastes will remain in place, monitoring and maintenance activities, and the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, bottom liner(s) or other containment system, and, in all instances, a notation to the deed to the facility property that will in perpetuity notify any potential purchaser of the property that the land has been used to manage remediation wastes which may or may not contain hazardous wastes, unless an alternative deed notation is approved by the Department.

(f) The Department shall document the rationale for designating CAMUs and shall make such documentation available to the public.

(g) Incorporation of a CAMU into an existing permit must be approved by the Department according to the procedures for Department-initiated permit modifications under § 100.61 of these regulations, or according to the permit modification procedures of § 100.63 of these regulations.

(h) Incorporation of a CAMU into a new permit must be approved by the Department according to the permit review and issuance procedures of § 100.5 of these regulations.

(i) Incorporation of a CAMU, where the remediation wastes which will remain in place are hazardous wastes, into an order issued pursuant to § 265.5 must be in accordance with the permits by rule provisions of § 100.21(e) of these regulations.

(j) The designation of a CAMU does not change the Department's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.

**§ 264.552 Corrective Action Management Units (CAMUs).**

(a) To implement remedies under § 100.26, § 264.101, § 265.5 or section 25-15-308, C.R.S., or to implement remedies at a permitted facility that is not subject to § 264.101, the Director may designate an area at the facility as a corrective action management unit under the requirements in this section. Corrective action management unit means an area within a facility that is used only for managing CAMU-eligible wastes for implementing corrective action or cleanup at the facility. A CAMU must be located within the contiguous property under the control of the owner or operator where the wastes to be managed in the CAMU originated. One or more CAMUs may be designated at a facility.

(1) **CAMU-eligible waste** means:

(i) All solid and hazardous wastes, and all media (including ground water, surface water, soils, and sediments) and debris, that are managed for implementing cleanup. As-generated wastes (either hazardous or non-hazardous) from ongoing industrial operations at a site are not CAMU-eligible wastes.

(ii) Wastes that would otherwise meet the description in paragraph (a)(1)(i) of this section are not “CAMU-Eligible Wastes” where:

(A) The wastes are hazardous wastes found during cleanup in intact or substantially intact containers, tanks, or other non-land-based units found either above ground or below ground, unless the wastes are both chemically and physically similar to the contaminated media found surrounding or beneath the intact or substantially intact containers, tanks, or other non-land-based units; or

(B) The Director exercises the discretion in paragraph (a)(2) of this section to prohibit the wastes from management in a CAMU.

(iii) Notwithstanding paragraph (a)(1)(i) of this section, where appropriate, as-generated non-hazardous waste may be placed in a CAMU where such waste is being used to facilitate treatment or the performance of the CAMU.

(2) The Director may prohibit, where appropriate, the placement of waste in a CAMU where the Director has or receives information that such wastes have not been managed in compliance with applicable land disposal treatment standards of Part 268 of these regulations, or applicable unit design requirements of this part, or applicable unit design requirements of Part 265 of these regulations, or that non-compliance with other applicable requirements of these regulations likely contributed to the release of the waste.

(3) **Prohibition against placing liquids in CAMUs.**

(i) The placement of bulk or noncontainerized liquid hazardous waste or free liquids contained in hazardous waste (whether or not sorbents have been added) in any CAMU is prohibited except where placement of such wastes facilitates the remedy selected for the waste.

(ii) The requirements in § 264.314(c) for placement of containers holding free liquids in landfills apply to placement in a CAMU except where placement facilitates the remedy selected for the waste.

(iii) The placement of any liquid which is not a hazardous waste in a CAMU is prohibited unless such placement is being used to facilitate waste treatment or the performance of the CAMU.

(iv) The absence or presence of free liquids in either a containerized or a bulk waste must be determined in accordance with § 264.314(d). Sorbents used to treat free liquids in CAMUs must meet the requirements of § 264.314(e).

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- (4) Placement of CAMU-eligible wastes into or within a CAMU does not constitute land disposal of hazardous wastes.
- (5) For the purposes of the application of the minimum technology requirements of 40 CFR § 268.5(h)(2), or of the minimum technology requirements of Subparts K, L, M, or N, or the groundwater protection requirements of Subpart F or the closure and post-closure requirements of Subpart G of Part 264 or 265 of these regulations, consolidation or placement of CAMU-eligible wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.
- (6) Where the remediation wastes placed into a CAMU are hazardous waste, the CAMU shall comply with Subparts B, C, D and E of Part 264 or 265 of these regulations and, when such remediation wastes will remain in place after closure of the CAMU, the CAMU shall comply with the regulations for the siting of hazardous waste disposal sites, 6 CCR 1007-2, Part 2.
- (b)(1) The Director may designate a regulated unit (as defined in § 264.90(a)(2)) as a CAMU, or may incorporate a regulated unit into a CAMU, if:
- (i) The regulated unit is closed or closing, meaning it has begun the closure process under § 264.113 or § 265.113 of these regulations; and
  - (ii) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.
- (2) The subpart F and G requirements and the unit-specific requirements of Part 264 or Part 265 and the financial assurance requirements of Part 266 of these regulations that applied to the regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.
- (c) The owner /operator shall provide sufficient information to enable the Department to designate a CAMU in accordance with the criteria in this section. The Director shall designate a CAMU that will be used for storage and/or treatment only in accordance with paragraph (f) of this section. The Director shall designate all other CAMUs in accordance with the following:
- (1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;
  - (2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;
  - (3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing CAMU-eligible waste is more protective than management of such wastes at contaminated areas of the facility;

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- (4) Areas within the CAMU, where remediation wastes remain in place after closure of the CAMU, shall be managed and contained so as to control, minimize, or eliminate future releases to the extent necessary to protect human health and the environment;
  - (5) The CAMU shall expedite the timing of remedial activity implementation, unless to do so would be inconsistent with § 264.552(c)(1) or (c)(2);
  - (6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of remediation wastes that will remain in place after closure of the CAMU; and
  - (7) The CAMU shall minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU, unless to do so would be inconsistent with § 264.552(c)(1) or (c)(2).
- (d) The owner/operator shall provide sufficient information to enable the Director to designate a CAMU in accordance with the criteria in this section. This must include, unless not reasonably available, information on:
- (1) The origin of the waste and how it was subsequently managed (including a description of the timing and circumstances surrounding the disposal and/or release);
  - (2) Whether the waste was listed or identified as hazardous at the time of disposal and/or release; and
  - (3) Whether the disposal and/or release of the waste occurred before or after the land disposal requirements of Part 268 of these regulations were in effect for the waste listing or characteristic.
- (e) The Director shall specify, in the permit or order, requirements for CAMUs to include the following:
- (1) The areal configuration of the CAMU.
  - (2) Except as provided in paragraph (g) of this section, requirements for CAMU-eligible waste management to include the specification of applicable design, operation, treatment and closure requirements.
  - (3) **Minimum design requirements.** CAMUs that consist of new, replacement, or laterally expanded units, except as provided in paragraph (f) of this section, into which wastes are placed shall comply with regulations for the siting of hazardous waste disposal sites, 6 CCR 1007-2, Part 2, and must be designed to assure long-term protection of human health and the environment by preventing adverse effects on any of the following: groundwater quality, surface water quality, air quality, or ecological receptors. The siting, design and operation of a CAMU must provide reasonable assurance that the wastes will remain isolated within the designated disposal area and will not pose a threat to public health or the environment by migrating into the environment.

(4) **Minimum treatment requirements.** Unless the wastes will be placed in a CAMU for storage and/or treatment only in accordance with paragraph (f) of this section, CAMU-eligible wastes that, absent this section, would be subject to the treatment requirements of Part 268 of these regulations, and that the Director determines contain principal hazardous constituents must be treated to the standards specified in paragraph (e)(4)(iii) of this section.

(i) Principal hazardous constituents are those constituents that the Director determines pose a risk to human health and the environment substantially higher than the risks associated with the cleanup levels or goals at the site.

(A) In general, the Director will designate as principal hazardous constituents:

(1) Carcinogens that pose a potential direct risk from combined exposure pathways at the site at or above  $1 \times 10^{-4}$  using an unrestricted use exposure scenario; and

(2) Non-carcinogens that pose a potential direct risk from combined exposure pathways at the site an order of magnitude or greater than their reference concentration using an unrestricted use exposure scenario.

(B) The Director will also designate constituents as principal hazardous constituents, where appropriate, when risks to human health and the environment posed by the potential migration of constituents in wastes to surface water and/or ground water are substantially higher than the risks associated with the cleanup levels or goals at the site; when making such a designation, the Director may consider such factors as constituent concentrations, and fate and transport characteristics under site conditions.

(C) The Director may also designate other constituents as principal hazardous constituents that the Director determines pose a risk to human health and the environment substantially higher than the cleanup levels or goals at the site.

(ii) In determining which constituents are “principal hazardous constituents,” the Director must consider all constituents which, absent this section, would be subject to the treatment requirements in Part 268 of these regulations.

