

**61-79.265. INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF
HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES.**

SUBPART A
General

265.1. Purpose, scope, and applicability.

(a) The purpose of this part is to establish minimum national standards that define the acceptable management of hazardous waste during the period of interim status and until certification of final closure or, if the facility is subject to postclosure requirements, until postclosure responsibilities are fulfilled.

(b) Except as provided in 265.1080(b), the standards of this part, and of 264.552, 264.553 and 264.554, apply to owners and operators of facilities that treat, store or dispose of hazardous waste who have fully complied with the requirements for interim status under 44-56-60 and section 3005(e) of RCRA and 270.70 until either a permit is issued under 44-56-60 and section 3005 of RCRA or until applicable part 265 closure and postclosure responsibilities are fulfilled, and to those owners and operators of facilities in existence on November 19, 1980 who have failed to provide timely notification as required under section 44-56-120 of the 1976 Code of Laws of South Carolina and by section 3010(a) of RCRA, as amended, and/or failed to file part A of the permit application as required by 270.10 (e) and (g). These standards apply to all treatment, storage and disposal of hazardous waste at these facilities after the effective date of these regulations, except as specifically provided otherwise in this part or part 261. (12/92; 12/93; 9/98)

[Comment: As stated in § 44-56-60 and section 3005(a) of RCRA, after the effective date of regulations under that section (i.e., parts 270 and 124 of this chapter), the treatment, storage and disposal of hazardous waste is prohibited except in accordance with a permit. § 44-56-50 and Section 3005(e) of RCRA provides for the continued operation of an existing facility that meets certain conditions, until final administrative disposition of the owner's and operator's permit application is made.] (revised 12/92)

(c) The requirements of this part do not apply to:

(1) A person disposing of hazardous waste by means of ocean disposal subject to a permit issued under the Marine Protection, Research, and Sanctuaries Act.

[Comment: These part 265 regulations do apply to the treatment or storage of hazardous waste before it is loaded onto an ocean vessel for incineration or disposal at sea, as provided in paragraph (b).]

(2) [Reserved 5/96]

(3) The owner or operator of a POTW which treats, stores, or disposed of hazardous waste;

[Comment: The owner or operator of a facility under paragraphs (c)(1) through (3) of this section is subject to the requirements of part 264 of this chapter to the extent they are included in a permit by rule granted to such a person under R.61-79.270.]

(4) [Reserved]

(5) The owner or operator of a facility permitted, licensed, or registered by a State to manage municipal or industrial solid waste, if the only hazardous waste the facility treats, stores, or disposes of is excluded from regulation under this part by R.61-79.262.14;

(6) The owner and operator of a facility managing recyclable materials described in 261.6 (a)(2), (3), and (4) (except to the extent they are referred to in subparts C, F, G, or H of part 266). (revised 5/96)

(7) A generator accumulating waste onsite in compliance with applicable conditions for exemption in R.61-79.262.14 through 262.17, and R.61-79.262 subparts K and L, except to the extent the requirements of R.61-79.265 are included in those sections and subparts;

(8) A farmer disposing of waste pesticides from his own use in compliance with section 262.70; or

(9) The owner or operator of a totally enclosed treatment facility, as defined in Section 260.10.

(10) The owner or operator of an elementary neutralization unit or a wastewater treatment unit as defined in 260.10 of these regulations, provided that if the owner or operator is diluting hazardous ignitable (D001) wastes (other than the D001 High TOC Subcategory defined in 268.40, Table Treatment Standards for Hazardous Wastes), or reactive (D003) waste, to remove the characteristic before land disposal, the owner/operator must comply with the requirements set out in 265.17(b). (revised 12/93; 5/96)

(11)

(i) Except as provided in paragraph (c)(11)(ii) of this section, a person engaged in treatment or containment activities during immediate response to any of the following situations: (revised 12/93)

(A) A discharge of a hazardous waste;

(B) An imminent and substantial threat of a discharge of a hazardous waste;

(C) A discharge of a material which, when discharged, becomes a hazardous waste.

(D) An immediate threat to human health, public safety, property, or the environment, from the known or suspected presence of military munitions, other explosive material, or an explosive device, as determined by an explosive or munitions emergency response specialist as defined in 260.10.

(ii) An owner or operator of a facility otherwise regulated by this part must comply with all applicable requirements of subparts C and D below.

(iii) Any person who is covered by paragraph (c)(11)(i) of this section and who continues or initiates hazardous waste treatment or containment activities after the immediate response is over is subject to all applicable requirements of this part and R.61-79.270 and .124 for those activities.

(iv) In the case of an explosives or munitions emergency response, if a Federal, State, Tribal or local official acting within the scope of his or her official responsibilities, or an explosives or munitions emergency response specialist, determines that immediate removal of the material or waste is necessary to protect human health or the environment, that official or specialist may authorize the removal of the material or waste by transporters who do not have EPA identification numbers and without the preparation of a manifest. In the case of emergencies involving military munitions, the responding military emergency response specialist's organizational unit must retain records for three years identifying the dates of the response, the responsible persons responding, the type and description of material addressed, and its disposition.

(12) A transporter storing manifested shipments of hazardous waste in containers meeting the requirements of R.61-79.262.30 at a transfer facility for a period of ten days or less.

(13) The addition of absorbent material to waste in a container (as defined in R.61-79.260.10 or the addition of waste to the absorbent material in a container provided that these actions occur at the time waste is first placed in the containers; and R.61-79.265.17(b), and Subpart I Sections 265.171 and 265.172 are complied with.

(14) Universal waste handlers and universal waste transporters (as defined in R.61-79.260.10) handling the wastes listed below. These handlers are subject to regulation under R.61-79.273, when handling the below listed universal wastes.

(i) Batteries as described in 273.2;

(ii) Pesticides as described in 273.3;

(iii) Mercury-containing equipment as described in 273.4;

(iv) Lamps as described in 273.5; and

(v) Aerosol cans as described in 273.6 of this chapter.

(15) [Reserved]

(16) Reverse distributors accumulating potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals, as defined in Section 266.500. Reverse distributors are subject to regulation under part 266, subpart P in lieu of this part for the accumulation of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals.

(d) The following hazardous wastes must not be managed at facilities subject to regulation under this Regulation.

(1) EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027 unless:

(i) The wastewater treatment sludge is generated in a surface impoundment as part of the plant's wastewater treatment system;

(ii) The waste is stored in tanks or containers;

(iii) The waste is stored or treated in waste piles that meet the requirements of R.61-79.264.250(c) as well as all other applicable requirements of Subpart L of this Regulation;

(iv) The waste is burned in incinerators that are certified pursuant to the standards and procedures in Subpart O Section 265.352; or

(v) The waste is burned in facilities that thermally treat the waste in a device other than an incinerator and that are certified pursuant to the standards and procedures in Subpart P Section 265.383.

(e) The requirements of this part apply to owners or operators of all facilities which treat, store or dispose of hazardous waste referred to in part 268 and the part 268 standards are considered material conditions or requirements of the part 265 interim status standards. (amended 11/90)

(f) Section 266.205 of this chapter identifies when the requirements of this part apply to the storage of military munitions classified as solid waste under 266.202 of this chapter. The treatment and disposal of hazardous waste military munitions are subject to the applicable permitting, procedural, and technical standards in parts 260 through 270.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 44-11 Doc. No. 4976, eff November 27, 2020; SCSR 45-5 Doc. No. 4975, eff May 28, 2021; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

265.4. Imminent hazard action.

Notwithstanding any other provision of these regulations, enforcement actions may be brought pursuant to Section 44-56-50 of the S.C. Code of Laws of 1976 as amended and section 7003 of RCRA.

265.5. Notification requirements upon owners and operators of hazardous waste facilities.

(a) Any person who owns or operates a facility within the state which treats, stores, or disposes of a hazardous waste and has not previously done so shall file a completed Site Identification Form with the Department within thirty (30) days of the effective date of this regulation.

(b) Any person who plans to construct a new facility to treat, store, or dispose of hazardous waste shall file a completed Site Identification Form with the Department as part of the permit application.

(c) Any person who owns or operates a facility which treats, stores, or disposes of a hazardous waste which is classified or listed for the first time by a revision of R.61-79.261 shall file a revised or new Site Identification Form for that waste with the Department within ninety (90) days after the effective date of such revision.

HISTORY: Adopted by State Register Volume 10, Issue No. 1, eff January 24, 1986. Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

SUBPART B ***General Facility Standards***

265.10. Applicability.

The regulations in this subpart apply to owners and operators of all hazardous waste facilities, except as Section 265.1 provides otherwise.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.11. Identification Number.

Every facility owner or operator must apply to the Department for an identification number in accordance with the Department notification requirements of R.61-79.264.11.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.12. Required notices.

(a) The owner or operator of a facility that is arranging or has arranged to receive hazardous waste subject to part 262 subpart H from a foreign source must submit the following required notices:

(1) As per section 262.84(b), for imports where the competent authority of the country of export does not require the foreign exporter to submit to it a notification proposing export and obtain consent from EPA and the competent authorities for the countries of transit, such owner or operator of the facility, if acting as the importer, must provide notification of the proposed transboundary movement in English to EPA using the allowable methods listed in section 262.84(b)(1) at least sixty (60) days before the first shipment is expected to depart the country of export. The notification may cover up to one (1) year of shipments of wastes having similar physical and chemical characteristics, the same United Nations classification, the same RCRA waste codes and OECD waste codes, and being sent from the same foreign exporter.

(2) As per section 262.84(d)(2)(xv), a copy of the movement document bearing all required signatures within three (3) working days of receipt of the shipment to the foreign exporter; to the competent authorities of the countries of export and transit that control the shipment as an export and transit shipment of hazardous waste respectively; and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's WIETS, or its successor system. The original of the signed movement document must be maintained at the facility for at least three (3) years. The owner or operator of a facility may satisfy this recordkeeping requirement by retaining electronically submitted documents in the facility's account on WIETS, or its successor system, provided that copies are readily available for viewing and production if requested by any EPA or authorized state inspector. No owner or operator of a facility may be held liable for the inability to produce the documents for inspection under this section if the owner or operator of a facility can demonstrate that the inability to produce the document is due exclusively to technical difficulty with WIETS, or its successor system, for which the owner or operator of a facility bears no responsibility.

(3) As per section 262.84(f)(4), if the facility has physical control of the waste and it must be sent to an alternate facility or returned to the country of export, such owner or operator of the facility must inform EPA, using the allowable methods listed in section 262.84(b)(1) of the need to return or arrange alternate management of the shipment.

(4) As per section 262.84(g), such owner or operator shall:

(i) Send copies of the signed and dated confirmation of recovery or disposal, as soon as possible, but no later than thirty (30) days after completing recovery or disposal on the waste in the shipment and no later than one (1) calendar year following receipt of the waste, to the foreign exporter, to the competent authority of the country of export that controls the shipment as an export of hazardous waste, and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's WIETS, or its successor system.

(ii) If the facility performed any of recovery operations R12, R13, or RC16, or disposal operations D13 through D15, or DC17, promptly send copies of the confirmation of recovery or disposal that it receives from the final recovery or disposal facility within one (1) year of shipment delivery to the final recovery or disposal facility that performed one of recovery operations R1 through R11, or RC16, or one of disposal operations D1 through D12, or DC15 to DC16, to the competent authority of the country of export that controls the shipment as an export of hazardous waste, and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's WIETS, or its successor system. The recovery and disposal operations in this paragraph are defined in section 262.81.

(b) Before transferring ownership or operation of a facility during its operating life, or of a disposal facility during the postclosure care period, the owner or operator must notify the new owner or operator in writing of the requirements of this part and part 270. (also see 270.72)

[Comment: An owner's or operator's failure to notify the new owner or operator of the requirements of this part in no way relieves the new owner or operator of his obligation to comply with all applicable requirements.]

(c) [Reserved]

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

265.13. General waste analysis.

(a)(1) Before an owner or operator treats, stores, or disposes of any hazardous wastes, or non-hazardous wastes if applicable under Section 265.113(d), he must obtain a detailed chemical and physical analysis of a representative sample of the wastes. At a minimum, this analysis must contain all the information which must be known to treat, store, or dispose of the waste in accordance with the requirements of this Part and Part 268.

(2) The analysis may include data developed under part 261, and existing published or documented data on the hazardous waste or on waste generated from similar processes.

[Comment: For example, the facility's records of analyses performed on the waste before the effective date of these regulations, or studies conducted on the hazardous waste generated from processes similar to that which generated the waste to be managed at the facility, may be included in the data base required to comply with paragraph (a)(1) of this section. The owner or operator of an offsite facility may arrange for the generator of the hazardous waste to supply part or all of the information required by paragraph (a)(1) of this section, except as otherwise specified in 268.7 (b) and (c) [waste assessment by treatment facilities]. If the generator does not supply the information, and the owner or operator chooses to accept a hazardous waste, the owner or operator is responsible for obtaining the information required to comply with this section.]

(3) The analysis must be repeated as necessary to ensure that it is accurate and up to date. At a minimum, the analysis must be repeated:

(i) When the owner or operator is notified, or has reason to believe, that the process or operation generating the hazardous wastes or nonhazardous wastes, if applicable, under 265.113(d) has changed; and

(ii) For offsite facilities, when the results of the inspection required in paragraph (a)(4) of this Section indicate that the hazardous waste received at the facility does not match the waste designated on the accompanying manifest or shipping paper.

(4) The owner or operator of an offsite facility must inspect and, if necessary, analyze each hazardous waste movement received at the facility to determine whether it matches the identity of the waste specified on the accompanying manifest or shipping paper.

(b) The owner or operator must develop and follow a written waste analysis plan which describes the procedures which he will carry out to comply with paragraph (a) of this Section. He must keep this plan at the facility. At a minimum, the plan must specify:

(1) The parameters for which each hazardous waste or non-hazardous waste if applicable under 265.113(d) will be analyzed and the rationale for the selection of these parameters (i.e., how analysis for these parameters will provide sufficient information on the waste's properties to comply with paragraph (a) above);

(2) The test methods which will be used to test for these parameters;

(3) The sampling method which will be used to obtain a representative sample of the waste to be analyzed. A representative sample may be obtained using either:

(i) One of the sampling methods described in Appendix I of R.61-79.261; or

(ii) An equivalent sampling method.

[Comment: See 260.20(c) of this chapter for related discussion.]

(4) The frequency with which the initial analysis of the waste will be reviewed or repeated to ensure that the analysis is accurate and up to date;

(5) For off-site facilities, the waste analyses that hazardous waste generators have agreed to supply; and

(6) Where applicable, the methods that will be used to meet the additional waste analysis requirements for specific waste management methods as specified in 265.200, 265.225, 265.252, 265.273, 265.314, 265.341, 265.375, 265.402, 265.1034(d), 265.1063(d), 265.1084, and 268.7 of these regulations.

(7) For surface impoundments exempted from land disposal restrictions under 268.4(a) of this chapter, the procedures and schedule for:

(i) The sampling of impoundment contents;

(ii) The analysis of test data; and,

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

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

(B) Where no treatment standards have been established;

(1) Such residues are prohibited from land disposal under 268.32 or RCRA section 3004(d); or

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

(8) For owners and operators seeking an exemption to the air emission standards of Subpart CC of this part in accordance with 265.1083-

(i) If direct measurement is used for the waste determination, the procedures and schedules for waste sampling and analysis, and the results of the analysis of test data to verify the exemption.

(ii) If knowledge of the waste is used for the waste determination, any information prepared by the facility owner or operator or by the generator of the hazardous waste, if the waste is received from off-site, that is used as the basis for knowledge of the waste.