(iii) Waste that the Director determines contains principal hazardous constituents must meet treatment standards determined in accordance with paragraph (e)(4)(iv) or (e)(4)(v) of this section.

(iv) **Treatment standards for wastes placed in CAMUs.**

(A) For non-metals, treatment must achieve 90 percent reduction in total principal hazardous constituent concentrations, except as provided by paragraph (e)(4)(iv)(C) of this section.

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(B) For metals, treatment must achieve 90 percent reduction in principal hazardous constituent concentrations as measured in leachate from the treated waste or media (tested according to the TCLP) or 90 percent reduction in total constituent concentrations (when a metal removal treatment technology is used), except as provided by paragraph (e)(4)(iv)(C) of this section.

(C) When treatment of any principal hazardous constituent to a 90 percent reduction standard would result in a concentration less than 10 times the Universal Treatment Standard for that constituent, treatment to achieve constituent concentrations less than 10 times the Universal Treatment Standard is not required. Universal Treatment Standards are identified in § 268.48 Table UTS of these regulations.

(D) For waste exhibiting the hazardous characteristic of ignitability, corrosivity or reactivity, the waste must also be treated to eliminate these characteristics.

(E) For debris, the debris must be treated in accordance with § 268.45 of these regulations, or by methods or to levels established under paragraphs (e)(4)(iv)(A) through (D) or paragraph (e)(4)(v) of this section, whichever the Director determines is appropriate.

(F) **Alternatives to TCLP.** For metal bearing wastes for which metals removal treatment is not used, the Director may specify a leaching test other than the TCLP (SW-846 Method 1311, incorporated by reference in § 260.11(a)(11)) to measure treatment effectiveness, provided the Director determines that an alternative leach testing protocol is appropriate for use, and that the alternative more accurately reflects conditions at the site that affect leaching.

(v) **Adjusted standards.** The Director may adjust the treatment level or method in paragraph (e)(4)(iv) of this section to a higher or lower level, based on one or more of the following factors, as appropriate. The adjusted level or method must be protective of human health and the environment:

(A) The technical impracticability of treatment to the levels or by the methods in paragraph (e)(4)(iv) of this section;

(B) The levels or methods in paragraph (e)(4)(iv) of this section would result in concentrations of principal hazardous constituents (PHCs) that are significantly above or below cleanup standards applicable to the site (established either site-specifically, or promulgated under state or federal law);

(C) The views of the affected local community on the treatment levels or methods in paragraph (e)(4)(iv) of this section as applied at the site, and, for treatment levels, the treatment methods necessary to achieve these levels;

(D) The short-term risks presented by the on-site treatment method necessary to achieve the levels or treatment methods in paragraph (e)(4)(iv) of this section;

(E) The long-term protection offered by the engineering design of the CAMU and related engineering controls:

(1) Where the treatment standards in paragraph (e)(4)(iv) of this section are substantially met and the principal hazardous constituents in the waste or residuals are of very low mobility; or

(2) Where cost-effective treatment has been used and the CAMU meets the Subtitle C liner and leachate collection requirements for new land disposal units at § 264.301(c) and (d); or

(3) Where, after review of appropriate treatment technologies, the Director determines that cost-effective treatment is not reasonably available, and the CAMU meets the Subtitle C liner and leachate collection requirements for new land disposal units at § 264.301(c) and (d); or

(4) Where cost-effective treatment has been used and the principal hazardous constituents in the treated wastes are of very low mobility; or

(5) Where, after review of appropriate treatment technologies, the Director determines that cost-effective treatment is not reasonably available, the principal hazardous constituents in the wastes are of very low mobility, and either the CAMU meets or exceeds the standards for new, replacement, or laterally expanded CAMUs in paragraph (e)(3) of this section, or the CAMU provides substantially equivalent or greater protection.

(vi) The treatment required by the treatment standards must be completed prior to, or within a reasonable time after, placement in the CAMU.

(vii) For the purpose of determining whether wastes placed in CAMUs have met site-specific treatment standards, the Director may, as appropriate, specify a subset of the principal hazardous constituents in the waste as analytical surrogates for determining whether treatment standards have been met for other principal hazardous constituents. This specification will be based on the degree of difficulty of treatment and analysis of constituents with similar treatment properties.

(5) Except as provided in paragraph (f) of this section, requirements for ground water monitoring and corrective action that are sufficient to:

(i) Continue to detect and to characterize the nature, extent, concentration, direction, and movement of existing releases of hazardous constituents in ground water from sources located within the CAMU; and

- (ii) Detect and subsequently characterize releases of hazardous constituents to ground water that may occur from areas of the CAMU in which remediation wastes will remain in place after closure of the CAMU; and
  - (iii) Require notification to the Director and corrective action as necessary to protect human health and the environment for releases to ground water from the CAMU.
- (6) Except as provided in paragraph (f) of this section, closure and post-closure requirements:
- (i) Closure of corrective action management units shall:
    - (A) Minimize the need for further maintenance; and
    - (B) Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, for areas where wastes remain in place, post-closure escape of hazardous wastes, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, to ground water, to surface waters, or to the atmosphere.
  - (ii) Requirements for closure of any CAMUs shall include the following, as appropriate and as deemed necessary by the Director for a given CAMU in order to protect human health and the environment:
    - (A) Requirements for excavation, removal, treatment or containment of remediation wastes; and
    - (B) Requirements for removal and decontamination of equipment, devices, and structures used in CAMU-eligible waste management activities within the CAMU.
  - (iii) In establishing specific closure requirements for CAMUs under paragraph (e) of this section, the Director shall consider the following factors:
    - (A) CAMU characteristics;
    - (B) Volume of remediation wastes which remain in place after closure;
    - (C) Potential for releases from the CAMU;
    - (D) Physical and chemical characteristics of the remediation waste;
    - (E) Hydrological and other relevant environmental conditions at the facility which may influence the migration of any potential or actual releases; and
    - (F) Potential for exposure of humans and environmental receptors if releases were to occur from the CAMU.

(iv) **Cap requirements:**

(A) At final closure of the CAMU, for areas in which wastes will remain after closure of the CAMU, with constituent concentrations at or above remedial levels or goals applicable to the site, the owner or operator must cover the CAMU with a final cover designed and constructed to meet the following performance criteria, except as provided in paragraph (e)(6)(iv)(B) of this section:

- (1) Provide long-term minimization of migration of liquids through the closed unit;
- (2) Function with minimum maintenance;
- (3) Promote drainage and minimize erosion or abrasion of the cover;
- (4) Accommodate settling and subsidence so that the cover's integrity is maintained; and
- (5) Have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present, or allow no more percolation than would pass through the bottom liner system or an equivalent thickness of the natural subsoils present.

(B) The Director may determine that modifications to paragraph (e)(6)(iv)(A) of this section are needed to facilitate treatment or the performance of the CAMU (e.g., to promote biodegradation).

(v) Post-closure requirements as necessary to protect human health and the environment, shall include, for areas where remediation wastes will remain in place:

- (A) Monitoring and maintenance activities, including the frequency with which such activities shall be performed to ensure the integrity of any cap, final cover, bottom liner(s) or other containment system; and
- (B) An environmental covenant pursuant to section 25-15-320, C.R.S., that includes a notice that the land has been used to manage remediation wastes which may or may not contain hazardous wastes.

(f) CAMUs used for storage and/or treatment only are CAMUs in which wastes will not remain after closure. Such CAMUs must be designated in accordance with all of the requirements of this section, except as follows:

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- (1) CAMUs that are used for storage and/or treatment only and that operate in accordance with the time limits established in the staging pile regulations at § 264.554(d)(1)(iii), (h), and (i) are subject to the requirements for staging piles at § 264.554(d)(1)(i) and (ii), § 264.554(d)(2), § 264.554(e) and (f), and § 264.554(j) and (k) in lieu of the performance standards and requirements for CAMUs in this section at paragraphs (c) and (e)(3) through (6).
- (2) CAMUs that are used for storage and/or treatment only and that do not operate in accordance with the time limits established in the staging pile regulations at § 264.554(d)(1)(iii), (h), and (i):
- (i) Must operate in accordance with a time limit, established by the Director, that is no longer than necessary to achieve a timely remedy selected for the waste, and
  - (ii) Are subject to the requirements for staging piles at § 264.554(d)(1)(i) and (ii), § 264.554(d)(2), § 264.554(e) and (f), and § 264.554(j) and (k) in lieu of the performance standards and requirements for CAMUs in this section at paragraphs (c) and (e)(4) and (6).
- (g) CAMUs into which wastes are placed where all wastes have constituent levels at or below remedial levels or goals applicable to the site do not have to comply with the requirements at paragraph (e)(3) of this section, the cap requirements at paragraph (e)(6)(iv) of this section, the ground water monitoring requirements at paragraph (e)(5) of this section or, for treatment and/or storage-only CAMUs, the design standards at paragraph (f) of this section. As used in this subsection, “remedial levels or goals” means concentration levels of contaminants in environmental media that are established on the assumption there are no containment structures in place.
- (h) The Director shall provide public notice and a reasonable opportunity for public comment before designating a CAMU. Such notice shall include the rationale for any proposed adjustments under paragraph (e)(4)(v) of this section to the treatment standards in paragraph (e)(4)(iv) of this section.
- (i) Notwithstanding any other provision of this section, the Director may impose additional requirements as necessary to protect human health and the environment.
- (j) Incorporation of a CAMU into an existing permit must be approved by the Director according to the procedures for Department-initiated permit modifications under § 100.61 of these regulations, or according to the permit modification procedures of § 100.63 of these regulations.
- (k) Incorporation of a CAMU into a new permit must be approved by the Department according to the permit review and issuance procedures of § 100.5 of these regulations.
- (l) Incorporation of a CAMU, where the remediation wastes which will remain in place are hazardous wastes, into an order issued pursuant to § 265.5 must be in accordance with the permits by rule provisions of § 100.21(e) of these regulations.

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(m) The designation of a CAMU does not change the Department's existing authority to address clean-up levels, media-specific points of compliance to be applied to remediation at a facility, or other remedy selection decisions.

**§ 264.553 Temporary Units (TU).**

(a) For temporary tanks and container storage areas used to treat or store hazardous remediation wastes during remedial activities required under § 100.26, § 264.101, § 265.5, or section 25-15-308, C.R.S., or at a permitted facility that is not subject to § 264.101, the Department may designate a unit at the facility, as a temporary unit. A temporary unit must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the temporary unit originated. For temporary units, the Department may replace the design, operating, or closure standard applicable to these units under this Part 264 or Part 265 of these regulations with alternative requirements which protect human health and the environment.

(b) Any temporary unit to which alternative requirements are applied in accordance with paragraph (a) of this section shall be:

- (1) Located within the facility boundary; and
- (2) Used only for treatment or storage of remediation wastes.

(c) In establishing standards to be applied to a temporary unit, the Department shall consider the following factors:

- (1) Length of time such unit will be in operation;
- (2) Type of unit;
- (3) Volumes of remediation wastes to be managed;
- (4) Physical and chemical characteristics of the remediation wastes to be managed in the unit;
- (5) Potential for releases from the unit;
- (6) Hydrogeological and other relevant environmental conditions at the facility which may influence the migration of any potential releases; and
- (7) Potential for exposure of humans and environmental receptors if releases were to occur from the unit.

(d) The Department shall specify in the permit or order the length of time a temporary unit will be allowed to operate, to be no longer than a period of one year. The Department shall also specify the design, operating, and closure requirements for the unit.

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(e) The Department may extend the operational period of a temporary unit once for no longer than a period of one year beyond that originally specified in the permit or order, if the Department determines that:

- (1) Continued operation of the unit will not pose a threat to human health and the environment; and
- (2) Continued operation of the unit is necessary to ensure timely and efficient implementation of remedial actions at the facility.

(f) Incorporation of a temporary unit or a time extension for a temporary unit into an existing permit shall be:

- (1) Approved in accordance with the procedures for Department-initiated permit modifications under § 100.61; or
- (2) Requested by the owner/operator as a Class II modification according to the procedures under § 100.63 of these regulations.

(g) Incorporation of a temporary unit or a time extension for a temporary unit into a new permit shall be approved by the Department according to the permit review and issuance procedures of § 100.5 of these regulations.

(h) Incorporation of a temporary unit or a time extension for a temporary unit into an order issued pursuant to § 265.5 must be in accordance with the permits by rule provisions of § 100.21(e) of these regulations.

(i) The Department shall document the rationale for designating a temporary unit and for granting time extensions for temporary units and shall make such documentation available to the public.

**§ 264.554 Staging piles.**

This section is written in a special format to make it easier to understand the regulatory requirements. Like other state regulations, this establishes enforceable legal requirements. For this “I” and “you” refer to the owner/operator.

**(a) What is a staging pile?** A staging pile is an accumulation of solid, non-flowing remediation waste (as defined in § 260.10 of these regulations) that is not a containment building and is used only during remedial operations for temporary storage at a facility. A staging pile must be located within the contiguous property under the control of the owner/operator where the wastes to be managed in the staging pile originated. Staging piles must be designated by the Director according to the requirements in this section.

(1) For the purposes of this section, storage includes mixing, sizing, blending, or other similar physical operations as long as they are intended to prepare the wastes for subsequent management or treatment.

(2) [Reserved]

**(b) When may I use a staging pile?** You may use a staging pile to store hazardous remediation waste (or remediation waste otherwise subject to land disposal restrictions) only if you follow the standards and design criteria the Director has designated for that staging pile. The Director must designate the staging pile in a permit (including RAPs), or in a closure plan or order for an interim status facility. The Director must establish conditions in the permit, closure plan, or order that comply with paragraphs (d) through (k) of this section.

**(c) What information must I provide to get a staging pile designated?** When seeking a staging pile designation, you must provide:

(1) Sufficient and accurate information to enable the Director to impose standards and design criteria for your staging pile according to paragraphs (d) through (k) of this section;

(2) Certification by an independent, qualified, registered professional engineer for technical data, such as design drawings and specifications, and engineering studies, unless the Director determines, based on information that you provide, that this certification is not necessary to ensure that a staging pile will protect human health and the environment; and

(3) Any additional information the Director determines is necessary to protect human health and the environment.

**(d) What performance criteria must a staging pile satisfy?** The Director must establish the standards and design criteria for the staging pile in the permit, closure plan, or order.

(1) The standards and design criteria must comply with the following:

(i) The staging pile must facilitate a reliable, effective and protective remedy;

(ii) The staging pile must be designed so as to prevent or minimize releases of hazardous wastes and hazardous constituents into the environment, and minimize or adequately control cross-media transfer, as necessary to protect human health and the environment (for example, through the use of liners, covers, run-off/run-on controls, as appropriate); and

(iii) The staging pile must not operate for more than two years, except when the Director grants an operating term extension under paragraph (i) of this section (entitled "May I receive an operating extension for a staging pile?"). You must measure the two-year limit, or other operating term specified by the Director in the permit, closure plan, or order, from the first time you place remediation waste into a staging pile. You must maintain a record of the date when you first placed remediation waste into the staging pile for the life of the permit, closure plan, or order, or for three years, whichever is longer.

(2) In setting the standards and design criteria, the Director must consider the following factors:

- (i) Length of time the pile will be in operation;
- (ii) Volumes of wastes you intend to store in the pile;
- (iii) Physical and chemical characteristics of the wastes to be stored in the unit;
- (iv) Potential for releases from the unit;
- (v) Hydrogeological and other relevant environmental conditions at the facility that may influence the migration of any potential releases; and
- (vi) Potential for human and environmental exposure to potential releases from the unit.

**(e) May a staging pile receive ignitable or reactive remediation waste?** You must not place ignitable or reactive remediation waste in a staging pile unless:

- (1) You have treated, rendered or mixed the remediation waste before you placed it in the staging pile so that:
  - (i) The remediation waste no longer meets the definition of ignitable or reactive under § 261.21 or § 261.23 of these regulations; and
  - (ii) You have complied with § 264.17(b); or
- (2) You manage the remediation waste to protect it from exposure to any material or condition that may cause it to ignite or react.

**(f) How do I handle incompatible remediation wastes in a staging pile?** The term “incompatible waste” is defined in § 260.10 of these regulations. You must comply with the following requirements for incompatible wastes in staging piles:

- (1) You must not place incompatible remediation wastes in the same staging pile unless you have complied with § 264.17(b) of these regulations;
- (2) If remediation waste in a staging pile is incompatible with any waste or material stored nearby in containers, other piles, open tanks or land disposal units (for example, surface impoundments), you must separate the incompatible materials, or protect them from one another by using a dike, berm, wall or other device; and
- (3) You must not pile remediation waste on the same base where incompatible wastes or materials were previously piled, unless the base has been decontaminated sufficiently to comply with § 264.17(b) of these regulations.

**(g) Are staging piles subject to Land Disposal Restrictions (LDR) and Minimum**

**Technological Requirements (MTR)?** No. Placing hazardous remediation wastes into a staging pile does not constitute land disposal of hazardous wastes or create a unit that is subject to the minimum technological requirements of RCRA 3004(o).

**(h) How long may I operate a staging pile?** The Director may allow a staging pile to operate for up to two years after hazardous remediation waste is first placed into the pile. You must use a staging pile no longer than the length of time designated by the Director in the permit, closure plan, or order (the “operating term”), except as provided in paragraph (i) of this section.

**(i) May I receive an operating extension for a staging pile?**

(1) The Director may grant one operating term extension of up to 180 days beyond the operating term limit contained in the permit, closure plan, or order (see paragraph (1) of this section for modification procedures). To justify to the Director the need for an extension, you must provide sufficient and accurate information to enable the Director to determine that continued operation of the staging pile:

(i) Will not pose a threat to human health and the environment; and

(ii) Is necessary to ensure timely and efficient implementation of remedial actions at the facility.