(c) For offsite facilities, the waste analysis plan required in paragraph (b) above must also specify the procedures which will be used to inspect and, if necessary, analyze each movement of hazardous waste received at the facility to ensure that it matches the identity of the waste designated on the accompanying manifest or shipping paper. At a minimum, the plan must describe:

(1) The procedures which will be used to determine the identity of each movement of waste managed at the facility; and,

(2) The sampling method which will be used to obtain a representative sample of the waste to be identified, if the identification method includes sampling.

(3) The procedures that the owner or operator of an off-site landfill receiving containerized hazardous waste will use to determine whether a hazardous waste generator or treater has added a biodegradable sorbent to the waste in the container.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.14. Security.

(a) The owner or operator must prevent the unknowing entry, and minimize the possibility for the unauthorized entry, of persons or livestock onto the active portion of his facility unless:

(1) Physical contact with the waste, structures, or equipment within the active portion of the facility will not injure unknowing or unauthorized persons or livestock which may enter the active portion of a facility; and

(2) Disturbance of the waste or equipment, by the unknowing or unauthorized entry of persons or livestock onto the active portion of a facility, will not cause a violation of the requirements of this regulation.

(b) Unless exempt under paragraphs (a)(1) and (2) of this section, a facility must have:

(1) A 24-hour surveillance system (e.g., television monitoring or surveillance by guards or facility personnel) which continuously monitors and controls entry onto the active portion of the facility; or

(2)(i) An artificial or natural barrier (e.g., a fence in good repair or a fence combined with a cliff), which completely surrounds the active portion of the facility; and

(ii) A means to control entry, at all times, through the gates or other entrances to the active portion of the facility (e.g., an attendant, television monitors, locked entrance, or controlled roadway access to the facility).

[Comment: The requirements of paragraph (b) of this section are satisfied if the facility or plant within which the active portion is located itself has a surveillance system, or a barrier and a means to control entry, which complies with the requirements of paragraph (b) (1) or (2) of this section. (amended 11/90)]

(3) [Reserved 12/92]

(c) Unless exempt under paragraphs (a)(1) and (a)(2) of this section, a sign with the legend, "Danger Unauthorized Personnel Keep Out," must be posted at each entrance to the active portion of a facility, and at other locations, in sufficient numbers to be seen from any approach to this active portion. The legend must be written in English and in any other language predominant in the area surrounding the facility and must be legible from a distance of at least 25 feet. Existing signs with a legend other than "Danger Unauthorized Personnel Keep Out" may be used if the legend on the sign indicates that only authorized personnel are allowed to enter the active portion, and that entry onto the active portion can be dangerous.

[Comment: See 265.117(b) for discussion of security requirements at disposal facilities during the postclosure care period.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.15. General inspection requirements.

(a) The owner or operator must inspect his facility for malfunctions and deterioration, operator errors, and discharges which may be causing—or may lead to:

(1) release of hazardous waste constituents to the environment or;

(2) a threat to human health. The owner or operator must conduct these inspections often enough to identify problems in time to correct them before they harm human health or the environment.

(b)(1) The owner or operator must develop and follow a written schedule for inspecting monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards.

(2) He must keep this schedule at the facility.

(3) The schedule must identify the types of problems (e.g., malfunctions or deterioration) which are to be looked for during the inspection (e.g., inoperative sump pump, leaking fitting, eroding dike, etc.).

(4) The frequency of inspection may vary for the items on the schedule. However, the frequency should be based on the rate of deterioration of the equipment and the probability of an environmental or human health incident if the deterioration malfunction, or operator error goes undetected between inspections. Areas subject to spills, such as loading and unloading areas, must be inspected daily when in use. At a minimum, the inspection schedule must include the items and frequencies called for in 265.174, 265.193, 265.195, 265.226, 265.260, 265.278, 265.304, 265.347, 265.377, 265.403, 265.1033, 265.1052, 265.1053, 265.1058, and 265.1084 through 265.1090, where applicable.

(c) The owner or operator must remedy any deterioration or malfunction of equipment or structures which the inspection reveals on a schedule which ensures that the problem does not lead to an environmental or human health hazard. Where a hazard is imminent or has already occurred, remedial action must be taken immediately.

(d) The owner or operator must record inspections in an inspection log or summary. He must keep these records at their facility for at least three years from the date of inspection. At a minimum, these

records must include the date and time of the inspection, the name of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012.

265.16. Personnel training.

(a)(1) Facility personnel must successfully complete a program of classroom instruction or on-the-job training that teaches them to perform their duties in a way that ensures the facility's compliance with the requirements of this regulation. The owner or operator must ensure that this program includes all the elements described in the document required under paragraph (d)(3) below.

(2) This program must be directed by a person trained in hazardous waste management procedures, and must include instruction which teaches facility personnel hazardous waste management procedures (including contingency plan implementation) relevant to the positions in which they are employed.

(3) At a minimum, the training program must be designed to ensure that facility personnel are able to respond effectively to emergencies by familiarizing them with emergency procedures, emergency equipment, and emergency systems, including, where applicable:

- (i) Procedures for using, inspecting, repairing, and replacing facility emergency and monitoring equipment;
- (ii) Key parameters for automatic waste feed cut-off system;
- (iii) Communications or alarm systems;
- (iv) Response to fires or explosions;
- (v) Response to groundwater contamination incidents; and,
- (vi) Shutdown of operations.

(4) For facility employees that receive emergency response training pursuant to Occupational Safety and Health Administration (OSHA) regulations 29 CFR 1910.120(p)(8) and 1910.120(q), the facility is not required to provide separate emergency response training pursuant to this section, provided that the overall facility training meets all the requirements of this section.

(b) Facility personnel must successfully complete the program required in paragraph (a) of this Section within six months after the effective date of these regulations or six months after the date of their employment or assignment to a facility, or to a new position at a facility, whichever is later. Employees hired after the effective date of these regulations must not work in unsupervised positions until they have completed the training requirements of paragraph (a) of this Section.

(c) Facility personnel must take part in an annual review of the initial training required in paragraph (a) of this Section.

(d) The owner or operator must maintain the following documents and records at the facility:

(1) The job titles for each position at the facility related to hazardous waste management, and the name of the employee filling each job;

(2) A written job description for each position listed under paragraph (d)(1) of this Section. This description may be consistent in its degree of specificity with descriptions for other similar positions in the same company location or bargaining unit, but must include the requisite skill, education, or other qualifications, and duties of facility personnel assigned to each position;

(3) A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position listed under paragraph (d)(1) of this Section;

(4) Records that document that the training or job experience required under paragraphs (a), (b), and (c) of this Section has been given to, and completed by, facility personnel.

(e) Training records on current personnel must be kept until closure of the facility; training records on former employees must be kept for at least three years from the date of the employee last worked at

the facility. Personnel training records may accompany personnel transferred within the same company.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.17. General requirements for ignitable, reactive, or incompatible wastes.

(a) The owner or operator must take precautions to prevent accidental ignition or reaction of ignitable or reactive waste. This waste must be separated and protected from sources of ignition or reaction including but not limited to: open flames, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, or mechanical), spontaneous ignition (e.g., from heat producing chemical reactions), and radiant heat. While ignitable or reactive waste is being handled, the owner or operator must confine smoking and open flame to especially designated locations. "No Smoking" signs must be conspicuously placed wherever there is a hazard from ignitable or reactive waste.

(b) Where specifically required by other sections of this part, the treatment, storage, or disposal of ignitable or reactive wastes, and the mixture or commingling of incompatible waste or incompatible wastes and other materials, must be conducted so that it does not: (amended 11/90)

- (1) Generate extreme heat or pressure, fire or explosions, or violent reactions;
- (2) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
- (3) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
- (4) Damage the structural integrity of the device or facility containing the waste; or
- (5) Through other like means threaten human health or the environment.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.18. Location standards. [See also R.61-104]

The placement of any hazardous waste in a salt dome, salt bed formation, underground mine or cave is prohibited.

HISTORY: Adopted by State Register Volume 10, Issue No. 1, eff January 24, 1986. Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.19. Construction quality assurance program.

(a) CQA program.

(1) A construction quality assurance (CQA) program is required for all surface impoundment, waste pile, and landfill units that are required to comply with 265.221(a), 265.254, and 265.301(a). The program must ensure that the constructed unit meets or exceeds all design criteria and specifications in the permit. The program must be developed and implemented under the direction of a CQA officer who is a registered professional engineer.

(2) The CQA program must address the following physical components, where applicable:

- (i) Foundations;
- (ii) Dikes;
- (iii) Low-permeability soil liners;
- (iv) Geomembranes (flexible membrane liners);
- (v) Leachate collection and removal systems and leak detection systems; and
- (vi) Final cover systems.

(b) Written CQA plan. Before construction begins on a unit subject to the CQA program under paragraph (a) of this section, the owner or operator must develop a written CQA plan. The plan must identify steps that will be used to monitor and document the quality of materials and the condition and manner of their installation. The CQA plan must include:

- (1) Identification of applicable units, and a description of how they will be constructed.

(2) Identification of key personnel in the development and implementation of the CQA plan, and CQA officer qualifications.

(3) A description of inspection and sampling activities for all unit components identified in paragraph (a)(2) of this section, including observations and tests that will be used before, during, and after construction to ensure that the construction materials and the installed unit components meet the design specifications. The description must cover: Sampling size and locations; frequency of testing; data evaluation procedures; acceptance and rejection criteria for construction materials; plans for implementing corrective measures; and data or other information to be recorded and retained in the operating record under 265.73.

(c) Contents of program.

(1) The CQA program must include observations, inspections, tests, and measurements sufficient to ensure:

(i) Structural stability and integrity of all components of the unit identified in paragraph (a)(2) of this section;

(ii) Proper construction of all components of the liners, leachate collection and removal system, leak detection system, and final cover system, according to permit specifications and good engineering practices, and proper installation of all components (e.g., pipes) according to design specifications;

(iii) Conformity of all materials used with design and other material specifications under 264.221, 264.251, and 264.301 of this chapter.

(2) The CQA program shall include test fills for compacted soil liners, using the same compaction methods as in the full-scale unit, to ensure that the liners are constructed to meet the hydraulic conductivity requirements of 264.221(c)(1), 264.251(c)(1), and 264.301(c)(1) of this chapter in the field. Compliance with the hydraulic conductivity requirements must be verified by using in-situ testing on the constructed test fill. The test fill requirement is waived where data are sufficient to show that a constructed soil liner meets the hydraulic conductivity requirements of 264.221(c)(1), 264.251(c)(1), and 264.301(c)(1) of this chapter in the field.

(d) Certification. The owner or operator of units subject to 265.19 must submit to the Department by certified mail or hand delivery, at least 30 days prior to receiving waste, a certification signed by the CQA officer that the CQA plan has been successfully carried out and that the unit meets the requirements of 265.221(a), 265.254, or 265.301(a). The owner or operator may receive waste in the unit after 30 days from the Department receipt of the CQA certification unless the Department determines in writing that the construction is not acceptable, or extends the review period for a maximum of 30 more days, or seeks additional information from the owner or operator during this period. Documentation supporting the CQA officers certification must be furnished to the Department upon request.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART C

Preparedness and Prevention

265.30. Applicability.

The regulations in this subpart apply to owners and operators of all hazardous waste facilities, except as section 265.1 provides otherwise.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.31. Maintenance and operation of facility.

Facilities must be maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water which could threaten human health or the environment.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.32. Required equipment.

All facilities must be equipped with the following, unless none of the hazards posed by waste handled at the facility could require a particular kind of equipment specified below:

(a) An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel;

(b) A device, such as a telephone (immediately available at the scene of operations) or a hand-held two-way radio, capable of summoning emergency assistance from local police departments, fire departments, or State or local emergency response teams;

(c) Portable fire extinguishers, fire control equipment (including special extinguishing equipment, such as that using foam, inert gas, or dry chemicals), spill control equipment, and decontamination equipment; and,

(d) Water at adequate volume and pressure to supply water hose streams, or foam producing equipment, or automatic sprinklers, or water spray systems.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.33. Testing and maintenance of equipment.

All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment, where required, must be tested and maintained as necessary to assure its proper operation in time of emergency.

265.34. Access to communications or alarm system.

(a) Whenever hazardous waste is being poured, mixed, spread, or otherwise handled, all personnel involved in the operation must have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another employee, unless the Department has ruled that such a device is not required under Section 265.32.

(b) If there is ever just one employee on the premises while the facility is operating, he must have immediate access to a device, such as a telephone (immediately available at the scene of operation) or a hand-held two-way radio, capable of summoning external emergency assistance, unless the Department has ruled that such a device is not required under Section 265.32.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.35. Required aisle space.

The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment to any area of facility operation in an emergency, unless it can be demonstrated to the Department that aisle space is not needed for any of these purposes.

265.37. Arrangements with local authorities.

(a) The owner or operator must attempt to make the following arrangements, as appropriate for the type of waste handled at his facility and the potential need for the services of these organizations:

(1) Arrangements to familiarize police, fire departments, and emergency response teams with layout of the facility, properties of hazardous waste handled at the facility and associated hazards, places where facility personnel would normally be working, entrances to and roads inside the facility, and possible evacuation routes;

(2) Where more than one police and fire department might respond to an emergency, agreements designating primary emergency authority to a specific police and a specific fire department, and agreements with any others to provide support to the primary emergency authority;

(3) Agreements with State emergency response teams, emergency response contractors, and equipment suppliers; and,

(4) Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions, or releases at the facility.

(b) Where State or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.

SUBPART D
Contingency Plan and Emergency Procedures

265.50. Applicability.

The regulations in this subpart apply to owners and operators of all hazardous waste facilities, except as section 265.1 provides otherwise.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.51. Purpose and implementation of contingency plan.

(a) Each owner or operator must have a contingency plan for his facility. The contingency plan must be designed to minimize hazards to human health or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil, or surface water.

(b) The provisions of the plan must be carried out immediately whenever there is a fire, explosion, or release of hazardous waste or hazardous waste constituents which could threaten human health or the environment.

265.52. Content of contingency plan.

(a) The contingency plan must describe the actions facility personnel must take to comply with Sections 265.51 and 265.56 in response to fires, explosions, or any unplanned sudden or non-sudden release of hazardous waste or hazardous waste constituents to air, soil or surface water at the facility.

(b) If the owner or operator has already prepared a Spill Prevention, Control, and Countermeasures (SPCC) Plan in accordance with 40 CFR part 112, or some other emergency or contingency plan, he need only amend that plan to incorporate hazardous waste management provisions that are sufficient to comply with the requirements of this part. The owner or operator may develop one contingency plan which meets all regulatory requirements. EPA recommends that the plan be based on the National Response Team's Integrated Contingency Plan Guidance ("One Plan"). When modifications are made to non-RCRA provisions in an integrated contingency plan, the changes do not trigger the need for a RCRA permit modification.

(c) The plan must describe arrangements agreed to by local police departments, fire departments, hospitals, contractors, and State and local emergency response teams to coordinate emergency services, pursuant to 265.37.

(d) The plan must list names, addresses, and phone numbers (office and home) of all persons qualified to act as emergency coordinator (see Section 265.55) and this list must be kept up to date. Where more than one person is listed, one must be named as primary emergency coordinator and others must be listed in the order in which they will assume responsibility as alternates.

(e) The plan must include a list of all emergency equipment at the facility (such as fire extinguishing systems, spill control equipment, communications and alarm systems (internal and external), and decontamination equipment), where this equipment is required. This list must be kept up to date. In addition, the plan must include the location and a physical description of each item on the list, and a brief outline of its capabilities.

(f) The plan must include an evacuation plan for facility personnel where there is a possibility that evacuation could be necessary. This plan must describe signal(s) to be used to begin evacuation, evacuation routes, and alternate evacuation routes (in cases where the primary routes could be blocked by releases of hazardous waste or fires.)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 9, eff September 28, 2012.