(2) The Director may, as a condition of the extension, specify further standards and design criteria in the permit, closure plan, or order, as necessary, to ensure protection of human health and the environment.

**(j) What is the closure requirement for a staging pile located in a previously contaminated area?**

(1) Within 180 days after the operating term of the staging pile expires, you must close a staging pile located in a previously contaminated area of the site by removing or decontaminating all:

(i) Remediation waste;

(ii) Contaminated containment system components; and

(iii) Structures and equipment contaminated with waste and leachate.

(2) You must also decontaminate contaminated subsoils in a manner and according to a schedule that the Director determines will protect human health and the environment.

(3) The Director must include the above requirements in the permit, closure plan, or order in which the staging pile is designated.

**(k) What is the closure requirement for a staging pile located in an uncontaminated area?**

(1) Within 180 days after the operating term of the staging pile expires, you must close a staging pile located in an uncontaminated area of the site according to §§ 264.258(a) and 264.111; or according to §§ 265.258(a) and 265.111 of these regulations.

(2) The Director must include the above requirement in the permit, closure plan, or order in which the staging pile is designated.

**(l) How may my existing permit (for example, RAP), closure plan, or order be modified to allow me to use a staging pile?**

(1) To modify a permit, other than a RAP, to incorporate a staging pile or staging pile operating term extension, either:

(i) The Director must approve the modification under the procedures for Agency-initiated permit modifications in § 100.61 of these regulations; or

(ii) You must request a Class 2 modification under § 100.63 of these regulations.

(2) To modify a RAP to incorporate a staging pile or staging pile operating term extension, you must comply with the RAP modification requirements under §§ 100.27(d)(1) and 100.27(d)(2) of these regulations.

(3) To modify a closure plan to incorporate a staging pile or staging pile operating term extension, you must follow the applicable requirements under § 264.112(c) or § 265.112(c) of these regulations.

(4) To modify an order to incorporate a staging pile or staging pile operating term extension, you must follow the terms of the order.

**(m) Is information about the staging pile available to the public?** The Director must document the rationale for designating a staging pile or staging pile operating term extension and make this documentation available to the public.

**Subparts T through V [Reserved]**

**Subpart W -- Drip Pads**

**§ 264.570 Applicability.**

(a) The requirements of this subpart apply to owners and operators of facilities that use new or existing drip pads to convey treated wood drippage, precipitation, and/or surface water run-off to an associated collection system. Existing drip pads are those constructed before December 6, 1990 and those for which the owner or operator has a design and has entered into binding financial or other agreements for construction prior to December 6, 1990. All other drip pads are new drip pads. The requirement at § 264.573(b)(3) to install a leak collection system applies only to those drip pads that are constructed after December 24, 1992 except for those constructed after December 24, 1992 for which the owner or operator has a design and has entered into binding financial or other agreements for construction prior to December 24, 1992.

(b) The owner or operator of any drip pad that is inside or under a structure that provides protection from precipitation so that neither run-off nor run-on is generated is not subject to regulation under § 264.573(e) or § 264.573(f), as appropriate.

(c) The requirements of this subpart are not applicable to the management of infrequent and incidental drippage in storage yards provided that:

(1) The owner or operator maintains and complies with a written contingency plan that describes how the owner or operator will respond immediately to the discharge of such infrequent and incidental drippage. At a minimum, the contingency plan must describe how the owner or operator will do the following:

- (i) Clean up the drippage;
- (ii) Document the cleanup of the drippage;
- (iii) Retain documents regarding cleanup for three years; and

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(iv) Manage the contaminated media in a manner consistent with federal and state regulations.

**§ 264.571 Assessment of existing drip pad integrity.**

(a) For each existing drip pad as defined in § 264.570 of this subpart, the owner or operator must evaluate the drip pad and determine that it meets all of the requirements of this subpart, except the requirements for liners and leak detection systems of § 264.573(b). No later than the effective date of this rule, the owner or operator must obtain and keep on file at the facility a written assessment of the drip pad, reviewed and certified by an independent, qualified registered professional engineer that attests to the results of the evaluation. The assessment must be reviewed, updated, and re-certified annually until all upgrades, repairs or modifications necessary to achieve compliance with all of the standards of § 264.573 of this subpart are complete. The evaluation must document the extent to which the drip pad meets each of the design and operating standards of § 264.573 of this subpart, except the standards for liners and leak detection systems, specified in § 264.573(b) of this subpart.

(b) The owner or operator must develop a written plan for upgrading, repairing, and modifying the drip pad to meet the requirements of § 264.573(b) of this subpart and submit the plan to the Director no later than 2 years before the date that all repairs, upgrades, and modifications are complete. This written plan must describe all changes to be made to the drip pad in sufficient detail to document compliance with all the requirements of § 264.573 of this subpart. The plan must be reviewed and certified by an independent, qualified registered professional engineer.

(c) Upon completion of all upgrades, repairs and modifications, the owner or operator must submit to the Director the as-built drawings for the drip pad together with a certification by an independent, qualified registered professional engineer attesting that the drip pad conforms to the drawings.

(d) If the drip pad is found to be leaking or unfit for use, the owner or operator must comply with the provisions of § 264.573(m) of this subpart or close the drip pad in accordance with § 264.575 of this subpart.

**§ 264.572 Design and installation of new drip pads.**

Owners and operators of new drip pads must ensure that the pads are designed, installed and operated in accordance with one of the following:

- (a) All of the requirements of §§ 264.573 (except § 264.573(a)(4)), 264.574 and 264.575 of this subpart, or
- (b) All of the requirements of §§ 264.573 (except § 264.573(b)), 264.574 and 264.575 of this subpart.

**§ 264.573 Design and operating requirements.**

(a) Drip pads must:

(1) Be constructed of non-earthen materials, excluding wood and non-structurally supported asphalt;

(2) Be sloped to free-drain treated wood drippage, rain and other waters, or solutions of drippage and water or other wastes to the associated collection system;

(3) Have a curb or berm around the perimeter;

(4)(i) Have a hydraulic conductivity of less than or equal to  $1 \times 10^{-7}$  centimeters per second, e.g., existing concrete drip pads must be sealed, coated, or covered with a surface material with a hydraulic conductivity of less than or equal to  $1 \times 10^{-7}$  centimeters per second such that the entire surface where drippage occurs or may run across is capable of containing such drippage and mixtures of drippage and precipitation, materials, or other wastes while being routed to an associated collection system. This surface material must be maintained free of cracks and gaps that could adversely affect its hydraulic conductivity, and the material must be chemically compatible with the preservatives that contact the drip pad. The requirements of this provision apply only to existing drip pads and those drip pads for which the owner or operator elects to comply with § 264.572(b) instead of § 264.572(a).

(ii) The owner or operator must obtain and keep on file at the facility a written assessment of the drip pad, reviewed and certified by an independent, qualified registered professional engineer that attests to the results of the evaluation. The assessment must be reviewed, updated and recertified annually. The evaluation must document the extent to which the drip pad meets the design and operating standards of this section, except for paragraph (b) of this section.

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(5) Be of sufficient structural strength and thickness to prevent failure due to physical contact, climatic conditions, the stress of installation, and the stress of daily operations, e.g., variable and moving loads such as vehicle traffic, movement of wood, etc.

Note: The Department will generally consider applicable standards established by professional organizations generally recognized by the industry such as the American Concrete Institute (ACI) or the American Society of Testing Materials (ASTM) in judging the structural integrity requirement of this paragraph.

(b) If an owner/operator elects to comply with § 264.572(a) instead of § 264.572(b), the drip pad must have:

(1) A synthetic liner installed below the drip pad that is designed, constructed, and installed to prevent leakage from the drip pad into the adjacent subsurface soil or groundwater or surface water at any time during the active life (including the closure period) of the drip pad. The liner must be constructed of materials that will prevent waste from being absorbed into the liner and to prevent releases into the adjacent subsurface soil or groundwater or surface water during the active life of the facility. The liner must be:

(i) Constructed of materials that have appropriate chemical properties and sufficient strength and thickness to prevent failure due to pressure gradients (including static head and external hydrogeologic forces), physical contact with the waste or drip pad leakage to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation (including stresses from vehicular traffic on the drip pad);

(ii) Placed upon a foundation or base capable of providing support to the liner and resistance to pressure gradients above and below the liner to prevent failure of the liner due to settlement, compression, or uplift; and

(iii) Installed to cover all surrounding earth that could come in contact with the waste or leakage; and

(2) A leakage detection system immediately above the liner that is designed, constructed, maintained, and operated to detect leakage from the drip pad. The leakage detection system must be:

(i) Constructed of materials that are:

(A) Chemically resistant to the waste managed in the drip pad and the leakage that might be generated; and

(B) Of sufficient strength and thickness to prevent collapse under the pressures exerted by overlaying materials and by any equipment used at the drip pad;

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(ii) Designed and operated to function without clogging through the scheduled closure of the drip pad; and

(iii) Designed so that it will detect the failure of the drip pad or the presence of a release of hazardous waste or accumulated liquid at the earliest possible time.

(3) A leakage collection system immediately above the liner that is designed, constructed, maintained and operated to collect leakage from the drip pad such that it can be removed from below the drip pad. The date, time, and quantity of any leakage collected in this system and removed must be documented in the operating log.

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

Note: See § 264.573(m) for remedial action required if deterioration or leakage is detected.

(d) The drip pad and associated collection system must be designed and operated to convey, drain, and collect liquid resulting from drippage or precipitation in order to prevent run-off.

(e) Unless protected by a structure, as described in § 264.570(b) of this subpart, the owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the drip pad during peak discharge from at least a 24-hour, 25-year storm, unless the system has sufficient excess capacity to contain any run-off that might enter the system.

(f) Unless protected by a structure or cover, as described in § 264.570(b) of this subpart, the owner or operator must design, construct, operate and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

(g) The drip pad must be evaluated to determine that it meets the requirements of paragraphs (a) through (f) of this section and the owner or operator must obtain a statement from an independent, qualified registered professional engineer certifying that the drip pad design meets the requirements of this section.

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

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(i) The drip pad surface must be cleaned thoroughly in a manner and frequency such that accumulated residues of hazardous waste or other materials are removed, with residues being properly managed as hazardous waste, so as to allow weekly inspections of the entire drip pad surface without interference or hindrance from accumulated residues of hazardous waste or other materials on the drip pad. The owner or operator must document the date and time of each cleaning and the cleaning procedure used in the facility's operating log. The owner/operator must determine if the residues are hazardous as per 6 CCR 1007-3 § 262.11 and, if so, must manage them under Parts 261-268, and Parts 99 and 100.

(j) Drip pads must be operated and maintained in a manner to minimize tracking of hazardous waste or hazardous waste constituents off the drip pad as a result of the activities by personnel or equipment.

(k) After being removed from the treatment vessel, treated wood from pressure and non-pressure processes must be held on the drip pad until drippage has ceased. The owner or operator must maintain records sufficient to document that all treated wood is held on the pad following treatment in accordance with this requirement.

(l) Collection and holding units associated with run-on and run-off control systems must be emptied or otherwise managed as soon as possible after storms to maintain design capacity of the system.

(m) Throughout the active life of the drip pad and as specified in the permit, if the owner or operator detects a condition that may cause, may have caused, or has caused a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery, in accordance with the following procedures:

(1) Upon detection of a condition that may cause, may have caused, or has caused a release of hazardous waste (e.g., upon detection of leakage in the leak detection system), the owner or operator must:

(i) Enter a record of the discovery in the facility operating log;

(ii) Immediately remove the portion of the drip pad affected by the condition from service;

(iii) Determine what steps must be taken to repair the drip pad and clean up any leakage from below the drip pad, and establish a schedule for accomplishing the repairs;

(iv) Within 24 hours after the discovery of the condition, notify the Director of the condition and, within 10 working days, provide written notice to the Director with a description of the steps that will be taken to repair the drip pad and clean up any leakage, and the schedule for accomplishing this work.

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- (2) The Director will review the information submitted, make a determination regarding whether the pad must be removed from service completely or partially until repairs and clean up are complete, and notify the owner or operator of the determination and the underlying rationale in writing.
- (3) Upon completing all repairs and clean up, the owner or operator must notify the Director in writing and provide a certification signed by an independent, qualified registered professional engineer, that the repairs and clean up have been completed according to the written plan submitted in accordance with paragraph (m)(1)(iv) of this section.
- (n) Should a permit be necessary, the Director will specify in the permit all design and operating practices necessary to ensure that the requirements of this section are satisfied.
- (o) The owner or operator must maintain, as part of the facility operating log, documentation of past operating and waste handling practices. This must include identification of preservative formulations used in the past, a description of drippage management practices, and a description of treated wood storage and handling practices.

### § 264.574 Inspections.

- (a) During construction or installation, liners and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots or foreign materials). Immediately after construction or installation, the liners must be inspected and certified as meeting the requirements of § 264.573 of this subpart by an independent, qualified registered professional engineer. The certification must be maintained at the facility as part of the facility operating record. After installation, liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters.
- (b) While a drip pad is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:
- (1) Deterioration, malfunctions, or improper operation of run-off and run-on control systems;
  - (2) The presence of leakage in and proper functioning of leak detection systems.
  - (3) Deterioration or cracking of the drip pad surface.

Note: See § 264.573(m) for remedial action required if deterioration or leakage is detected.

**§ 264.575 Closure.**

(a) At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (pad, liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leakage, and manage them as hazardous waste.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator then finds that not all contaminated subsoils can be practicably removed or decontaminated, the owner or operator must close the facility and perform post-closure care in accordance with closure and post-closure care requirements that apply to landfills (§ 264.310). For permitted units, the requirement to have a permit continues throughout the post-closure period. In addition, for the purposes of closure, post-closure, and financial responsibility, such a drip pad is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in Subpart G of this part, and Part 266 of these regulations.

(c)(1) The owner or operator of an existing drip pad, as defined in § 264.570 of this subpart, that does not comply with the liner requirements of § 264.573(b)(1) must:

(i) Include in the closure plan for the drip pad under § 264.112 both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure; and

(ii) Prepare a contingent post-closure plan under § 264.118 of this part for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§ 264.112 and 266.13 of these regulations for closure and post-closure care of a drip pad subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a) of this section.

**§ 264.576 through § 264.599 [Reserved]**

**Subpart X -- Miscellaneous Units**

**§ 264.600 Applicability.**

The requirements in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units, except as § 264.1 provides otherwise.

**§ 264.601 Environmental performance standards.**

A miscellaneous unit must be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. Permits for miscellaneous units are to contain such terms and provisions as necessary to protect human health and the environment, including, but not limited to, as appropriate, design and operating requirements, detection and monitoring requirements, and requirements for responses to releases of hazardous waste or hazardous constituents from the unit. Permit terms and provisions shall include those requirements of Subparts I through O and Subparts AA through CC of this part, Part 100, 40 CFR Part 63, subpart EEE, and 40 CFR 146 that are appropriate for the miscellaneous unit being permitted. Protection of human health and the environment includes, but is not limited to:

(a) Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in the ground water or subsurface environment, considering:

- (1) The volume and physical and chemical characteristics of the waste in the unit, including its potential for migration through soil, liners, or other containing structures;
- (2) The hydrologic and geologic characteristics of the unit and the surrounding area;
- (3) The existing quality of ground water, including other sources of contamination and their cumulative impact on the ground water;
- (4) The quantity and direction of ground-water flow;
- (5) The proximity to and withdrawal rates of current and potential ground-water users;
- (6) The patterns of land use in the region;
- (7) The potential for deposition or migration of waste constituents into subsurface physical structures, and into the root zone of food-chain crops and other vegetation;
- (8) The potential for health risks caused by human exposure to waste constituents; and

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(9) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

(b) Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents in surface water, or wetlands or on the soil surface considering:

(1) The volume and physical and chemical characteristics of the waste in the unit;

(2) The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration;

(3) The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;

(4) The patterns of precipitation in the region;

(5) The quantity, quality, and direction of ground-water flow;

(6) The proximity of the unit to surface waters;

(7) The current and potential uses of nearby surface waters and any water quality standards established for those surface waters;

(8) The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils;

(9) The patterns of land use in the region;

(10) The potential for health risks caused by human exposure to waste constituents; and

(11) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

(c) Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air, considering:

(1) The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;

(2) The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;

(3) The operating characteristics of the unit;

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- (4) The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area;
- (5) The existing quality of the air, including other sources of contamination and the cumulative impact on the air;
- (6) The potential for health risks caused by human exposure to waste constituents; and
- (7) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

**§ 264.602 Monitoring, analysis, inspection, response, reporting, and corrective action.**

Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with §§ 264.601, 264.15, 264.33, 264.75, 264.76, 264.77, and 264.101 as well as meet any additional requirements needed to protect human health and the environment as specified in the permit.

**§ 264.603 Post-closure care.**

A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with § 264.601 during the post-closure care period. A miscellaneous unit that is a disposal unit must also comply with the environmental covenant requirements set forth in § 25-15-317, C.R.S. et. seq. In addition, if a treatment or storage unit has contaminated soils or ground water that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of § 264.601 during post-closure care. The post-closure care plan under § 264.118 must specify the procedures that will be used to satisfy this requirement.

**Subparts Y-Z [Reserved]**

**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, paragraphs (d) and (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 one of the following:

(1) A unit that is subject to the permitting requirements of Part 100, or

(2) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of § 262.34(a) (i.e., a hazardous waste recycling unit that is not a 90-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of Part 100, or

(3) A unit that is exempt from permitting under the provisions of § 262.34(a) (i.e., a “90-day” tank or container) and is not a recycling unit under the provisions of § 261.6 of these regulations..