265.53. Copies of contingency plan.

A copy of the contingency plan and all revisions to the plan must be:

- (a) Maintained at the facility; and

(b) Submitted to all local police departments, fire departments, hospitals, and State and local emergency response teams that may be called upon to provide emergency services.

265.54. Amendment of contingency plan.

The contingency plan must be reviewed, and immediately amended, if necessary, whenever:

- (a) Applicable regulations are revised;
- (b) The plan fails in an emergency;
- (c) The facility changes—in its design, construction, operation, maintenance, or other circumstances—in a way that materially increases the potential for fires, explosions, or releases of hazardous waste or hazardous waste constituents, or changes the response necessary in an emergency.
- (d) The list of emergency coordinators changes; or
- (e) The list of emergency equipment changes.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.55. Emergency coordinator.

At all times, there must be at least one employee either on the facility premises or on call (i.e., available to respond to an emergency by reaching the facility within a short period of time) with the responsibility for coordinating all emergency response measures. This emergency coordinator must be thoroughly familiar with all aspects of the facility's contingency plan, all operations and activities at the facility, the location and characteristics of waste handled, the location of all records within the facility, and the facility layout. In addition, this person must have the authority to commit the resources needed to carry out the contingency plan.

[Comment: The emergency coordinator's responsibilities are more fully spelled out in section 265.56. Applicable responsibilities for the emergency coordinator vary, depending on factors such as type and variety of waste(s) handled by the facility, and type and complexity of the facility.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.56. Emergency procedures.

(a) Whenever there is an imminent or actual emergency situation, the emergency coordinator (or his designee when the emergency coordinator is on call) must immediately:

- (1) Activate internal facility alarms or communication systems, where applicable, to notify all facility personnel; and
- (2) Notify appropriate State or local agencies with designated response roles if their help is needed.

(b) Whenever there is a release, fire, or explosion, the emergency coordinator must immediately identify the character, exact source, amount, and areal extent of any released materials and notify the Department per section 265.56(d)(2). They may do this by observation or review of facility records or manifests and, if necessary, by chemical analysis.

(c) Concurrently, the emergency coordinator must assess possible hazards to human health or the environment that may result from the release, fire, or explosion. This assessment must consider both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water run-off from water or chemical agents used to control fire and heat-induced explosions).

(d) If the emergency coordinator determines that the facility has had a release, fire, or explosion which could threaten human health, or the environment, outside the facility, he must report his findings as follows:

- (1) If his assessment indicates that evacuation of local areas may be advisable, he must immediately notify appropriate local authorities. He must be available to help appropriate officials decide whether local areas should be evacuated; and

(2) He must immediately notify the Department (using its 24-hour number 803-253-6488) and the National Response Center (using their 24-hour toll free number 800/424-8802). The report must include:

- (i) Name and telephone number of reporter;
- (ii) Name and address of facility;
- (iii) Time and type of incident (e.g., release, fire);
- (iv) Name and quantity of material(s) involved, to the extent known;
- (v) The extent of injuries, if any; and
- (vi) The possible hazards to human health or the environment, outside the facility.

(e) During an emergency, the emergency coordinator must take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous waste at the facility. These measures must include, where applicable, stopping processes and operations, collecting and containing release waste, and removing or isolating containers.

(f) If the facility stops operations in response to a fire, explosion, or release, the emergency coordinator must monitor for leaks, pressure buildup, gas generation, or ruptures in valves, pipes, or other equipment, wherever this is appropriate.

(g) Immediately after an emergency, the emergency coordinator must provide for treating, storing, or disposing of recovered waste, contaminated soil or surface water, or any other material that results from a release, fire, or explosion at the facility.

[Comment: Unless the owner or operator can demonstrate, in accordance with part 261.3(c) or (d), that the recovered material is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of R.61-79.262 Standards Applicable to Generators of Hazardous Waste, R.61-79.263 Standards Applicable to Transporters of Hazardous Waste and of 61-79.265.]

(h) The emergency coordinator must ensure that, in the affected area(s) of the facility:

(1) No waste that may be incompatible with the released material is treated, stored, or disposed of until cleanup procedures are completed; and

(2) All emergency equipment listed in the contingency plan is cleaned and fit for its intended use before operations are resumed.

(i) The owner or operator must note in the operating record the time, date, and details of any incident that requires implementing the contingency plan. Within 15 days after the incident, he must submit a written report on the incident to the Department. The report must include:

(1) Name, address, and telephone number of the owner or operator;

(2) Name, address, and telephone number of the facility;

(3) Date, time, and type of incident (e.g., fire, explosion);

(4) Name and quantity of material(s) involved;

(5) The extent of injuries, if any;

(6) An assessment of actual or potential hazards to human health or the environment, where this is applicable; and

(7) Estimated quantity and disposition of recovered material that resulted from the incident.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 44-6 Doc. No. 4883, eff June 26, 2020.

SUBPART E

Manifest System, Recordkeeping, and Reporting

265.70. Applicability.

(a) The regulations in this subpart apply to owners and operators of both on-site and off-site facilities, except as 265.1 provides otherwise. Sections 265.71, 265.72, and 265.76 do not apply to

owners and operators of on-site facilities that do not receive any hazardous waste from off-site sources, nor to owners and operators of off-site facilities with respect to waste military munitions exempted from manifest requirements of 266.203(a).

(b) The revised Manifest form and procedures in 260.10, 261.7, 265.70, 265.71, 265.72, and 265.76, shall not apply until September 5, 2006. The Manifest form and procedures in 260.10, 261.7, 265.70, 265.71, 265.72, and 265.76, contained in previous editions of 260 to 265, edition revised as of July 1, 2004, shall be applicable until September 5, 2006.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 31, Issue No. 2, eff February 23, 2007.

265.71. Use of manifest system.

(a)(1) If a facility receives hazardous waste accompanied by a manifest, the owner, operator or his/her agent must sign and date the manifest as indicated in paragraph (a)(2) of this section to certify that the hazardous waste covered by the manifest was received, except as noted in the discrepancy space of the manifest, or that the hazardous waste was rejected as noted in the manifest discrepancy space.

(2) If a facility receives a hazardous waste shipment accompanied by a manifest, the owner, operator or his/her agent must:

- (i) Sign and date, by hand, each copy of the manifest;
 - (ii) Note any discrepancies (as defined in 265.72(a)) on each copy of the manifest;
 - (iii) Immediately give the transporter at least one copy of the manifest;
 - (iv) Within thirty (30) days of delivery, send a copy (Page 2) of the manifest to the generator;
- and;
- (v) Paper manifest submission requirements are:

(A) Options for compliance on June 30, 2018. Beginning on June 30, 2018, send the top copy (Page 1) of any paper manifest and any paper continuation sheet to the e-Manifest system for purposes of data entry and processing, or in lieu of submitting the paper copy to EPA, the owner or operator may transmit to the EPA system an image file of Page 1 of the manifest and any continuation sheet, or both a data file and image file corresponding to Page 1 of the manifest and any continuation sheet, within thirty (30) days of the date of delivery. Submissions of copies to the e-Manifest system shall be made at the mailing address or electronic mail/submission address specified at the e-Manifest program website's directory of services. Beginning on June 30, 2021, EPA will not accept mailed paper manifests from facilities for processing in e-Manifest.

(B) Options for compliance on June 30, 2021. Beginning on June 30, 2021, the requirement to submit the top copy (Page1) of the paper manifest and any paper continuation sheet to the e-Manifest system for purposes of data entry and processing may be met by the owner or operator only by transmitting to the EPA system an image file of Page 1 of the manifest and any continuation sheet, or by transmitting to the EPA system both a data file and the image file corresponding to Page 1 of the manifest and any continuation sheet, within thirty (30) days of the date of delivery. Submissions of copies to the e-Manifest system shall be made to the electronic mail/submission address specified at the e-Manifest program website's directory of services; and

(vi) Retain at the facility a copy of each manifest for at least three (3) years from the date of delivery.

(3) The owner or operator of a facility that receives hazardous waste subject to part 262, subpart H, from a foreign source must:

- (i) Additionally, list the relevant consent number from consent documentation supplied by EPA to the facility for each waste listed on the manifest, matched to the relevant list number for the waste from block 9b. If additional space is needed, the owner or operator should use a Continuation Sheet(s) (EPA Form 8700-22A); and

(ii) Send a copy of the manifest to EPA using the addresses listed in section 262.82(e) within thirty (30) days of delivery until the facility can submit such a copy to the e-Manifest system per paragraph (a)(2)(v) of this section.

(b) If a facility receives, from a rail or water (bulk shipment) transporter, hazardous waste which is accompanied by a shipping paper containing all the information required on the manifest (excluding the EPA identification numbers, generator's certification, and signatures), the owner or operator, or his agent, must:

(1) Sign and date each copy of the manifest or shipping paper (if the manifest has not been received) to certify that the hazardous waste covered by the manifest or shipping paper was received;

(2) Note any significant discrepancies (as defined in section 265.72(a)) in the manifest or shipping paper (if the manifest has not been received) on each copy of the manifest or shipping paper.

[Comment: The Department does not intend that the owner or operator of a facility whose procedures under 265.13(c) include waste analysis must perform that analysis before signing the shipping paper and giving it to the transporter. Section 265.72(b), however, requires reporting an unreconciled discrepancy discovered during later analysis.]

(3) Immediately give the rail or water (bulk shipment) transporter at least one copy of the manifest or shipping paper (if the manifest has not been received);

(4) Within 30 days after the delivery, send a copy of the signed and dated manifest or a signed and dated copy of the shipping paper (if the manifest has not been received within 30 days after delivery) to the generator; and

[Comment: Section 262.23(c) of this chapter requires the generator to send three copies of the manifest to the facility when hazardous waste is sent by rail or water (bulk shipment).]

(5) Retain at the facility a copy of the manifest and shipping paper (if signed in lieu of the manifest at the time of delivery) for at least three years from the date of delivery.

(c) Whenever a shipment of hazardous waste is initiated from a facility, the owner or operator of that facility must comply with the requirements of part 262. The provisions of R.61-79.262.15, 262.16, and 262.17 are applicable to the on-site accumulation of hazardous wastes by generators. Therefore, the provisions of R.61-79.262.15, 262.16, and 262.17 only apply to owners or operators who are shipping hazardous waste which they generated at that facility or operating as a large quantity generator consolidating hazardous waste from very small quantity generators under section 262.17(f).

(d) As per section 262.84(d)(2)(xv), within three (3) working days of the receipt of a shipment subject to part 262, subpart H, the owner or operator of a facility must provide a copy of the movement document bearing all required signatures to the foreign exporter; to the competent authorities of the countries of export and transit that control the shipment as an export and transit shipment of hazardous waste respectively; and on or after the electronic import-export reporting compliance date, to EPA electronically using EPA's WIETS, or its successor system. The original copy of the movement document must be maintained at the facility for at least three (3) years from the date of signature. The owner or operator of a facility may satisfy this recordkeeping requirement by retaining electronically submitted documents in the facility's account on WIETS, or its successor system, provided that copies are readily available for viewing and production if requested by any EPA or authorized state inspector. No owner or operator of a facility may be held liable for the inability to produce the documents for inspection under this section if the owner or operator of a facility can demonstrate that the inability to produce the document is due exclusively to technical difficulty with WIETS, or its successor system, for which the owner or operator of a facility bears no responsibility.

(e) A facility must determine whether the consignment state for a shipment regulates any additional wastes (beyond those regulated Federally) as hazardous wastes under its state hazardous waste program. Facilities must also determine whether the consignment state or generator state requires the facility to submit any copies of the manifest to these states.

(f) Legal equivalence to paper manifests. Electronic manifests that are obtained, completed, and transmitted in accordance with Section 262.20(a)(3) of this chapter, and used in accordance with this section in lieu of the paper manifest form are the legal equivalent of paper manifest forms bearing handwritten signatures, and satisfy for all purposes any requirement in these regulations to obtain, complete, sign, provide, use, or retain a manifest.

(1) Any requirement in these regulations for the owner or operator of a facility to sign a manifest or manifest certification by hand, or to obtain a handwritten signature, is satisfied by signing with or obtaining a valid and enforceable electronic signature within the meaning of 262.25.

(2) Any requirement in these regulations to give, provide, send, forward, or to return to another person a copy of the manifest is satisfied when a copy of an electronic manifest is transmitted to the other person.

(3) Any requirement in these regulations for a manifest to accompany a hazardous waste shipment is satisfied when a copy of an electronic manifest is accessible during transportation and forwarded to the person or persons who are scheduled to receive delivery of the hazardous waste shipment.

(4) Any requirement in these regulations for an owner or operator to keep or retain a copy of each manifest is satisfied by the retention of the facility's electronic manifest copies in its account on the e-Manifest system, provided that such copies are readily available for viewing and production if requested by any EPA or authorized Department inspector.

(5) No owner or operator may be held liable for the inability to produce an electronic manifest for inspection under this section if the owner or operator can demonstrate that the inability to produce the electronic manifest is due exclusively to a technical difficulty with the electronic manifest system for which the owner or operator bears no responsibility.

(g) An owner or operator may participate in the electronic manifest system either by accessing the electronic manifest system from the owner's or operator's electronic equipment, or by accessing the electronic manifest system from portable equipment brought to the owner's or operator's site by the transporter who delivers the waste shipment to the facility.

(h) Special procedures applicable to replacement manifests. If a facility receives hazardous waste that is accompanied by a paper replacement manifest for a manifest that was originated electronically, the following procedures apply to the delivery of the hazardous waste by the final transporter:

(1) Upon delivery of the hazardous waste to the designated facility, the owner or operator must sign and date each copy of the paper replacement manifest by hand in Item 20 (Designated Facility Certification of Receipt) and note any discrepancies in Item 18 (Discrepancy Indication Space) of the paper replacement manifest,

(2) The owner or operator of the facility must give back to the final transporter one copy of the paper replacement manifest,

(3) Within thirty (30) days of delivery of the waste to the designated facility, the owner or operator of the facility must send one signed and dated copy of the paper replacement manifest to the generator, and send an additional signed and dated copy of the paper replacement manifest to the electronic manifest system, and

(4) The owner or operator of the facility must retain at the facility one copy of the paper replacement manifest for at least three (3) years from the date of delivery.

(i) Special procedures applicable to electronic signature methods undergoing tests. If an owner or operator using an electronic manifest signs this manifest electronically using an electronic signature method which is undergoing pilot or demonstration tests aimed at demonstrating the practicality or legal dependability of the signature method, then the owner or operator shall also sign with an ink signature the facility's certification of receipt or discrepancies on the printed copy of the manifest provided by the transporter. Upon executing its ink signature on this printed copy, the owner or operator shall retain this original copy among its records for at least three (3) years from the date of delivery of the waste.

(j) Imposition of user fee for electronic manifest use.

(1) As prescribed in section 265.1311, and determined in section 265.1312, an owner or operator who is a user of the electronic manifest system shall be assessed a user fee by EPA for the submission and processing of each electronic and paper manifest. EPA shall update the schedule of user fees and publish them to the user community, as provided in section 265.1313.

(2) An owner or operator subject to user fees under this section shall make user fee payments in accordance with the requirements of section 265.1314, subject to the informal fee dispute resolution process of section 265.1316, and subject to the sanctions for delinquent payments under section 265.1315.

(k) Electronic manifest signatures. Electronic manifest signatures shall meet the criteria described in Section 262.25 of this chapter.

(l) Post-receipt manifest data corrections. After facilities have certified to the receipt of hazardous wastes by signing Item 20 of the manifest, any post-receipt data corrections may be submitted at any time by any interested person (e.g., waste handler) shown on the manifest.