(c) For the owner and operator of a facility subject to this subpart and who received a final permit under RCRA section 3005 prior to December 6, 1996, the requirements of this subpart shall be incorporated into the permit when the permit is reissued in accordance with the requirements of § 100.511 of these regulations or reviewed in accordance with the requirements of § 100.45(d) of these regulations. Until such date when the owner and operator receives a final permit incorporating the requirements of this subpart, the owner and operator is subject to the requirements of 40 CFR 265, Subpart AA.

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

(d) [Reserved]

(e) The requirements of this subpart do not apply to the process vents at a facility where the facility owner or operator certifies that all of the process vents that would otherwise be subject to this subpart are equipped with and operating air emission controls in accordance with the process vent requirements of an applicable Clean Air Act regulation codified under 40 CFR Part 60, Part 61, or Part 63. The documentation of compliance under regulations at 40 CFR Part 60, Part 61, or Part 63 shall be kept with, or made readily available with, the facility operating record.

**§ 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 through 267.

**"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 or other connector, 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 organic components in the stream is greater than 0.3 kilopascals (kPa) at 20 EC, the total concentration of the pure organic components having a vapor pressure greater than 0.3 kilopascals (kPa) at 20 EC 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 hazardous waste 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.

**"Sampling connection system"** means an assembly of equipment within a process or waste management unit used during periods of representative operation to take samples of the process or waste fluid. Equipment used to take non-routine grab samples is not considered a sampling connection system.

**"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.

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**§ 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 Director 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)(i) 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 30 months after the effective date that the facility becomes subject to this subpart for installation and startup.

(ii) Any unit that begins operation after December 21, 1990, and is subject to the provisions of this subpart when operations begins, must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 30-month implementation schedule does not apply.

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(iii) The owner or operator of any facility in existence on the effective date of a statutory or EPA or state regulatory amendment that renders the facility subject to this subpart shall comply with all requirements of this subpart as soon as practicable but no later than 30 months after the amendment's effective date. When control equipment required by this subpart can not be installed and begin operation by the effective date of the amendment, the facility owner or operator shall prepare an implementation schedule that includes the following information: Specific calendar dates for award of contracts or issuance of purchase orders for the control equipment, initiation of on-site installation of the control equipment, completion of the control equipment installation, and performance of any testing to demonstrate that the installed equipment meets the applicable standards of this subpart. The owner or operator shall enter the implementation schedule in the operating record or in a permanent, readily available file located at the facility.

(iv) Owners and operators of facilities and units that become newly subject to the requirements of this subpart after December 8, 1997, due to an action other than those described in paragraph (a)(2)(iii) of this section must comply with all applicable requirements immediately (i.e., must have control devices installed and operating on the date the facility or unit becomes subject to this subpart; the 30-month implementation schedule does not apply).

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(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 EC. 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.

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(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 EC and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 EC;

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

$C_i$  = 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 EC 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.

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(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:

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  $\nabla 1$  percent of the temperature being monitored in EC or  $\nabla 0.5$  EC, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

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- (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  $\nabla 1$  percent of the temperature being monitored in EC or  $\nabla 0.5$  EC, 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  $\nabla 1$  percent of the temperature being monitored in EC or  $\nabla 0.5$  EC, 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 with an accuracy of  $\nabla 1$  percent of the temperature being monitored in degrees Celsius (EC) or  $\nabla 0.5$  EC, whichever is greater. The temperature sensor shall be installed at a location in the exhaust vent stream from the condenser exit (i.e., product side).
- (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.

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- (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 § 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) A closed-vent system shall meet either of the following design requirements:
- (1) A closed-vent system shall be designed to operate with no detectable emissions, as indicated by an instrument reading of less than 500 ppmv above background as determined by the procedure in § 264.1034(b) of this subpart, and by visual inspections; or

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(2) A closed-vent system shall be designed to operate at a pressure below atmospheric pressure. The system shall be equipped with at least one pressure gauge or other pressure measurement device that can be read from a readily accessible location to verify that negative pressure is being maintained in the closed-vent system when the control device is operating.

(l) The owner or operator shall monitor and inspect each closed-vent system required to comply with this section to ensure proper operation and maintenance of the closed-vent system by implementing the following requirements:

(1) Each closed-vent system that is used to comply with paragraph (k)(1) of this section shall be inspected and monitored in accordance with the following requirements:

(i) An initial leak detection monitoring of the closed-vent system shall be conducted by the owner or operator on or before the date that the system becomes subject to this section. The owner or operator shall monitor the closed-vent system components and connections using the procedures specified in § 264.1034(b) of this subpart to demonstrate that the closed-vent system operates with no detectable emissions, as indicated by an instrument reading of less than 500 ppmv above background.

(ii) After initial leak detection monitoring required in paragraph (l)(1)(i) of this section, the owner or operator shall inspect and monitor the closed-vent system as follows:

(A) Closed-vent system joints, seams, or other connections that are permanently or semi-permanently sealed (e.g., a welded joint between two sections of hard piping or a bolted and gasketed ducting flange) shall be visually inspected at least once per year to check for defects that could result in air pollutant emissions. The owner or operator shall monitor a component or connection using the procedures specified in § 264.1034(b) of this subpart to demonstrate that it operates with no detectable emissions following any time the component is repaired or replaced (e.g., a section of damaged hard piping is replaced with new hard piping) or the connection is unsealed (e.g., a flange is unbolted).

(B) Closed-vent system components or connections other than those specified in paragraph (l)(1)(ii)(A) of this section shall be monitored annually and at other times as requested by the Director, except as provided for in paragraph (o) of this section, using the procedures specified in § 264.1034(b) of this subpart to demonstrate that the components or connections operate with no detectable emissions.

(iii) In the event that a defect or leak is detected, the owner or operator shall repair the defect or leak in accordance with the requirements of paragraph (l)(3) of this section.

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(iv) The owner or operator shall maintain a record of the inspection and monitoring in accordance with the requirements specified in § 264.1035 of this subpart.

(2) Each closed-vent system that is used to comply with paragraph (k)(2) of this section shall be inspected and monitored in accordance with the following requirements:

(i) The closed-vent system shall be visually inspected by the owner or operator to check for defects that could result in air pollutant emissions. Defects include, but are not limited to, visible cracks, holes, or gaps in ductwork or piping or loose connections.

(ii) The owner or operator shall perform an initial inspection of the closed-vent system on or before the date that the system becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year.

(iii) In the event that a defect or leak is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (1)(3) of this section.

(iv) The owner or operator shall maintain a record of the inspection and monitoring in accordance with the requirements specified in § 264.1035 of this subpart.

(3) The owner or operator shall repair all detected defects as follows:

(i) Detectable emissions, as indicated by visual inspection, or by an instrument reading greater than 500 ppmv above background, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected, except as provided for in paragraph (1)(3)(iii) of this section.

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

(iii) Delay of repair of a closed-vent system for which leaks have been detected is allowed if the repair is technically infeasible without a process unit shutdown, or if the owner or operator determines that emissions resulting from immediate repair would be greater than the fugitive emissions likely to result from delay of repair. Repair of such equipment shall be completed by the end of the next process unit shutdown.

(iv) The owner or operator shall maintain a record of the defect repair in accordance with the requirements specified in § 264.1035 of this subpart.

(m) 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.

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(n) The owner or operator using a carbon adsorption system to control air pollutant emissions shall document that all carbon that is a hazardous waste and that is removed from the control device is managed in one of the following manners, regardless of the average volatile organic concentration of the carbon:

(1) Regenerated or reactivated in a thermal treatment unit that meets one of the following:

(i) The owner or operator of the unit has been issued a final permit under Part 100 of these regulations which implements the requirements of Subpart X of this part; or

(ii) The unit is equipped with and operating air emission controls in accordance with the applicable requirements of Subparts AA and CC of either of this part or of Part 265 of these regulations; or

(iii) The unit is equipped with and operating air emission controls in accordance with a national emission standard for hazardous air pollutants under 40 CFR Part 61 or 40 CFR Part 63.

(2) Incinerated in a hazardous waste incinerator for which the owner or operator either:

(i) Has been issued a final permit under Part 100 of these regulations which implement the requirements of Subpart O of this part; or

(ii) Has designed and operates the incinerator in accordance with the interim status requirements of Part 265, Subpart O.

(3) Burned in a boiler or industrial furnace for which the owner or operator either:

(i) Has been issued a final permit under Part 100 of these regulations which implements the requirements of Subpart O of this part; or

(ii) Has designed and operates the boiler or industrial furnace in accordance with the interim status requirements of Part 265, Subpart H of these regulations.

(o) Any components of a closed-vent system that are designated, as described in § 264.1035(c)(9) of this subpart, as unsafe to monitor are exempt from the requirements of paragraph (l)(1)(ii)(B) of this section if:

(1) The owner or operator of the closed-vent system determines that the components of the closed-vent system are unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (l)(1)(ii)(B) of this section; and

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(2) The owner or operator of the closed-vent system adheres to a written plan that requires monitoring the closed-vent system components using the procedure specified in paragraph (1)(1)(ii)(B) of this section as frequently as practicable during safe-to-monitor times.