(1) Interested persons must make all corrections to manifest data by electronic submission, either by directly entering corrected data to the web-based service provided in e-Manifest for such corrections, or by an upload of a data file containing data corrections relating to one or more previously submitted manifests.

(2) Each correction submission must include the following information:

(i) The Manifest Tracking Number and date of receipt by the facility of the original manifest(s) for which data are being corrected;

(ii) The Item Number(s) of the original manifest that is the subject of the submitted correction(s); and

(iii) For each Item Number with corrected data, the data previously entered and the corresponding data as corrected by the correction submission.

(3) Each correction submission shall include a statement that the person submitting the corrections certifies that to the best of his or her knowledge or belief, the corrections that are included in the submission will cause the information reported about the previously received hazardous wastes to be true, accurate, and complete.

(i) The certification statement must be executed with a valid electronic signature; and

(ii) A batch upload of data corrections may be submitted under one (1) certification statement.

(4) Upon receipt by the system of any correction submission, other interested persons shown on the manifest will be provided electronic notice of the submitter's corrections.

(5) Other interested persons shown on the manifest may respond to the submitter's corrections with comments to the submitter, or by submitting another correction to the system, certified by the respondent as specified in paragraph (l)(3) of this section, and with notice of the corrections to other interested persons shown on the manifest.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 31, Issue No. 2, eff February 23, 2007; State Register Volume 36, Issue No. 9, eff September 28, 2012; State Register Volume 40, Issue No. 5, Doc. No. 4646, eff May 27, 2016; SCSR 42-12 Doc. No. 4840, eff December 28, 2018; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 43-11 Doc. No. 4882, eff November 22, 2019; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

265.72. Manifest discrepancies.

(a) Manifest discrepancies are:

(1) Significant differences (as defined by paragraph (b) of this section) between the quantity or type of hazardous waste designated on the manifest or shipping paper, and the quantity and type of hazardous waste a facility actually receives;

(2) Rejected wastes, which may be a full or partial shipment of hazardous waste that the TSDF cannot accept; or

(3) Container residues, which are residues that exceed the quantity limits for "empty" containers set forth in 261.7(b).

(b) Significant differences in quantity are:

(1) For bulk waste, variations greater than 10 percent in weight;

(2) for batch waste, any variation in piece count, such as a discrepancy of one drum in a truckload. Significant differences in type are obvious differences which can be discovered by inspection or waste analysis, such as waste solvent substituted for waste acid, or toxic constituents not reported on the manifest or shipping paper.

(c) Upon discovering a significant difference in quantity or type, the owner or operator must attempt to reconcile the discrepancy with the waste generator or transporter (*e.g.*, with telephone conversations). If the discrepancy is not resolved within 15 days after receiving the waste, the owner or operator must immediately submit to the Regional Administrator a letter describing the discrepancy and attempts to reconcile it, and a copy of the manifest or shipping paper at issue.

(d)(1) Upon rejecting waste or identifying a container residue that exceeds the quantity limits for "empty" containers set forth in 261.7(b), the facility must consult with the generator prior to forwarding the waste to another facility that can manage the waste. If it is impossible to locate an alternative facility that can receive the waste, the facility may return the rejected waste or residue to the generator. The facility must send the waste to the alternative facility or to the generator within 60 days of the rejection or the container residue identification.

(2) While the facility is making arrangements for forwarding rejected wastes or residues to another facility under this section, it must ensure that either the delivering transporter retains custody of the waste, or the facility must provide for secure, temporary custody of the waste, pending delivery of the waste to the first transporter designated on the manifest prepared under paragraph (e) or (f) of this section.

(e) Except as provided in paragraph (e)(7) of this section, for full or partial load rejections and residues that are to be sent off-site to an alternate facility, the facility is required to prepare a new manifest in accordance with 262.20(a) of this chapter and the following instructions:

(1) Write the generator's U.S. EPA ID number in Item 1 of the new manifest. Write the generator's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the generator's site address, then write the generator's site address in the designated space in Item 5.

(2) Write the name of the alternate designated facility and the facility's U.S. EPA ID number in the designated facility block (Item 8) of the new manifest.

(3) Copy the manifest tracking number found in Item 4 of the old manifest to the Special Handling and Additional Information Block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment.

(4) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the Discrepancy Block of the old manifest (Item 18a).

(5) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.

(6) Sign the Generator's/Offerrer's Certification to certify, as the offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation, and mail a signed copy of the manifest to the generator identified in Item 5 of the new manifest.

(7) For full load rejections that are made while the transporter remains present at the facility, the facility may forward the rejected shipment to the alternate facility by completing Item 18b of the original manifest and supplying the information on the next destination facility in the Alternate Facility space. The facility must retain a copy of this manifest for its records, and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with paragraphs (e)(1), (2), (3), (4), (5), and (6) of this section.

(f) Except as provided in paragraph (f)(7) of this section, for rejected wastes and residues that must be sent back to the generator, the facility is required to prepare a new manifest in accordance with 262.20(a) of this chapter and the following instructions:

(1) Write the facility's U.S. EPA ID number in Item 1 of the new manifest. Write the facility's name and mailing address in Item 5 of the new manifest. If the mailing address is different from the facility's site address, then write the facility's site address in the designated space for Item 5 of the new manifest.

(2) Write the name of the initial generator and the generator's U.S. EPA ID number in the designated facility block (Item 8) of the new manifest.

(3) Copy the manifest tracking number found in Item 4 of the old manifest to the Special Handling and Additional Information Block of the new manifest, and indicate that the shipment is a residue or rejected waste from the previous shipment,

(4) Copy the manifest tracking number found in Item 4 of the new manifest to the manifest reference number line in the Discrepancy Block of the old manifest (Item 18a),

(5) Write the DOT description for the rejected load or the residue in Item 9 (U.S. DOT Description) of the new manifest and write the container types, quantity, and volume(s) of waste.

(6) Sign the Generator's/Officer's Certification to certify, as offeror of the shipment, that the waste has been properly packaged, marked and labeled and is in proper condition for transportation,

(7) For full load rejections that are made while the transporter remains at the facility, the facility may return the shipment to the generator with the original manifest by completing Item 18a and 18b of the manifest and supplying the generator's information in the Alternate Facility space. The facility must retain a copy for its records and then give the remaining copies of the manifest to the transporter to accompany the shipment. If the original manifest is not used, then the facility must use a new manifest and comply with paragraphs (f)(1), (2), (3), (4), (5), (6), and (8) of this section.

(8) For full or partial load rejections and container residues contained in non-empty containers that are returned to the generator, the facility must also comply with the exception reporting requirements in 262.42(a).

(g) If a facility rejects a waste or identifies a container residue that exceeds the quantity limits for "empty" containers set forth in 261.7(b) after it has signed, dated, and returned a copy of the manifest to the delivering transporter or to the generator, the facility must amend its copy of the manifest to indicate the rejected wastes or residues in the discrepancy space of the amended manifest. The facility must also copy the manifest tracking number from Item 4 of the new manifest to the discrepancy space of the amended manifest, and must re-sign and date the manifest to certify to the information as amended. The facility must retain the amended manifest for at least three years from the date of amendment, and must within 30 days, send a copy of the amended manifest to the transporter and generator that received copies prior to their being amended.

HISTORY: Amended by State Register Volume 31, Issue No. 2, eff February 23, 2007; State Register Volume 36, Issue No. 9, eff September 28, 2012.

265.73. Operating record.

(a) The owner or operator must keep a written operating record at his facility.

(b) The following information must be recorded, as it becomes available, and maintained in the operating record for three years unless noted below:

(1) A description and the quantity of each hazardous waste received, and the method(s) and date(s) of its treatment, storage, or disposal at the facility as required by Appendix I to part 265. This information must be maintained in the operating record until closure of the facility;

(2) The location of each hazardous waste within the facility and the quantity at each location. For disposal facilities, the location and quantity of each hazardous waste must be recorded on a map or diagram of each cell or disposal area. For all facilities, this information must include cross references to manifest document numbers if the waste was accompanied by a manifest. This information must be maintained in the operating record until closure of the facility;

[Comment: See 265.119, 265.279, and 265.309 for related requirements.] (revised 12/92)

(3) Records and results of waste analysis, waste determinations, and trial tests performed as specified in 265.13, 265.200, 265.225, 265.252, 265.273, 265.314, 265.341, 265.375, 265.402, 265.1034, 265.1063, 265.1084, 268.4(a), and 268.7 (amended 11/90, 12/92).

(4) Summary reports and details of all incidents that require implementing the contingency plan as specified in section 265.56(j);

(5) Records and results of inspections as required by section 265.15(d) (except these data need be kept only three years);

(6) Monitoring, testing or analytical data, and corrective action where required by subpart F of this part and by 265.19, 265.94, 265.191, 265.193, 265.195, 265.224, 265.226, 265.255, 265.260, 265.276, 265.278, 265.280(d)(1), 265.302, 265.304, 265.347, 265.377, 265.1034(c) through

265.1034(f), 265.1035, 265.1063(d) through 265.1063(i), 265.1064, and 265.1083 through 265.1090. Maintain in the operating record for three years, except for records and results pertaining to groundwater monitoring and cleanup, and response action plans for surface impoundments, waste piles, and landfills, which must be maintained in the operating record until closure of the facility. [Comment: As required by 265.94, monitoring data at disposal facilities must be kept throughout the postclosure period.] (revised 12/92)

(7) All closure cost estimates under 265.142 and, for disposal facilities, all postclosure cost estimates under 265.144 must be maintained in the operating record until closure of the facility.

(8) Records of the quantities (and date of placement) for each shipment of hazardous waste placed in land disposal units under an extension to the effective date of any land disposal restriction granted pursuant to 268.5, monitoring data required pursuant to a petition under 268.6, or a certification under 268.8, and the applicable notice required by a generator under 268.7(a). All of this information must be maintained in the operating record until closure of the facility.

(9) For an offsite treatment facility, a copy of the notice, and the certification and demonstration if applicable, required by the generator or the owner or operator under 268.7 or 268.8;

(10) For an onsite treatment facility, the information contained in the notice (except the manifest number), and the certification and demonstration if applicable, required by the generator or the owner or operator under 268.7 or 268.8;

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

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

(13) For an offsite storage facility, a copy of the notice, and the certification and demonstration if applicable, required by the generator or the owner or operator under 268.7 or 268.8 ; and (amended 11/90)

(14) For an onsite storage facility, the information contained in the notice (except the manifest number), and the certification and demonstration if applicable, required by the generator or the owner or operator of a treatment facility under 268.7 or 268.8.

(15) Monitoring, testing or analytical data, and corrective action where required by 265.90, 265.93(d)(2), and 265.93(d)(5), and the certification as required by 265.196(f) must be maintained in the operating record until closure of the facility.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.74. Availability, retention, and disposition of records.

(a) All records, including plans, required under this regulation must be furnished upon request, and made available at all reasonable times for inspection, by any officer, employee, or representative of the Department.

(b) The retention period for all records required under this regulation is extended automatically during the course of any unresolved enforcement action regarding the facility or as requested by the Department.

(c) A copy of records of waste disposal locations and quantities under section 265.73(b)(2) must be submitted to the Department and local land authority upon closure of the facility (see 265.119).

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.75. Quarterly report.

(a) Each owner or operator of a hazardous waste facility shall, no later than thirty (30) days after the end of each calendar quarter, submit a written report to the Department including, but not limited to, the following information:

(1) The types and quantities of hazardous waste generated giving the EPA hazardous waste number (from R.61-79.261 Subparts C or D) and the DOT hazardous class;

(2) The types and quantities of hazardous waste received at the facility during the reporting period;

(3) The types and quantities of hazardous wastes treated, stored, disposed of, and otherwise handled during the reporting period;

(4) The EPA identification number, name, and address of the facility;

(5) The calendar quarter covered by the report;

(6) For off-site facilities, the EPA identification number of each hazardous waste generator from which the facility received a hazardous waste during the year; for imported shipments, the report must give the name and address of the foreign generator;

(7) A description and the quantity of each hazardous waste the facility received during the year. For offsite facilities, this information must be listed by EPA identification number of each generator;

(8) The most recent closure cost estimate under Section 265.142, and, for disposal facilities, the most recent post-closure cost estimate under Section 264.144; and

(9) Certification from any out-of-state generator who shipped waste to the facility during the reporting period that he has a program in place to reduce the volume or quantity and toxicity of such waste to the degree determined to be economically practicable and that the proposed method of handling the waste is that practicable method currently available which minimizes the present and future threat to human health and the environment;

(10) The method of treatment, storage, or disposal for each hazardous waste;

(11) Monitoring data under Sections 265.94(a)(2)(ii) and (iii), and (b)(2), where required;

(12) The certification signed by the owner or operator of the facility or his authorized representative.

(13) [Moved 12/93 to 265.77(e)]

(14) [Moved 12/93 to 265.78]

(15) Certification of information by the owner or operator of the facility or his authorized representative.

(b) Each owner or operator shall submit the information required by paragraph (a) above on a form designated by the Department and according to the instructions included with such form.

(c) Each owner or operator shall retain a copy of the report required in paragraphs (a) and (b) above for a period of three (3) years.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.76. Unmanifested waste report.

(a) If a facility accepts for treatment, storage, or disposal any hazardous waste from an off-site source without an accompanying manifest, or without an accompanying shipping paper as described by section 263.20(e), and if the waste is not excluded from the manifest requirement by this chapter, then the owner or operator must prepare and submit a letter to the Department within fifteen (15) days after receiving the waste. The unmanifested waste report must contain the following information:

(1) The EPA identification number, name and address of the facility;

(2) The date the facility received the waste;

(3) The EPA identification number, name and address of the generator and the transporter, if available;

(4) A description and the quantity of each unmanifested hazardous waste the facility received;

[Comment: Conditionally exempt small quantities of hazardous waste are excluded from this regulation and do not require a manifest. Where a facility receives unmanifested hazardous wastes, the Agency requires that the owner or operator obtain from each generator a certification that the

waste qualifies for exclusion. Otherwise, the Agency requires that the owner or operator file an unmanifested waste report for the hazardous waste movement.]

(5) The method of treatment, storage, or disposal for each hazardous waste;

(6) The certification signed by the owner or operator of the facility or his authorized representative; and

(7) A brief explanation of why the waste was unmanifested, if known.

(8) [Reserved 12/92]

(b) [Reserved]

HISTORY: Amended by State Register Volume 11, Issue No. 3, eff March 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 31, Issue No. 2, eff February 23, 2007; SCSR 44-6 Doc. No. 4883, eff June 26, 2020.

265.77. Additional reports.

In addition to quarterly and unmanifested waste reports described in 265.75 and 265.76, the Department may require, as deemed necessary, the owners and operators of facilities to furnish additional reports concerning their hazardous waste activities including the following: (amended 11/90)

(a) Releases, fires, and explosions as specified in Section 265.56(j);

(b) Groundwater contamination and monitoring data as specified in Sections 265.93 and 265.94; and

(c) Facility closure as specified in Section 265.115.

(d) As otherwise required by subparts AA, BB and CC.

(e) With the fourth quarter report, generators who treat, store, or dispose of hazardous waste onsite, a description of the efforts undertaken during the year to reduce the volume and toxicity of waste generated.

(f) With the fourth quarter report, generators who treat, store, or dispose of hazardous waste onsite, a description of the changes in volume and toxicity of waste actually achieved during the year in comparison to previous years to the extent such information is available for the years prior to 1984.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.78. Hazardous waste contingency fund fees.