**§ 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(1) of this subpart, 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.

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- (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 or Method 25A in 40 CFR Part 60, Appendix A, for organic content. If Method 25A is used, the organic HAP used as the calibration gas must be the single organic HAP representing the largest percent by volume of the emissions. The use of Method 25A is acceptable if the response from the high-level calibration gas is at least 20 times the standard deviation of the response from the zero calibration gas when the instrument is zeroed on the most sensitive scale.
    - (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:

(A) For sources utilizing Method 18.

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

where:

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

$Q_{2sd}$  = 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<sup>3</sup> (@ 293 K and 760 mm Hg);

10<sup>-6</sup> = Conversion from ppm.

(B) For sources utilizing Method 25A.

$$E_h = (Q)(C)(MW)[0.0416][10^{-6}]$$

where:

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

$Q$  = Volumetric flow rate of gases entering or exiting control device, as determined by Method 2, dscm/h;

$C$  = Organic concentration in ppm, dry basis, as determined by Method 25A;

$MW$  = Molecular weight of propane, 44;

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

$10^{-6}$  = Conversion from ppm.

(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.

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(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 Director'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.

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(iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060A (incorporated by reference under § 260.11) of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, or analyzed for its individual organic constituents.

(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 Director 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 dispute may be resolved by using direct measurement as specified at paragraph (d)(1) of this section.

**§ 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.

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(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 Director 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.

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(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.

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(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 760EC period when the combustion temperature is below 760 EC.

(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 EC below the design average combustion zone temperature established as a requirement of paragraph (b)(4)(iii)(A) of this section.

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

(A) Temperature of the vent stream at the catalyst bed inlet is more than 28 EC 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 EC 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 EC 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 EC 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.

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(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.

(9) An owner or operator designating any components of a closed-vent system as unsafe to monitor pursuant to § 264.1033(o) of this subpart shall record in a log that is kept in the facility operating record the identification of closed-vent system components that are designated as unsafe to monitor in accordance with the requirements of § 264.1033(o) of this subpart, an explanation for each closed-vent system component stating why the closed-vent system component is unsafe to monitor, and the plan for monitoring each closed-vent system component.

(10) When each leak is detected as specified in § 264.1033(l) of this subpart, the following information shall be recorded:

(i) The instrument identification number, the closed-vent system component identification number, and the operator name, initials, or identification number.

(ii) The date the leak was detected and the date of first attempt to repair the leak.

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

(iv) Maximum instrument reading measured by Method 21 of 40 CFR Part 60, Appendix A after it is successfully repaired or determined to be nonrepairable.

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

(A) The owner or operator may develop a written procedure that identifies the conditions that justify a delay of repair. In such cases, reasons for delay of repair may be documented by citing the relevant sections of the written procedure.

(B) If delay of repair was caused by depletion of stocked parts, there must be documentation that the spare parts were sufficiently stocked on-site before depletion and the reason for depletion.

(d) Records of the monitoring, operating, and inspection information required by paragraphs (c)(3) through (c)(10) of this section shall be maintained by the owner or operator for at least three years following the date of each occurrence, measurement, maintenance, corrective action, or record.

(e) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, the Director 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.

**§ 264.1036 Reporting requirements.**

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Director by dates specified by the Director. 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.

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(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 Director is not required.

**§§ 264.1037 -- 264.1049 [Reserved]**

**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 one of the following:

(1) A unit that is subject to the permitting requirements of Part 100, or

(2) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of § 262.34(a) (i.e., a hazardous waste recycling unit that is not a "90-day" tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of Part 100.

(3) A unit that is exempt from permitting under the provisions of § 262.34(a) (i.e., a "90-day" tank or container) and is not a recycling unit under the provisions of § 261.6 of these regulations.

(c) For the owner or operator of a facility subject to this subpart and who received a final permit under RCRA section 3005 prior to December 6, 1996, the requirements of this subpart shall be incorporated into the permit when the permit is reissued in accordance with the requirements of § 100.511 of these regulations or reviewed in accordance with the requirements of § 100.45(d) of these regulations. Until such date when the owner and operator receives a final permit incorporating the requirements of this subpart, the owner and operator is subject to the requirements of 40 CFR 265, Subpart BB.

(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).

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(f) Equipment that contains or contacts hazardous waste with an organic concentration of at least 10 percent by weight for less than 300 hours per calendar year is excluded from the requirements of §§ 264.1052 through 264.1060 of this subpart if it is identified, as required in § 264.1064(g)(6) of this subpart.

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 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 through 267.

### § 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 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 § 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

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(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 Director.

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(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.

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(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 Director.

### § 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.

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**§ 264.1055 Standards: Sampling connecting systems.**

(a) Each sampling connection system shall be equipped with a closed purge, closed-loop, or closed-vent system. This system shall collect the sample purge for return to the process or for routing to the appropriate treatment system. Gases displaced during filling of the sample container are not required to be collected or captured.

(b) Each closed-purge, closed-loop, or closed-vent system as required in paragraph (a) of this section shall meet one of the following requirements:

(1) Return the purged process fluid directly to the process line;

(2) Collect and recycle the purged process fluid; or

(3) Be designed and operated to capture and transport all the purged process fluid to a waste management unit that complies with the applicable requirements of § 264.1084 through § 264.1086 of this subpart or a control device that complies with the requirements of § 264.1060 of this subpart.

(c) In situ sampling systems and sampling systems without purges 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.

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- (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 Director.
- (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.

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(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).

(e) Any connector that is inaccessible or is ceramic or ceramic-lined (e.g., porcelain, glass, or glass-lined) is exempt from the monitoring requirements of paragraph (a) of this section and from the recordkeeping requirements of § 264.1064 of this subpart.

**§ 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.

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(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 affected, 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.**

(a) Owners and operators of closed-vent systems and control devices subject to this subpart shall comply with the provisions of § 264.1033 of this part.

(b)(1) 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 30 months after the effective date that the facility becomes subject to this subpart for installation and startup.

(2) Any unit that begins operation after December 21, 1990, and is subject to the provisions of this subpart when operation begins, must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 30-month implementation schedule does not apply.

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(3) The owner or operator of any facility in existence on the effective date of a statutory or EPA regulatory amendment that renders the facility subject to this subpart shall comply with all requirements of this subpart as soon as practicable but no later than 30 months after the amendment's effective date. When control equipment required by this subpart can not be installed and begin operation by the effective date of the amendment, the facility owner or operator shall prepare an implementation schedule that includes the following information: Specific calendar dates for award or contracts or issuance of purchase orders for the control equipment, initiation of on-site installation of the control equipment, completion of the control equipment installation, and performance of any testing to demonstrate that the installed equipment meets the applicable standards of this subpart. The owner or operator shall enter the implementation schedule in the operating record or in a permanent, readily available file located at the facility.

(4) Owners and operators of facilities and units that become newly subject to the requirements of this subpart after December 8, 1997, due to an action other than those described in paragraph (b)(3) of this section must comply with all applicable requirements immediately (i.e., must have control devices installed and operating on the date the facility or unit becomes subject to this subpart; the 30-month implementation schedule does not apply).

**§ 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.

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(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) 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 Director.

(2) 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.

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

(a) 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.

(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.

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(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 (i.e., monitor for leaks once every six months) for the valves subject to the requirements in § 264.1057 of this subpart.

(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 (i.e., monitor for leaks once every year) for the valves subject to the requirements in § 264.1057 of this subpart.

(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).

#### § 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 through 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.

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(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 9060A (incorporated by reference under § 260.11) of "Test Methods for Evaluating Solid Waste," EPA Publication SW-846, for computing total organic concentration of the sample, or analyzed for its individual organic constituents; 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 Director 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.

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(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).

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- (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).

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(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) through (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 Director 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.

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- (6) Identification, either by list or location (area or group) of equipment that contains or contacts hazardous waste with an organic concentration of at least 10 percent by weight for less than 300 hours per calendar year.
- (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.

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(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 a facility with equipment that is subject to this subpart and to regulations at 40 CFR Part 60, Part 61, or Part 63 may elect to determine compliance with this subpart either by documentation pursuant to § 264.1064 of this subpart, or by documentation of compliance with the regulations at 40 CFR Part 60, Part 61, or Part 63 pursuant to the relevant provisions of the regulations at 40 CFR Part 60, Part 61, or Part 63. The documentation of compliance under the regulations at 40 CFR Part 60, Part 61, or Part 63 shall be kept with or made readily available with the facility operating record.

### **§ 264.1065 Reporting requirements.**

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Director by dates specified by the Director. 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).

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- (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 Director is not required.