A check made payable to the Department for payment of the following fees [see § 44-56-60] (amended 11/90, 12/92):

(a) A fee of \$34.00 per ton of hazardous waste landfilled or other means of land disposal and \$10.00 per ton of hazardous waste incinerated, and \$13.70 per ton of other wastes generated by the facility and disposed of in this State at a hazardous waste facility, except that the per ton fee for hazardous wastes received shall be no less than the fee imposed by the state from which the wastes originated [see 44-56-170 and -510];

(b) A fee of \$1.00 per ton of hazardous wastes in excess of fifty (50) tons remaining in storage at the end of the reporting period; and

(c) Fees imposed by this subsection must be collected by the facility at which the waste is incinerated and remitted to the State Treasurer to be credited to the general fund of the State. For purposes of 264.78(a) "incineration" includes hazardous waste incinerators, boilers, and industrial furnaces.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART F
Ground-water Monitoring

265.90. Applicability.

(a) Within one year after the effective date of these regulations, the owner or operator of a surface impoundment, landfill, or land treatment facility which is used to manage hazardous waste must implement a groundwater monitoring program capable of determining the facility's impact on the quality of groundwater in the uppermost aquifer underlying the facility, except as section 265.1 and paragraph (c) of this section provide otherwise.

(b) Except as paragraphs (c) and (d) of this Section provide otherwise, the owner or operator must install, operate, and maintain a groundwater monitoring system which meets the requirements of Section 265.91, and must comply with Sections 265.92 through 265.94. This groundwater monitoring program must be carried out during the active life of the facility, and for disposal facilities, during the post-closure care period as well.

(c) All or part of the groundwater monitoring requirements of this Subpart may be waived if the owner or operator can demonstrate that there is a low potential for migration of hazardous waste or hazardous waste constituents from the facility via the uppermost aquifer to water supply wells (domestic, industrial, or agricultural) or to surface water. This demonstration must be in writing and must be kept at the facility. This demonstration must be certified by a qualified geologist or geotechnical engineer and must establish the following:

(1) The potential for migration of hazardous waste or hazardous constituents from the facility to the uppermost, aquifer, by an evaluation of:

- (i) A water balance of precipitation, evapotranspiration, runoff, and infiltration; and
- (ii) Unsaturated zone characteristics (i.e., geologic materials, physical properties, and depth to groundwater); and

(2) The potential for hazardous waste or hazardous waste constituents which enter the uppermost aquifer to migrate to a water supply well or surface water, by an evaluation of:

- (i) Saturated zone characteristics (i.e., geologic materials, physical properties, and rate of groundwater flow); and
- (ii) The proximity of the facility to water supply wells or surface water.

(3) [Reserved 12/92]

(d) If an owner or operator assumes (or knows) that groundwater monitoring of indicator parameters in accordance with Sections 265.91 and 265.92 would show statistically significant increases (or decreases in the case of pH) when evaluated under Section 265.93(b), he may install, operate, and maintain an alternate groundwater monitoring system (other than the one described in Section 265.91 and 265.92). If the owner or operator decides to use an alternate groundwater monitoring system he must:

(1) Within one year after the effective date of these regulations, develop a specific plan, certified by a qualified geologist or geotechnical engineer, which satisfies the requirements of 265.93(d)(3), for an alternate groundwater monitoring system. This plan is to be placed in the facility's operating record and maintained until closure of the facility;

(2) Not later than one year after the effective date of these regulations, initiate the determinations specified in paragraph 265.93(d)(4);

(3) Prepare a report in accordance with 265.93(d)(5) and place it in the facility's operating record and maintain until closure of the facility;

(4) Continue to make the determinations specified in paragraph 265.93(d)(4), on a quarterly basis until final closure of the facility; and

(5) Comply with the recordkeeping and reporting requirements in paragraph 265.94(b).

(e) The groundwater monitoring requirements of this Subpart may be waived with respect to any surface impoundment that (1) is used to neutralize wastes which are hazardous solely because they exhibit the corrosivity characteristic under R.61-79.261.22 or are listed as hazardous wastes Subpart D

of R.61-79.261 only for this reason, and (2) contains no other hazardous wastes, if the owner or operator can demonstrate that there is no potential for migration of hazardous wastes from the impoundment. The demonstration must establish, based upon consideration of the characteristics of the wastes and the impoundment, that the corrosive wastes will be neutralized to the extent that they no longer meet the corrosivity characteristic before they can migrate out of the impoundment. The demonstration must be in writing and must be certified by a qualified professional.

(f) The Department may replace all or part of the requirements of this subpart applying to a regulated unit (as defined in 264.90), with alternative requirements developed for groundwater monitoring set out in an approved closure or postclosure plan, where the Department determines that:

(1) A regulated unit is situated among solid waste management units (or areas of concern), a release has occurred, and both the regulated unit and one or more solid waste management unit(s) (or areas of concern) are likely to have contributed to the release; and

(2) It is not necessary to apply the requirements of this subpart because the alternative requirements will protect human health and the environment. The alternative standards for the regulated unit must meet the requirements of 264.101(a).

HISTORY: Amended by State Register Volume 12, Issue No.10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 32, Issue No, 6, eff June 27, 2008.

265.91. Groundwater monitoring system.

(a) A groundwater monitoring system must be capable of yielding groundwater samples for analysis and must consist of:

(1) Monitoring wells (at least one) installed hydraulically upgradient (i.e., in the direction of increasing static head) from the limit of the waste management area. Their number, locations, and depths must be sufficient to yield groundwater samples that are:

(i) Representative of background groundwater quality in the uppermost aquifer near the facility; and

(ii) Not affected by the facility; and

(2) Monitoring wells (at least three) installed hydraulically downgradient (i.e., in the direction of decreasing static head) at the limit of the waste management area. Their number, locations, and depths must ensure that they immediately detect any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer.

(3) The facility owner or operator may demonstrate that an alternate hydraulically downgradient monitoring well location will meet the criteria outlined below. The demonstration must be in writing and kept at the facility. The demonstration must be certified by a qualified geologist or geotechnical engineer and establish that:

(i) An existing physical obstacle prevents monitoring well installation at the hydraulically downgradient limit of the waste management area; and

(ii) The selected alternate downgradient location is as close to the limit of the waste management area as practical; and

(iii) The location ensures detection that, given the alternate location, is as early as possible of any statistically significant amounts of hazardous waste or hazardous waste constituents that migrate from the waste management area to the uppermost aquifer.

(iv) Lateral expansion, new, or replacement units are not eligible for an alternate downgradient location under this paragraph.

(b) Separate monitoring systems for each waste management component of a facility are not required provided that provisions for sampling upgradient and downgradient water quality will detect any discharge from the waste management area.

(1) In the case of a facility consisting of only one surface impoundment, landfill, or land treatment area, the waste management area is described by the waste boundary (perimeter).

(2) In the case of a facility consisting of more than one surface impoundment, landfill or land treatment area, the waste management area is described by an imaginary boundary line which circumscribes the several waste management components.

(c) All monitoring wells must be cased in a manner that maintains the integrity of the monitoring well bore hole. This casing must be screened or perforated, and packed with gravel or sand, where necessary, to enable sample collection at depths where appropriate aquifer flow zones exist. The annular space (i.e., the space between the bore hole and well casing) above the sampling depth must be sealed with a suitable material (e.g., cement grout or bentonite slurry) to prevent contamination of samples and the groundwater. All monitoring wells will have a locking cap or other security devices to prevent damage and/or vandalism. Each well will be labeled with an identification plate constructed of a durable material affixed to the casing or surface pad where it is readily visible. The plate will provide monitoring well identification number, date of construction, total well depth, static water level, and driller name and state certification number.

(d) If not otherwise proposed as part of a plan submitted for approval by the Department, the general design, construction, and location of monitoring wells will be submitted to the Department for approval prior to installation. [Note: See for guidance EPA's RCRA Ground-Water Monitoring Technical Enforcement Guidance Document, TEGD].

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995.

265.92. Sampling and analysis.

(a) The owner or operator must obtain and analyze samples from the installed groundwater monitoring system. The owner or operator must develop and follow a groundwater sampling and analysis plan. The plan must be kept at the facility and must include procedures and techniques for:

- (1) Sample collection;
- (2) Sample preservation and shipment;
- (3) Analytical procedures; and
- (4) Chain of custody control.

[Comment: See Procedures Manual For Ground-water Monitoring At Solid Waste Disposal Facilities, EPA-530/SW-611, August 1977 and Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, March 1979 for discussions of sampling and analysis procedures.]

(b) The owner or operator must determine the concentration or value of the following parameters in groundwater samples in accordance with paragraphs (c) and (d) of this section:

(1) Parameters characterizing the suitability of the groundwater as a drinking water supply, as specified in Appendix III.

(2) Parameters establishing groundwater quality:

- (i) Chloride
- (ii) Iron
- (iii) Manganese
- (iv) Phenols
- (v) Sodium
- (vi) Sulfate

[Comment: These parameters are to be used as a basis for comparison in the event a ground-water quality assessment is required under 265.93(d).]

(3) Parameters used as indicators of groundwater contamination:

- (i) pH
- (ii) Specific Conductance
- (iii) Total Organic Carbon
- (iv) Total Organic Halogen

(c)(1) For all monitoring wells, the owner or operator must establish initial background concentrations or values of all parameters specified in paragraph (b) of this Section. He must do this quarterly for one year.

(2) For each of the indicator parameters specified in paragraph (b)(3) of this Section, at least four replicate measurements must be obtained for each sample and the initial background arithmetic mean and variance must be determined by pooling the replicate measurements for the respective parameter concentrations or values in samples obtained from upgradient wells during the first year.

(d) After the first year, all monitoring wells must be sampled and the samples analyzed with the following frequencies:

(1) Samples collected to establish groundwater quality must be obtained and analyzed for the parameters specified in paragraph (b)(2) of this Section at least annually.

(2) Samples collected to indicate groundwater contamination must be obtained and analyzed for the parameters specified in paragraph (b)(3) of this Section at least semi-annually.

(e) Elevation of the groundwater surface at each monitoring well must be determined each time a sample is obtained.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.93. Preparation, evaluation, and response.

(a) The owner or operator must prepare an outline of groundwater quality assessment program. The outline must describe a more comprehensive groundwater monitoring program (than that described in Sections 265.91 and 265.92) capable of determining:

(1) Whether hazardous waste or hazardous waste constituents have entered the groundwater;

(2) The rate and extent of migration of hazardous waste or hazardous waste constituents in the groundwater; and

(3) The concentration of hazardous waste or hazardous waste constituents in the groundwater.

(b) For each indicator parameter specified in Paragraph 265.92(b)(3), the owner or operator must calculate the arithmetic mean and variance, based on at least four replicate measurements on each sample, for each well monitored in accordance with Paragraph 265.92(d)(2), and compare these results with its initial background arithmetic mean. The comparison must consider individually each of the wells in the monitoring system, and must use the Student's t-test at the 0.01 level of significance (see Appendix IV) to determine statistically significant increases (and decreases, in the case of pH) over initial background.

(c)(1) If the comparisons for the upgradient wells made under paragraph (b) of this Section show a significant increase (or pH decrease), the owner or operator must submit this information in accordance with Paragraph 265.94(a)(2)(ii).

(2) If the comparisons for downgradient wells made under paragraph (b) of this Section show a significant increase (or pH decrease), the owner or operator must then immediately obtain additional groundwater samples from those downgradient wells where a significant difference was detected, split the samples in two, and obtain analyses of all additional samples to determine whether the significant difference was a result of laboratory error.

(d)(1) If the analyses performed under paragraph (c)(2) of this Section confirm the significant increase (or pH decrease), the owner or operator must provide written notice to the Department - within seven days of the date of such confirmation - that the facility may be affecting groundwater quality.

(2) Within 15 days after the notification under paragraph (d)(1) of this section, the owner or operator must develop a specific plan, based on the outline required under paragraph (a) of this section and certified by a qualified geologist or geotechnical engineer, for groundwater quality assessment at the facility. This plan must be placed in the facility operating record and be maintained until closure of the facility.

(3) The plan to be submitted under paragraph 265.90(d)(1) or paragraph (d)(2) of this Section must specify:

(i) The number, location, and depth of wells;

(ii) Sampling and analytical methods for those hazardous wastes or hazardous waste constituents in the facility;

(iii) Evaluation procedures, including any use of previously-gathered groundwater quality information; and

(iv) A schedule of implementation.

(4) The owner or operator must implement the groundwater quality assessment plan which satisfies the requirements of paragraph (d)(3) of this Section, and, at a minimum, determine:

(i) The rate and extent of migration of the hazardous waste or hazardous waste constituents in the groundwater; and

(ii) The concentrations of the hazardous waste or hazardous waste constituents in the groundwater.

(5) The owner or operator must make his first determination under paragraph (d)(4) of this section, as soon as technically feasible, and prepare a report containing an assessment of the groundwater quality. This report must be placed in the facility operating record and be maintained until closure of the facility.

(6) If the owners or operator determines, based on the results of the first determination under paragraph (d)(4) of this Section, that no hazardous waste or hazardous waste constituents from the facility have entered the groundwater, then he may reinstate the indicator evaluation program described in Section 265.92 and paragraph (b) of this Section. If the owner or operator reinstates the indicator evaluation program, he must so notify the Department in the report submitted under paragraph (d)(5) of this Section.

(7) If the owner or operator determines, based on the first determination under paragraph (d)(4) of this Section, that hazardous waste or hazardous waste constituents from the facility have entered the groundwater, then he:

(i) Must continue to make the determinations required under paragraph (d)(4) of this Section on a quarterly basis until final closure of the facility, if the groundwater quality assessment plan was implemented prior to final closure of the facility; or

(ii) May cease to make the determinations required under paragraph (d)(4) of this Section, if the groundwater quality assessment plan was implemented during the post-closure care period.

(e) Notwithstanding any other provision of this Subpart, any groundwater quality assessment to satisfy the requirements paragraph 265.93(d)(4) which is initiated prior to final closure of the facility must be completed and reported in accordance with paragraph 265.93(d)(5).

(f) Unless the groundwater is monitored to satisfy the requirements of paragraph 265.93(d)(4), at least annually the owner or operator must evaluate the data on groundwater surface elevations obtained under paragraph 265.92(e) to determine whether the requirements under paragraph 265.91(a) for locating the monitoring wells continues to be satisfied. If the evaluation shows that paragraph 265.91(a) is no longer satisfied, the owner or operator must immediately modify the number, location, or depth of the monitoring wells to bring the groundwater monitoring system into compliance with this requirement.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.94. Recordkeeping and reporting.

(a) Unless the groundwater is monitored to satisfy the requirements of paragraph 265.93(d)(4) the owner or operator must:

(1) Keep records of the analyses required in Section 265.92(c) and (d), the associated groundwater surface elevations required in Section 265.92(e), and the evaluations required in Section 265.93(b) throughout the active life of the facility, and, for disposal facilities, throughout the post-closure care period as well; and

(2) Report the following groundwater monitoring information to the Department:

(i) During the first year when initial background concentrations are being established for the facility: concentrations or values of the parameters listed in paragraph 265.92(b)(1) for each

groundwater monitoring well within 15 days after completing each quarterly analysis. The owner or operator must separately identify for each monitoring well any parameters whose concentration or value has been found to exceed the maximum contaminant levels listed in Appendix III.

(ii) Annually: concentrations or values of the parameters listed in paragraph 265.92(b)(3), for each groundwater monitoring well, along with the required evaluations for these parameters under paragraph 265.93(b). The owner or operator must separately identify any significant differences from initial background found in the upgradient wells, in accordance with paragraph 265.93(c)(1). During the active life of the facility, this information must be submitted no later than March 1 following each calendar year.

(iii) No later than March 1 following each calendar year: Results of the evaluations of groundwater surface elevations under paragraph 265.93(f), and a description of the response to that evaluation, where applicable.

(b) If the groundwater is monitored to satisfy the requirements of paragraph 265.93(d)(4) the owner or operator must:

(1) Keep records of the analyses and evaluations specified in the plan, which satisfies the requirements of paragraph 265.93(d)(3), throughout the active live of the facility, and, for disposal facilities, throughout the post-closure care period as well; and

(2) Annually, until final closure of the facility, submit to the Department a report containing the results of the groundwater quality assessment program which includes, but is not limited to, the calculated (or measured) rate of migration of hazardous waste or hazardous waste constituents in the groundwater during the reporting period. This information must be submitted no later than March 1 following each calendar year.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

SUBPART G Closure and Post Closure

265.110. Applicability.

Except as 265.1 provides otherwise:

(a) Sections 265.111 through 265.115 (which concern closure) apply to the owners and operators of all hazardous waste management facilities; and

(b) Sections 265.116 through 265.120 (which concern postclosure care) apply to the owners and operators of: (amended 11/90)

(1) All hazardous waste disposal facilities;

(2) Waste piles and surface impoundments for which the owner or operator intends to remove the wastes at closure to the extent that these sections are made applicable to such facilities in 265.228 or 265.258; (amended 11/90)

(3) Tank systems that are required under section 265.197 to meet requirements for landfills; and (amended 11/90)

(4) Containment building that are required under 265.1102 to meet the requirement for landfills.

(c) [Reserved]

(d) The Department may replace all or part of the requirements of this subpart (and the unit-specific standards in 265.111(c)) applying to a regulated unit (as defined in 264.90), with alternative requirements for closure set out in an approved closure or post-closure plan, where the Department determines that:

(1) A regulated unit is situated among solid waste management units (or areas of concern), a release has occurred, and both the regulated unit and one or more solid waste management unit(s) (or areas of concern) are likely to have contributed to the release, and

(2) It is not necessary to apply the closure requirements of this subpart (and/or those referenced herein) because the alternative requirements will protect human health and the environment, and will satisfy the closure performance standard of 265.111(a) and (b).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000.

265.111. Closure performance standard.

The owner or operator must close the facility in a manner that:

- (a) Minimizes the need for further maintenance; and
- (b) Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, postclosure escape of hazardous waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere; and
- (c) Complies with the closure requirements of this subpart, including, but not limited to, the requirements of sections 265.197, 265.228, 265.258, 265.280, 265.310, 265.351, 265.381, and 265.404, and 265.1102.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.112. Closure plan; amendment of plan.

(a) Written plan. The owner or operator of a hazardous waste management facility must have a written closure plan. Until final closure is completed and certified in accordance with Section 265.115, a copy of the most current plan must be furnished to the Department upon request, including request by mail. In addition, for facilities without approved plans, it must also be provided during site inspections, on the day of inspection, to any officer, employee or representative of the Department.

(b) Content of plan. The plan must identify steps necessary to perform partial and/or final closure of the facility at any point during its active life. The closure plan must include, at least:

(1) A description of how each hazardous waste management unit at the facility will be closed in accordance with Section 265.111; and

(2) A description of how final closure of the facility will be conducted in accordance with section 265.111. The description must identify the maximum extent of the operations which will be unclosed during the active life of the facility; and

(3) An estimate of the maximum inventory of hazardous wastes ever onsite over the active life of the facility and a detailed description of the methods to be used during partial and final closure, including, but not limited to, methods for removing, transporting, treating, storing, or disposing of all hazardous waste, identification of and the type(s) of offsite hazardous waste management unit(s) to be used, if applicable; and

(4) A detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils during partial and final closure including, but not limited to, procedures for cleaning equipment and removing contaminated soils, methods for sampling and testing surrounding soils, and criteria for determining the extent of decontamination necessary to satisfy the closure performance standard; and

(5) A detailed description of other activities necessary during the partial and final closure periods to ensure that all partial closures and final closure satisfy the closure performance standards, including, but not limited to, groundwater monitoring, leachate collection, and run-on and run-off control; and

(6) A schedule for closure of each hazardous waste management unit and for final closure of the facility. The schedule must include, at a minimum, the total time required to close each hazardous waste management unit and the time required for intervening closure activities which will allow tracking of the progress of partial and final closure. (For example, in the case of a landfill unit, estimates of the time required to treat or dispose of all hazardous waste inventory and of the time required to place a final cover must be included.); and

(7) An estimate of the expected year of final closure for facilities that use trust funds to demonstrate financial assurance under Sections 265.143 or 265.145 and whose remaining operating life is less than twenty years, and for facilities without approved closure plans.

(8) For facilities where the Department has applied alternative requirements at a regulated unit under 265.90(f), and/or 265.110(d), the alternative requirements applying to the regulated unit.

(c) Amendment of plan. The owner or operator may amend the closure plan at any time prior to the notification of partial or final closure of the facility. An owner or operator with an approved closure plan must submit a written request to the Department to authorize a change to the approved closure plan. The written request must include a copy of the amended closure plan for approval by the Department.

(1) The owner or operator must amend the closure plan whenever:

- (i) Changes in operating plans or facility design affect the closure plan, or
- (ii) There is a change in the expected year of closure, if applicable, or
- (iii) In conducting partial or final closure activities unexpected events require a modification of the closure plan.
- (iv) The owner or operator requests the Department to apply alternative requirements to a regulated unit under 265.90(f), and/or 265.110(d).

(2) The owner or operator must amend the closure plan at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the closure plan. If an unexpected event occurs during the partial or final closure period, the owner or operator must amend the closure plan no later than 30 days after the unexpected event. These provisions also apply to owners or operators of surface impoundments and waste piles who intended to remove all hazardous wastes at closure, but are required to close as landfills in accordance with Section 265.310.

(3) An owner or operator with an approved closure plan must submit the modified plan to the Department at least 60 days prior to the proposed change in facility design or operation, or no more than 60 days after an unexpected event has occurred which has affected the closure plan. If an unexpected event has occurred during the partial or final closure period, the owner or operator must submit the modified plan no more than 30 days after the unexpected event. These provisions also apply to owners or operators of surface impoundments and waste piles who intended to remove all hazardous wastes at closure but are required to close as landfills in accordance with Section 265.310. If the amendment to the plan is a Class 2 or 3 modification according to the criteria in R.61-79.270.42, the modification to the plan will be approved according to the procedures in Section 265.112(d)(4).

(4) The Department may request modifications to the plan under the conditions described in paragraph (c)(1) of this section. An owner or operator with an approved closure plan must submit the modified plan within 60 days of the request from the Department, or within 30 days if the unexpected event occurs during partial or final closure. If the amendment is considered a Class 2 or 3 modification according to the criteria in R.61-79.270.42, the modification to the plan will be approved in accordance with the procedures in Section 265.112(d)(4). (amended 11/90)

(d) Notification of partial closure and final closure.

(1) The owner or operator must submit the closure plan to the Department at least 180 days prior to the date on which he expects to begin closure of the first surface impoundment, waste pile, land treatment, or landfill unit, or final closure if it involves such a unit, whichever is earlier. The owner or operator must submit the closure plan to the Department at least 45 days prior to the date on which he expects to begin partial or final closure of a boiler or industrial furnace. The owner or operator must submit the closure plan to the Department at least 45 days prior to the date on which he expects to begin final closure of a facility with only tanks, container storage, or incinerator units. Owners or operators with approved closure plans must notify the Department in writing at least 60 days prior to the date on which he expects to begin closure of a surface impoundment, waste pile, landfill, or land treatment unit, or final closure of a facility involving such a unit. Owners or operator with approved closure plans must notify the Department in writing at least 45 days prior to the date on which he expects to begin partial or final closure of a boiler or industrial furnace. Owners or operator with approved closure plans must notify the Department in writing at least 45 days prior to the date on which he expects to begin final closure of a facility with only tanks, container storage, or incinerator units.

(2) The date when he "expects to begin closure" must be either:

- (i) Within 30 days after the date on which any hazardous waste management unit receives the known final volume of hazardous wastes or, if there is a reasonable possibility that the hazardous

waste management unit will receive additional hazardous wastes, no later than one year after the date on which the unit received the most recent volume of hazardous wastes. If the owner or operator of a hazardous waste management unit can demonstrate to the Department that the hazardous waste management unit or facility has the capacity to receive additional hazardous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable interim status requirements, the Department may approve an extension to this one-year limit (amended 11/90); or

(ii) For units meeting the requirements of 265.113(d), no later than 30 days after the date on which the hazardous waste management unit receives the known final volume of non-hazardous wastes, or if there is a reasonable possibility that the hazardous waste management unit will receive additional non-hazardous wastes, no later than one year after the date on which the unit received the most recent volume of non-hazardous wastes. If the owner or operator can demonstrate to the Department the hazardous waste management unit has the capacity to receive additional non-hazardous wastes and he has taken, and will continue to take, all steps to prevent threats to human health and the environment, including compliance with all applicable interim status requirements, Department may approve an extension to this one-year limit.

(3) The owner or operator must submit his closure plan to the Department no later than 15 days after:

(i) Termination of interim status except when a permit is issued simultaneously with termination of interim status; or

(ii) Issuance of a judicial decree or final order to cease receiving hazardous wastes or close.

(4) The Department will provide the owner or operator and the public, through a newspaper notice, the opportunity to submit written comments on the plan and request modifications to the plan no later than 30 days from the date of the notice. The Department will also, in response to a request or at his own discretion, hold a public hearing whenever such a hearing might clarify one or more issues concerning a closure plan. The Department will give public notice of the hearing at least 30 days before it occurs. (Public notice of the hearing may be given at the same time as notice of the opportunity for the public to submit written comments, and the two notices may be combined.) The Department will approve, modify, or disapprove the plan within 90 days of its receipt. If the Department does not approve the plan it shall provide the owner or operator with a detailed written statement of reasons for the refusal and the owner or operator must modify the plan or submit a new plan for approval within 30 days after receiving such written statement. The Department will approve or modify this plan in writing within 60 days. If the Department modifies the plan, this modified plan becomes the approved closure plan. The Department must assure that the approved plan is consistent with sections 265.111 through 265.115 and the applicable requirements of subpart F of this part, and 265.197, 265.228, 265.258, 265.280, 265.310, 265.351, 265.381, and 265.404, and 265.1102. A copy of the modified plan with a detailed statement of reasons for the modifications must be mailed to the owner or operator.

(e) Removal of wastes and decontamination or dismantling of equipment. Nothing in this Section shall preclude the owner or operator from removing hazardous wastes and decontaminating or dismantling equipment in accordance with the approved partial or final closure plan at any time before or after notification of partial or final closure.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997; State Register Volume 24, Issue No. 8, eff August 25, 2000.

265.113. Closure; time allowed for closure.

(a) Within 90 days after receiving the final volume of hazardous wastes, or the final volume of nonhazardous wastes if the owner or operator complies with all applicable requirements in paragraphs (d) and (e) of this section, at a hazardous waste management unit or facility, or within 90 days after approval of the closure plan, whichever is later, the owner or operator must treat, remove from the unit or facility, or dispose of onsite, all hazardous wastes in accordance with the approved closure plan. The Department may approve a longer period if the owner or operator (amended 11/90) demonstrates that: (revised 12/92)

(1)(i) The activities required to comply with this paragraph will, of necessity, take longer than 90 days to complete; or

(ii)(A) The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes or has the capacity to receive nonhazardous wastes if the facility owner or operator complies with paragraphs (d) and (e) of this section; and

(B) There is a reasonable likelihood that he or another person will recommence operation of the hazardous waste management unit or the facility within one year; and,

(C) Closure of the unit or facility would be incompatible with continued operation of the site; and,

(2) He has taken and will continue to take all steps to prevent threats to human health and the environment, including compliance with all applicable interim status requirements.

(b) The owner or operator must complete partial and final closure activities in accordance with the approved closure plan and within 180 days after receiving the final volume of hazardous wastes, or the final volume of nonhazardous wastes if the owner or operator complies with all applicable requirements in paragraphs (d) and (e) of this section, at the hazardous waste management unit or facility, or 180 days after approval of the closure plan, if that is later. The Department may approve an extension to the closure period if the owner or operator demonstrates that: (amended 11/90, 12/92)

(1)(i) The partial or final closure activities will, of necessity, take longer than 180 days to complete; or

(ii)(A) The hazardous waste management unit or facility has the capacity to receive additional hazardous wastes, or has the capacity to receive non-hazardous wastes if the facility owner or operator complies with paragraphs (d) and (e) of this section; and

(B) There is reasonable likelihood that he or another person will recommence operation of the hazardous waste management unit or the facility within one year; and (amended 11/90)

(C) Closure of the unit or facility would be incompatible with continued operation of the site; and

(2) He has taken and will continue to take all steps to prevent threats to human health and the environment from the unclosed but not operating hazardous waste management unit or facility, including compliance with all applicable interim status requirements (revised 12/92).

(c) The demonstrations referred to in paragraphs (a)(1) and (b)(1) of this section must be made as follows:

(1) The demonstrations in paragraph (a)(1) of this section must be made at least 30 days prior to the expiration of the 90-day period in paragraph (a) of this section; and

(2) The demonstration in paragraph (b)(1) of this section must be made at least 30 days prior to the expiration of the 180-day period in paragraph (b) of this section, unless the owner or operator is otherwise subject to the deadlines in paragraph (d) of this section.

(d) The Department may allow an owner or operator to receive non-hazardous wastes in a landfill, land treatment, or surface impoundment unit after the final receipt of hazardous wastes at that unit if:

(1) The owner or operator submits an amended part B application, or a part B application, if not previously required, and demonstrates that:

(i) The unit has the existing design capacity as indicated on the part A application to receive non-hazardous wastes; and

(ii) There is a reasonable likelihood that the owner or operator or another person will receive non-hazardous wastes in the unit within one year after the final receipt of hazardous wastes; and

(iii) The non-hazardous wastes will not be incompatible with any remaining wastes in the unit or with the facility design and operating requirements of the unit or facility under this part; and

(iv) Closure of the hazardous waste management unit would be incompatible with continued operation of the unit or facility; and

(v) The owner or operator is operating and will continue to operate in compliance with all applicable interim status requirements; and

(2) The part B application includes an amended waste analysis plan, groundwater monitoring and response program, human exposure assessment required under 44-56-10 et seq. and 48-1-50 et seq. and RCRA section 3019, and closure and postclosure plans, and updated cost estimates and demonstrations of financial assurance for closure and postclosure care as necessary and appropriate to reflect any changes due to the presence of hazardous constituents in the nonhazardous wastes, and changes in closure activities, including the expected year of closure if applicable under 265.112(b)(7), as a result of the receipt of nonhazardous wastes following the final receipt of hazardous wastes; and

(3) The part B application is amended, as necessary and appropriate, to account for the receipt of non-hazardous wastes following receipt of the final volume of hazardous wastes; and

(4) The part B application and the demonstrations referred to in paragraphs (d)(1) and (d)(2) of this section are submitted to the Department no later than 180 days prior to the date on which the owner or operator of the facility receives the known final volume of hazardous wastes, or no later than 90 days after the effective date of this rule in the state in which the unit is located, whichever is later.

(e) In addition to the requirements in paragraph (d) of this section, an owner or operator of a hazardous waste surface impoundment that is not in compliance with the liner and leachate collection system requirements in § 44-56-30 and 42 U.S.C. 3004(o)(1) and 3005(j)(1) or 42 U.S.C. 3004(o)(2) or (3) or 3005(j)(2), (3), (4) or (13) must: (amended 11/90; 12/92; 12/93)

(1) Submit with the part B application:

(i) A contingent corrective measures plan; and

(ii) A plan for removing hazardous wastes in compliance with paragraph (e)(2) of this section; and

(2) Remove all hazardous wastes from the unit by removing all hazardous liquids and removing all hazardous sludges to the extent practicable without impairing the integrity of the liner(s), if any.