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**Subpart DD -- Containment Buildings**

**§ 264.1100 Applicability.**

The requirements of this subpart apply to owners or operators who store or treat hazardous waste in units designed and operated under § 264.1101 of this subpart. The owner or operator is not subject to the definition of land disposal in RCRA section 3004(k) provided that the unit:

- (a) Is a completely enclosed, self-supporting structure that is designed and constructed of manmade materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed; climatic conditions; and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls;
- (b) Has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel, wastes, and handling equipment within the unit;
- (c) If the unit is used to manage liquids, has:
  - (1) A primary barrier designed and constructed of materials to prevent migration of hazardous constituents into the barrier;
  - (2) A liquid collection system designed and constructed of materials to minimize the accumulation of liquid on the primary barrier; and
  - (3) A secondary containment system designed and constructed of materials to prevent migration of hazardous constituents into the barrier, with a leak detection and liquid collection system capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time, unless the unit has been granted a variance from the secondary containment system requirements under § 264.1101(b)(4);
- (d) Has controls sufficient to prevent fugitive dust emissions to meet the no visible emission standard in § 264.1101(c)(1)(iv); and
- (e) Is designed and operated to ensure containment and prevent the tracking of materials from the unit by personnel or equipment.

**§ 264.1101 Design and operating standards.**

(a) All containment buildings must comply with the following design standards:

(1) The containment building must be completely enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, run-on), and to assure containment of managed wastes.

(2) The floor and containment walls of the unit, including the secondary containment system if required under paragraph (b) of this section, must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed; climatic conditions; and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls. The unit must be designed so that it has sufficient structural strength to prevent collapse or other failure. All surfaces to be in contact with hazardous wastes must be chemically compatible with those wastes. The Department will consider standards established by professional organizations generally recognized by the industry such as the American Concrete Institute (ACI) and the American Society of Testing Materials (ASTM) in judging the structural integrity requirements of this paragraph. If appropriate to the nature of the waste management operation to take place in the unit, an exception to the structural strength requirement may be made for light-weight doors and windows that meet these criteria:

(i) They provide an effective barrier against fugitive dust emissions under paragraph (c)(1)(iv); and

(ii) The unit is designed and operated in a fashion that assures that wastes will not actually come in contact with these openings.

(3) Incompatible hazardous wastes or treatment reagents must not be placed in the unit or its secondary containment system if they could cause the unit or secondary containment system to leak, corrode, or otherwise fail.

(4) A containment building must have a primary barrier designed to withstand the movement of personnel, waste, and handling equipment in the unit during the operating life of the unit and appropriate for the physical and chemical characteristics of the waste to be managed.

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(b) For a containment building used to manage hazardous wastes containing free liquids or treated with free liquids (the presence of which is determined by the paint filter test, a visual examination, or other appropriate means), the owner or operator must include:

(1) A primary barrier designed and constructed of materials to prevent the migration of hazardous constituents into the barrier (e.g., a geomembrane covered by a concrete wear surface).

(2) A liquid collection and removal system to minimize the accumulation of liquid on the primary barrier of the containment building:

(i) The primary barrier must be sloped to drain liquids to the associated collection system; and

(ii) Liquids and waste must be collected and removed to minimize hydraulic head on the containment system at the earliest practicable time.

(3) A secondary containment system including a secondary barrier designed and constructed to prevent migration of hazardous constituents into the barrier, and a leak detection system that is capable of detecting failure of the primary barrier and collecting accumulated hazardous wastes and liquids at the earliest practicable time.

(i) The requirements of the leak detection component of the secondary containment system are satisfied by installation of a system that is, at a minimum:

(A) Constructed with a bottom slope of 1 percent or more; and

(B) Constructed of a granular drainage material with a hydraulic conductivity of  $1 \times 10^{-2}$  cm/sec or more and a thickness of 12 inches (30.5 cm) or more, or constructed of synthetic or geonet drainage materials with a transmissivity of  $3 \times 10^{-5}$  m<sup>2</sup>/sec or more.

(ii) If treatment is to be conducted in the building, an area in which such treatment will be conducted must be designed to prevent the release of liquids, wet materials, or liquid aerosols to other portions of the building.

(iii) The secondary containment system must be constructed of materials that are chemically resistant to the waste and liquids managed in the containment building and of sufficient strength and thickness to prevent collapse under the pressure exerted by overlying materials and by any equipment used in the containment building. (Containment buildings can serve as secondary containment systems for tanks placed within the building under certain conditions. A containment building can serve as an external liner system for a tank, provided it meets the requirements of § 264.193(e)(1). In addition, the containment building must meet the requirements of § 264.193(b) and §§ 264.193(c) (1) and (2) to be considered an acceptable secondary containment system for a tank.)

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(4) The State shall recognize any delay granted to existing units, other than 90-day generator units, that received approval from EPA by meeting the requirements of 40 CFR 264.1101(b)(4).

(c) Owners or operators of all containment buildings must:

(1) Use controls and practices to ensure containment of the hazardous waste within the unit; and, at a minimum:

(i) Maintain the primary barrier to be free of significant cracks, gaps, corrosion, or other deterioration that could cause hazardous waste to be released from the primary barrier;

(ii) Maintain the level of the stored/treated hazardous waste within the containment walls of the unit so that the height of any containment wall is not exceeded;

(iii) Take measures to prevent the tracking of hazardous waste out of the unit by personnel or by equipment used in handling the waste. An area must be designated to decontaminate equipment and any rinsate must be collected and properly managed; and

(iv) Take measures to control fugitive dust emissions such that any openings (doors, windows, vents, cracks, etc.) exhibit no visible emissions (see 40 CFR Part 60, Appendix A, Method 22-Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares). In addition, all associated particulate collection devices (e.g., fabric filter, electrostatic precipitator) must be operated and maintained with sound air pollution control practices (see 40 CFR Part 60 Subpart 292 for guidance). This state of no visible emissions must be maintained effectively at all times during routine operating and maintenance conditions, including when vehicles and personnel are entering and exiting the unit.

(2) Obtain certification by a qualified registered professional engineer that the containment building design meets the requirements of paragraphs (a) through (c) of this section. For units placed into operation prior to February 18, 1993, this certification must be placed in the facility's operating record (on-site files for generators who are not formally required to have operating records) no later than 60 days after the date of initial operation of the unit. After February 18, 1993, PE certification will be required prior to operation of the unit.

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(3) Throughout the active life of the containment building, if the owner or operator detects a condition that could lead to or has caused a release of hazardous waste, must repair the condition promptly, in accordance with the following procedures:

(i) Upon detection of a condition that has led to a release of hazardous waste (e.g., upon detection of leakage from the primary barrier) the owner or operator must:

(A) Enter a record of the discovery in the facility operating record;

(B) Immediately remove the portion of the containment building affected by the condition from service;

(C) Determine what steps must be taken to repair the containment building, remove any leakage from the secondary collection system, and establish a schedule for accomplishing the cleanup and repairs; and

(D) Within 7 days after the discovery of the condition, notify the Director of the condition, and within 14 working days, provide a written notice to the Director with a description of the steps taken to repair the containment building, and the schedule for accomplishing the work.

(ii) The Director will review the information submitted, make a determination regarding whether the containment building must be removed from service completely or partially until repairs and cleanup are complete, and notify the owner or operator of the determination and the underlying rationale in writing.

(iii) Upon completing all repairs and cleanup the owner or operator must notify the Director in writing and provide a verification, signed by a qualified, registered professional engineer, that the repairs and cleanup have been completed according to the written plan submitted in accordance with paragraph (c)(3)(i)(D) of this section.

(4) Inspect and record in the facility's operating record, at least once every seven days, data gathered from monitoring equipment and leak detection equipment as well as the containment building and the area immediately surrounding the containment building to detect signs of releases of hazardous waste.

(d) For containment buildings that contain areas both with and without secondary containment, the owner or operator must:

(1) Design and operate each area in accordance with the requirements enumerated in paragraphs (a) through (c) of this section;

(2) Take measures to prevent the release of liquids or wet materials into areas without secondary containment; and

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(3) Maintain in the facility's operating log a written description of the operating procedures used to maintain the integrity of areas without secondary containment.

(e) Notwithstanding any other provision of this subpart the Director may waive requirements for secondary containment for a permitted containment building where the owner operator demonstrates that the only free liquids in the unit are limited amounts of dust suppression liquids required to meet occupational health and safety requirements, and where containment of managed wastes and liquids can be assured without a secondary containment system.

**§ 264.1102 Closure and post-closure care.**

(a) At closure of a containment building, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leachate, and manage them as hazardous waste unless § 261.3(d) of these regulations applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for containment buildings must meet all of the requirements specified in Subpart G of this part, and the requirements of Part 266 of these regulations.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated subsoils can be practicably removed or decontaminated, the owner or operator must close the facility and perform post-closure care in accordance with the closure and post-closure requirements that apply to landfills (§ 264.310). In addition, for the purposes of closure, post-closure, and financial responsibility, such a containment building is then considered to be a landfill, and the owner or operator must meet all of the requirements for landfills specified in Subpart G of this part, and the requirements of Part 266 of these regulations.

**§§ 264.1103 through 264.1110 [Reserved]**

**INSERT APPENDIX.264 HERE**