(3) Removal of hazardous wastes must be completed no later than 90 days after the final receipt of hazardous wastes. The Department may approve an extension to this deadline if the owner or operator demonstrates that the removal of hazardous wastes will, of necessity, take longer than the allotted period to complete and that an extension will not pose a threat to human health and the environment.

(4) If a release that is a statistically significant increase (or decrease in the case of pH) in hazardous constituents over background levels is detected in accordance with the requirements in subpart F of this part, the owner or operator of the unit:

(i) Must implement corrective measures in accordance with the approved contingent corrective measures plan required by paragraph (e)(1) of this section no later than one year after detection of the release, or approval of the contingent corrective measures plan, whichever is later;

(ii) May receive wastes at the unit following detection of the release only if the approved corrective measures plan includes a demonstration that continued receipt of wastes will not impede corrective action; and

(iii) May be required by the Department to implement corrective measures in less than one year or to cease receipt of wastes until corrective measures have been implemented if necessary to protect human health and the environment.

(5) During the period of corrective action, the owner or operator shall provide annual reports to the Department describing the progress of the corrective action program, compile all groundwater monitoring data, and evaluate the effect of the continued receipt of nonhazardous wastes on the effectiveness of the corrective action.

(6) The Department may require the owner or operator to commence closure of the unit if the owner or operator fails to implement corrective action measures in accordance with the approved contingent corrective measures plan within one year as required in paragraph (e)(4) of this section, or fails to make substantial progress in implementing corrective action and achieving the facility's background levels.

(7) If the owner or operator fails to implement corrective measures as required in paragraph (e)(4) of this section, or if the Department determines that substantial progress has not been made pursuant to paragraph (e)(6) of this section he shall:

(i) Notify the owner or operator in writing that the owner or operator must begin closure in accordance with the deadline in paragraphs (a) and (b) of this section and provide a detailed statement of reasons for this determination, and

(ii) Provide the owner or operator and the public, through a newspaper notice, the opportunity to submit written comments on the decision no later than 20 days after the date of the notice.

(iii) If the Department receives no written comments, the decision will become final five days after the close of the comment period. The Department will notify the owner or operator that the decision is final, and that a revised closure plan, if necessary, must be submitted within 15 days of the final notice and that closure must begin in accordance with the deadlines in paragraphs (a) and (b) of this section.

(iv) If the Department receives written comments on the decision, he shall make a final decision within 30 days after the end of the comment period, and provide the owner or operator in writing and the public through a newspaper notice, a detailed statement of reasons for the final decision. If the Department determines that substantial progress has not been made, closure must be initiated in accordance with the deadlines in paragraphs (a) and (b) of this section.

(v) The final determinations made by the Department under paragraphs (e)(7)(iii) and (iv) of this section are not subject to administrative appeal.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.114. Disposal or decontamination of equipment, structures and soils.

During the partial and final closure periods, all contaminated equipment, structures and soils must be properly disposed of or decontaminated unless otherwise specified in Sections 265.197, 265.228, 265.258, 265.280, or 265.310. By removing any hazardous wastes or hazardous constituents during partial and final closure, the owner or operator may become a generator of hazardous waste and must handle hazardous that waste in accordance with all applicable requirements of R.61-79.262.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.115. Certification of closure.

Within 60 days of completion of closure of each hazardous waste surface impoundment, waste pile, land treatment, and landfill unit, and within 60 days of completion of final closure, the owner or operator must submit to the Department, by registered mail, a certification that the hazardous waste management unit or facility, as applicable, has been closed in accordance with the specifications in the approved closure plan. The certification must be signed by the owner or operator and by a qualified Professional Engineer. Documentation supporting the Professional Engineer's certification must be furnished to the Department upon request until he releases the owner or operator from the financial assurance requirements for closure under 265.143(h).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.116. Survey plat.

No later than the submission of the certification of closure of each hazardous waste disposal unit, the owner or operator must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department, a survey plat indicating the location and dimensions of landfill cells or other hazardous waste disposal units with respect to permanently surveyed benchmarks. This plat must be prepared and certified by a professional land surveyor. The plat filed with the local zoning authority, or the authority with jurisdiction over local land use, must contain a note,

prominently displayed, which states the owner's or operator's obligation to restrict disturbance of the hazardous waste disposal unit in accordance with the applicable R.61-79.265 Subpart G.

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.117. Postclosure care and use of property.

(a)(1) Post-closure care for each unit subject to the requirements of Sections 265.117 through 265.120 must begin after completion of closure of the unit and continue for 30 years after that date. It must consist of at least the following:

(i) Monitoring and reporting in accordance with the requirements of R.61-79.265 Subparts F, K, L, M, and N and

(ii) Maintenance and monitoring of waste containment systems as specified in Sections 265.91, 265.223, 265.280, and 265.310 of this Regulation, where applicable.

(2) Any time preceding closure of a hazardous waste management unit subject to postclosure care requirements or final closure, or any time during the postclosure period for a particular hazardous waste disposal unit, the Department may:

(i) Shorten the post-closure care period applicable to the hazardous waste management unit, or facility, if all disposal units have been closed, if it finds that the reduced period is sufficient to protect human health and the environment (e.g., leachate or groundwater monitoring results, characteristics of the hazardous wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the hazardous waste management unit or facility is secure); or

(ii) Extend the post-closure care period applicable to the hazardous waste management unit or facility if it finds that the extended period is necessary to protect human health and the environment (e.g., leachate or groundwater monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(b) The Department may require, at partial and final closure, continuation of any of the security requirements of Section 265.14 during part or all of the post-closure period when:

(1) Hazardous wastes may remain exposed after completion of partial or final closure; or

(2) Access by the public or domestic livestock may pose a hazard to human health.

(c) Post-closure use of property on or in which hazardous wastes remain after partial or final closure must never be allowed to disturb the integrity of the final cover, liner(s), or any other components of any containment system, or the function of the facility's monitoring systems, unless the Department finds that the disturbance:

(1) Is necessary to the proposed use of the property, and will not increase the potential hazard to human health or the environment; or

(2) Is necessary to reduce a threat to human health or the environment.

(d) All post-closure care activities must be in accordance with the provisions of the approved post-closure plan as specified in Section 265.118.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.118. Post-closure plan; amendment of plan.

(a) Written plan. By May 19, 1981, the owner or operator of a hazardous waste disposal unit must have a written postclosure plan. An owner or operator of a surface impoundment or waste pile that intends to remove all hazardous wastes at closure must prepare a postclosure plan and submit it to the Department within 90 days of the date that the owner or operator or the Department determines that the hazardous waste management unit or facility must be closed as a landfill, subject to the requirements of sections 265.117 through 265.120.

(b) Until final closure of the facility, a copy of the most current post-closure plan must be furnished to the Department upon request, including request by mail. In addition, for facilities without approved post-closure plans, it must also be provided during site inspections, on the day of inspection, to any officer, employee or representative of the Department. After final closure has been certified, the person

or office specified in Section 265.118(c)(3) must keep the approved post-closure plan during the post-closure period.

(c) For each hazardous waste management unit subject to the requirements of this Section, the post-closure plan must identify the activities that will be carried on after closure of each disposal unit and the frequency of these activities, and include at least:

(1) A description of the planned monitoring activities and frequencies at which they will be performed to comply with R.61-79.265 Subparts F,K,L,M, and N during the post-closure care period; and

(2) A description of the planned maintenance activities, and frequencies at which they will be performed to ensure:

(i) The integrity of the cap and final cover or other containment systems in accordance with the requirements of R.61-79.265 Subparts K,L,M, and N and

(ii) The function of the monitoring equipment in accordance with the requirements of R.61-79.265 Subparts F,K,L,M, and N and

(3) The name, address, and phone number of the person or office to contact about the hazardous waste disposal unit or facility during the post-closure care period.

(4) [Reserved]

(5) For facilities where the Department has applied alternative requirements at a regulated unit under 265.90(f), and/or 265.110(d), the alternative requirements that apply to the regulated unit.

(d) Amendment of plan. The owner or operator may amend the post-closure plan any time during the active life of the facility or during the post-closure care period. An owner or operator with an approved post-closure plan must submit a written request to the Department to authorize a change to the approved plan. The written request must include a copy of the amended post-closure plan for approval by the Department.

(1) The owner or operator must amend the post-closure plan whenever:

(i) Changes in operating plans or facility design affect the post-closure plan, or

(ii) Events which occur during the active life of the facility, including partial and final closures, affect the post-closure plan.

(iii) The owner or operator requests the Department to apply alternative requirements to a regulated unit under 265.90(f), and/or 265.110(d).

(2) The owner or operator must amend the post-closure plan at least 60 days prior to the proposed change in facility design or operation, or no later than 60 days after an unexpected event has occurred which has affected the post-closure plan.

(3) An owner or operator with an approved postclosure plan must submit the modified plan to the Department at least 60 days prior to the proposed change in facility design or operation, or no more than 60 days after an unexpected event has occurred which has affected the postclosure plan. If an owner or operator of a surface impoundment or a waste pile who intended to remove all hazardous wastes at closure in accordance with Sections 265.228(b) or 265.258(a) is required to close as a landfill in accordance with Section 265.310, the owner or operator must submit a postclosure plan within 90 days of the determination by the owner or operator or Department that the unit must be closed as a landfill. If the amendment to the postclosure plan is a Class 2 or 3 modification according to the criteria in Section 270.42, the modification to the plan will be approved according to the procedures in Section 265.118(f).

(4) The Department may request modifications to the plan under the conditions described in paragraph (d)(1) of this section. An owner or operator with an approved postclosure plan must submit the modified plan no later than 60 days of the request from the Department. If the amendment to the postclosure plan is considered a Class 2 or 3 modification according to the criteria in R.61-79.270.42, the modifications to the postclosure plan will be approved in accordance with the procedures in Section 265.18(f). If the Department determines that an owner or operator of a surface impoundment or waste pile who intended to remove all hazardous wastes at closure must close the facility as a landfill, the owner or operator must submit a postclosure plan for approval to the Department within 90 days of the determination. (amended 11/90)

(e) The owner or operator of a facility with hazardous waste management units subject to these requirements must submit his post-closure plan to the Department at least 180 days before the date he expects to begin partial or final closure of the first hazardous waste disposal unit. The date he “expects to begin closure” of the first hazardous waste disposal unit must be either within 30 days after the date on which the hazardous waste management unit receives the known final volume of hazardous waste or, if there is a reasonable possibility that the hazardous waste management unit will receive additional hazardous wastes, no later than one year after the date on which the unit received the most recent volume of hazardous wastes. The owner or operator must submit the post-closure plan to the Department no later than 15 days after:

(1) Termination of interim status (except when a permit is issued to the facility simultaneously with termination of interim status); or

(2) Issuance of a judicial decree or final orders under 3008 of RCRA to cease receiving wastes or close.

(f) The Department will provide the owner or operator and the public, through a newspaper notice, the opportunity to submit written comments on the post-closure plan and request modifications to the plan no later than 30 days from the date of the notice. The Department will also, in response to a request or at its own discretion, hold a public hearing whenever such a hearing might clarify one or more issues concerning a post-closure plan. The Department will give public notice of the hearing at least 30 days before it occurs. [Public notices of the hearing may be given at the same time as notice of the opportunity for the public to submit written comments, and the two notices may be combined.] The Department will approve, modify, or disapprove the plan within 90 days of its receipt. If the Department does not approve the plan it shall provide the owner or operator with a detailed written statement or reasons for the refusal and the owner or operator must modify the plan or submit a new plan for approval within 30 days after receiving such written statement. The Department will approve or modify this plan in writing within 60 days. If the Department modifies the plan, this modified plan becomes the approved post-closure plan. The Department must ensure that the approved post-closure plan is consistent with Sections 265.117 through 265.120. A copy of the modified plan with a detailed statement of reasons for the modifications must be mailed to the owner or operator.

(g) The post-closure plan and length of the post-closure care period may be modified any time prior to the end of the post-closure care period in either of the following two ways:

(1) the owner or operator or any member of the public may petition the Department to extend or reduce the post-closure care period applicable to a hazardous waste management unit or facility based on cause, or alter the requirements of the post-closure care period based on cause.

(i) The petition must include evidence demonstrating that:

(A) The secure nature of the hazardous waste management unit or facility makes the post-closure care requirement(s) unnecessary or supports reduction of the post-closure care period specified in the current post-closure plan (e.g., leachate or groundwater monitoring results, characteristics of the wastes, application of advanced technology, or alternative disposal, treatment, or re-use techniques indicate that the facility is secure), or

(B) The requested extension in the post-closure care period or alteration of post-closure care requirements is necessary to prevent threats to human health and the environment (e.g., leachate or groundwater monitoring results indicate a potential for migration of hazardous wastes at levels which may be harmful to human health and the environment).

(ii) These petitions will be considered by the Department only when they present new and relevant information not previously considered by the Department. Whenever the Department is considering a petition, it will provide the owner or operator and the public, through a newspaper notice, the opportunity to submit written comments within 30 days of the date of the notice, The Department will also, in response to a request or at its own discretion, hold a public hearing whenever a hearing might clarify one or more issues concerning the post-closure plan. The Department will give the public notice of the hearing at least 30 days before it occurs. [Public notice of the hearing may be given at the same time as notice of the opportunity for written public comments, and the two notices may be combined.] After considering the comments, the Department will issue a final determination, based upon the criteria set forth in paragraph (g)(1) above of this section.

(iii) If the Department denies the petition, it will send the petitioner a brief written response giving a reason for the denial.

(2) The Department may tentatively decide to modify the post-closure plan if it deems it necessary to prevent threats to human health and the environment. The Department may propose to extend or reduce the post-closure care period applicable to a hazardous waste management unit or facility based on cause or alter the requirements of the post-closure care period based on cause.

(i) The Department will provide the owner or operator and the affected public, through a newspaper notice, the opportunity to submit written comments within 30 days of the date of the notice and the opportunity for a public hearing as in subparagraph (g)(1)(ii) of this section. After considering the comments, it will issue a final determination.

(ii) The Department will base its final determination upon the same criteria as required for petitions under paragraph (g)(1)(i) above of this section. A modification of the post-closure plan may include, where appropriate, the temporary suspension rather than permanent deletion of one or more post-closure care requirements. At the end of the specified period of suspension, the Department would then determine whether the requirement(s) should be permanently discontinued or reinstated to prevent threats to human health and the environment.

(h) The post-closure plan for each unit of a facility managing hazardous waste must include an estimate with justifying documentation of how long the facility shall be expected to meet the desired minimum technology requirements after closure.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001.

265.119. Postclosure notices.

(a) No later than 60 days after certification of closure of each hazardous waste disposal unit, the owner or operator must submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department a record of the type, location, and quantity of hazardous wastes disposed of within each cell or other disposal unit of the facility. For hazardous wastes disposed of before January 12, 1981, the owner or operator must identify the type, location and quantity of the hazardous wastes to the best of his knowledge and in accordance with any records he has kept.

(b) Within 60 days of certification of closure of the first hazardous waste disposal unit and within 60 days of certification of closure of the last hazardous waste disposal unit, the owner or operator must:

(1) Record, in accordance with State law, a notation on the deed to the facility property-or on some other instrument which is normally examined during title search-that will in perpetuity notify any potential purchaser of the property that:

(i) The land has been used to manage hazardous wastes; and

(ii) Its use is restricted under R.61-79.265, subpart G regulations; and

(iii) The survey plat and record of the type, location, and quantity of hazardous wastes disposed of within each cell or other hazardous waste disposal unit of the facility required by Sections 265.116 and 265.119(a) have been filed with the local zoning authority or the authority with jurisdiction over local land use and with the Department; and

(2) Submit a certification, signed by the owner or operator, that he has recorded the notation specified in paragraph (b)(1) of this Section, and a copy of the document in which the notation has been placed, to the Department.

(c) If the owner or operator or any subsequent owner of the land upon which a hazardous waste disposal unit was located wishes to remove hazardous wastes and hazardous waste residues, the liner, if any, and all contaminated structures, equipment, and soils, he must request a modification to the approved postclosure plan in accordance with the requirements of section 265.118(g). The owner or operator must demonstrate that the removal of hazardous wastes will satisfy the criteria of 265.117(c) by removing hazardous waste, the owner or operator may become a generator of hazardous waste and must manage it in accordance with all applicable requirements of this chapter. If the owner or operator

is granted approval to conduct the removal activities, the owner or operator may request that the Department approve either: (amended 11/90)

- (1) The removal of the notation on the deed to the facility property or other instrument normally examined during title search; or
- (2) The addition of a notation to the deed or instrument indicating the removal of the hazardous waste.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.120. Certification of completion of post-closure care.

No later than 60 days after the completion of the established postclosure care period for each hazardous waste disposal unit, the owner or operator must submit to the Department, by registered mail, a certification that the postclosure care period for the hazardous waste disposal unit was performed in accordance with the specifications in the approved postclosure plan. The certification must be signed by the owner or operator and a qualified Professional Engineer. Documentation supporting the Professional Engineer's certification must be furnished to the Department upon request until he releases the owner or operator from the financial assurance requirements for postclosure care under 265.145(h).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 32, Issue No. 6, eff June 27, 2008.

SUBPART H

Financial Requirements Bonds, or Insurance Policies

265.140. Applicability.

(a) The requirements of sections 265.142, 265.143 and 265.147 through 265.150 apply to owners or operators of all hazardous waste facilities, except as provided otherwise in this section or in section 265.1.

(b) The requirements of sections 265.144 and 265.145 apply only to owners and operators of: (12/93)

- (1) Disposal facilities;
- (2) Tank systems that are required under section 265.197 to meet the requirements for landfills; and (12/93)
- (3) Containment buildings that are required under 265.1102 to meet the requirements for landfills. (12/93)

(c) State and the Federal government are exempt from the requirements of this subpart.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 28, Issue No. 6, eff June 25, 2004.

265.141. Definitions of terms as used in this subpart.

(a) "Closure plan" means the plan for closure prepared in accordance with the requirements of Section 265.112 of Subpart G.

(b) "Current closure cost estimate" means the most recent of the estimates prepared in accordance with Section 265.142 (a), (b), and (c).

(c) "Current post-closure cost estimate" means the most recent of the estimates prepared in accordance with Section 265.144 (a), (b), and (c).

(d) "Parent corporation" means a corporation which directly owns at least 50 percent of the voting stock of the corporation which is the facility owner or operator; the latter corporation is deemed a "subsidiary" of the parent corporation.

(e) "Post-closure plan" means the plan for post-closure care prepared in accordance with the requirements of Subpart G, Sections 265.117 through 265.120.

(f) The following terms are used in the specifications for the financial tests for closure, postclosure care, and liability coverage. The definitions are intended to assist in the understanding of these regulations and are not intended to limit the meanings of terms in a way that conflicts with generally accepted accounting practices.

“Assets” means all existing and all probably future economic benefits obtained or controlled by a particular entity.

“Current assets” means cash or other assets or resources commonly identified as those which are reasonably expected to be realized in cash or sold or consumed during the normal operating cycle of the business.

“Current liabilities” means obligations whose liquidation is reasonably expected to require the use of existing resources properly classifiable as current assets or the creation of other current liabilities.

“Current plugging and abandonment cost estimate” means the most recent of the estimates prepared in accordance with § 44-56-10 et seq. 144.62(a), (b), and (c) of this title. (revised 12/92)

“Independently audited” refers to an audit performed by an independent certified public accountant in accordance with generally accepted auditing standards.

“Liabilities” means probably future sacrifices of economic benefits arising from present obligations to transfer assets or provide services to other entities in the future as a result of past transactions or events.

“Net working capital” means current assets minus current liabilities.

“Net worth” means total assets minus total liabilities and is equivalent to owner’s equity.

“Tangible net worth” means the tangible assets that remain after deducting liabilities; such assets would not include intangibles such as goodwill and rights to patents or royalties.

(g) In the liability insurance requirements, the terms “bodily injury” and “property damage” shall have the meanings given these terms by applicable State law. However, these terms do not include those liabilities which, consistent with standard industry practices, are excluded from coverage in liability policies for bodily injury and property damage. The Agency intends the meanings of other terms used in the liability insurance requirements to be consistent with their common meanings within the insurance industry. The definitions given below of several of the terms are intended to assist in the understanding of these regulations and are not intended to limit their meanings in a way that conflicts with general insurance industry usage.

“Accidental occurrence” means an accident, including continuous or repeated exposure to conditions, which results in bodily injury or property damage neither expected nor intended from the standpoint of the insured.

“Legal defense costs” means any expenses that an insurer incurs in defending against claims of third parties brought under the terms and conditions of an insurance policy.

“Nonsudden accidental occurrence” means an occurrence which takes place over time and involves continuous or repeated exposure.

“Sudden accidental occurrence” means an occurrence which is not continuous or repeated in nature.

(h) “Substantial business relationship” means the extent of a business relationship necessary under applicable State law to make a guarantee contract issued incident to that relationship valid and enforceable. A “substantial business relationship” must arise from a pattern of recent or ongoing business transactions, in addition to the guarantee itself, such that a currently existing business relationship between the guarantor and the owner or operator is demonstrated to the satisfaction of the Department.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff November 27, 1988; State Register Volume 14, issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.142. Cost estimate for closure.

(a) The owner or operator must have a detailed written estimate, in current dollars, of the cost of closing the facility in accordance with the requirements in sections 265.111 through 265.115 and

applicable closure requirements in sections 265.197, 265.228, 265.258, 265.280, 265.310, 265.351, 265.381, 265.404, and 265.1102.

(1) The estimate must equal the cost of final closure at the point in the facility's active life when the extent and manner of its operation would make closure the most expensive, as indicated by its closure plan. [See Section 265.112(b)]; and

(2) The closure cost estimate must be based on the costs to the owner or operator of hiring a third party to close the facility. A third party is a party who is neither a parent nor a subsidiary of the owner or operator. (See definition of parent corporation in Section 265.141(d).) The owner operator may use costs for onsite disposal if he can demonstrate that onsite disposal capacity will exist at all times over the life of the facility.

(3) The closure cost estimate may not incorporate any salvage value that may be realized by the sale of hazardous wastes or non-hazardous wastes, if applicable under 265.113(d), facility structures or equipment, land or other assets associated with the facility at the time of partial or final closures.

(4) The owner or operator may not incorporate a zero cost for hazardous wastes or nonhazardous wastes if applicable under section 265.113(d) that might have economic value.

(b) During the active life of the facility, the owner or operator must adjust the closure cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with section 265.143. For owners and operators using the financial test or corporate guarantee, the closure cost estimate must be updated for inflation within 30 days after the close of the firm's fiscal year and before submission of updated information to the Department as specified in section 265.143(e)(3). The adjustment may be made by recalculating the closure cost estimate in current dollars or by using an inflation factor derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its *Survey of Current Business*, as specified in paragraphs (b)(1) and (b)(2) of this section. The inflation factor is the result of dividing the latest published annual Deflator by the Deflator for the previous year.

(1) The first adjustment is made by multiplying the closure cost estimate by the inflation factor. The result is the adjusted closure cost estimate.

(2) Subsequent adjustments are made by multiplying the latest adjusted closure cost estimate by the latest inflation factor.

(c) During the active life of the facility the owner or operator must revise the closure cost estimate no later than 30 days after a revision has been made to the closure plan which increases the cost of closure. If the owner or operator has an approved closure plan, the closure cost estimate must be revised no later than 30 days after the Department has approved the request to modify the closure plan, if the change in the closure plan increases the cost of closure. The revised closure cost estimate must be adjusted for inflation as specified in Section 265.142(b).

(d) The owner or operator must keep the following at the facility during the operating life of the facility: The latest closure cost estimate prepared in accordance with Section 265.142(a) and (c) and, when this estimate has been adjusted in accordance with Section 265.142(b), the latest adjusted closure cost estimate.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.143. Financial assurance for closure.

By the effective date of these regulations, an owner or operator of each facility must establish financial assurance for closure of the facility. He must choose from the options as specified in paragraphs (a) through (e). (amended 5/93)

(a) Standby trust fund.

(1) An owner or operator may satisfy the requirements of this section by establishing a standby trust fund which conforms to the requirements of this paragraph and submitting an originally signed duplicate of the trust agreement to the Department. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(2) The wording of the trust agreement must be identical to the wording specified in R.61-79.264.151(a)(1), and the trust agreement must be accompanied by a formal certification of acknowledgment [for example, see R.61-79.264.151(b)]. Schedule A of the trust agreement must be updated within 60 days after a change in the amount of the current closure cost estimate covered by the agreement.

(3) [Reserved]

(4) [Reserved]

(5) [Reserved]

(6) Whenever the current closure cost estimate changes, the owner or operator must compare the new estimate with the trustee's most recent annual valuation of the trust fund. If the value of the fund is less than the amount of the new estimate, the owner or operator, within 60 days after the change in the cost estimate, must either deposit an amount into the fund so that its value after this deposit at least equals the amount of the current closure cost estimate, or obtain other financial assurance as specified in this section to cover the difference.

(7) If the value of the trust fund is greater than the total amount of the current closure cost estimate, the owner or operator may submit a written request to the Department for release of the amount in excess of the current closure cost estimate.

(8) If an owner or operator substitutes other financial assurance as specified in this section for all or part of the trust fund, he may submit a written request to the Department for release of the amount in excess of the current closure cost estimate covered by the trust fund.

(9) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraphs (a)(7) or (8) of this section, the Department will instruct the trustee to release to the owner or operator such funds as the Department specifies in writing.

(10) After beginning partial or final closure, an owner or operator or another person authorized to conduct partial or final closure may request reimbursements for partial or final closure expenditures by submitting itemized bills to the Department. The owner or operator may request reimbursements for partial closure only if sufficient funds are remaining in the trust fund to cover the maximum costs of closing the facility over its remaining operating life. No later than 60 days after receiving bills for partial or final closure activities, the Department will instruct the trustee to make reimbursements in those amounts as the Department specifies in writing, if the Department determines that the partial or final closure expenditures are in accordance with the approved closure plan, or otherwise justified. If the Department has reason to believe that the maximum cost of closure over the remaining life of the facility will be significantly greater than the value of the trust fund, it may withhold reimbursements of such amounts as it deems prudent until it determines, in accordance with 265.143(h) that the owner or operator is no longer required to maintain financial assurance for final closure of the facility. If the Department does not instruct the trustee to make such reimbursements it will provide to the owner or operator a detailed written statement of reasons.

(11) The Department will agree to termination of the trust when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section;
or

(ii) The Department releases the owner or operator from the requirements of this section in accordance with section 265.143(h).

(b) Surety bond guaranteeing payment into a closure trust fund.

(1) An owner or operator may satisfy the requirements of this section by obtaining a surety bond which conforms to the requirements of this paragraph and submitting the bond to the Department. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury and be licensed to do business in South Carolina.

(2) The wording of the surety bond must be identical to the wording specified in section 264.151(b).

(3) The owner or operator who uses a surety bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all payments made

thereunder will be deposited by the surety directly into the standby trust fund in accordance with instructions from the Department. This standby trust fund must meet the requirements specified in Section 265.143(a), except that:

- (i) An originally signed duplicate of the trust agreement must be submitted to the Department with the surety bond; and
 - (ii) Until the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:
 - (A) Payments into the trust fund as specified in Section 265.143(a);
 - (B) Updating of Schedule A of the trust agreement (see Section 264.151(a)) to show current closure cost estimates;
 - (C) Annual valuations as required by the trust agreement; and
 - (D) Notices of nonpayment as required by the trust agreement.
 - (4) The bond must guarantee that the owner or operator will:
 - (i) Fund the standby trust fund in an amount equal to the penal sum of the bond before the beginning of final closure of the facility; or
 - (ii) Fund the standby trust fund in an amount equal to the penal sum within 15 days after an administrative order to begin final closure issued by the Department becomes final, or within 15 days after an order to begin final closure is issued by a U.S. district court or other court of competent jurisdiction; or
 - (iii) Provide alternate financial assurance as specified in this section, and obtain the Department's written approval of the assurance provided, within 90 days after receipt by both the owner or operator and the Department of a notice of cancellation of the bond from the surety.
 - (5) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.
 - (6) The penal sum of the bond must be in an amount at least equal to the current closure cost estimate, except as provided in Section 265.143(f).
 - (7) Whenever the current closure cost estimate increases to an amount greater than the penal sum, the owner or operator, within 60 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current closure cost estimate and submit evidence of such increase to the Department, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current closure cost estimate decreases, the penal sum may be reduced to the amount of the current closure cost estimate following written approval by the Department.
 - (8) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner or operator and to the Department. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Department, as evidence by the return receipts.
 - (9) The owner or operator may cancel the bond if the Department has given prior written consent based on his receipt of evidence of alternate financial assurance as specified in this section.
- (c) Closure Letter of Credit.
- (1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph and submitting the letter to the Department. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.
 - (2) The wording of the letter of credit must be identical to the wording specified in section 264.151(d). (revised 12/92; 5/96)
 - (3) An owner or operator who uses a letter of credit to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Department will be deposited by the issuing institution directly into the

standby trust fund in accordance with instructions from the Department. This standby trust fund must meet the requirements of the trust fund specified in Section 265.143(a), except that:

- (i) An originally signed duplicate of the trust agreement must be submitted to the Department with the letter of credit; and
 - (ii) Unless the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:
 - (A) Payments into the trust fund as specified in Section 265.143(a);
 - (B) Updating of Schedule A of the trust agreement (see R.61-79.264.151(a)) to show current closure cost estimates;
 - (C) Annual valuations as required by the trust agreement; and
 - (D) Notices of nonpayment as required by the trust agreement.
- (4) The letter of credit must be accompanied by a letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: the EPA Identification Number, name, and address of the facility, and the amount of funds assured for closure of the facility by the letter of credit.
- (5) The letter of credit must be irrevocable and issued for a period of at least 1 year. The letter of credit must provide that the expiration date will be automatically extended for a period of at least 1 year unless, at least 120 days before the current expiration date, the issuing institution notifies both the owner or operator and the Department by certified mail of a decision not to extend the expiration date. Under the terms of the letter of credit, the 120 days will begin on the date when both the owner or operator and the Department have received the notice, as evidenced by the return receipts.
- (6) The letter of credit must be issued in an amount at least equal to the current closure cost estimate, except as provided in Section 265.143(f) below.
- (7) Whenever the current closure cost estimate increases to an amount greater than the amount of the credit, the owner or operator, within 60 days after the increase, must either cause the amount of the credit to be increased so that it at least equals the current closure cost estimate and submit evidence of such increase to the Department, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current closure cost estimate decreases, the amount of the credit may be reduced to the amount of the current closure cost estimate following written approval by the Department.
- (8) Following a final administrative determination pursuant to 44-56-140 or section 3008 of RCRA that the owner or operator has failed to perform final closure in accordance with the approved closure plan and when required to do so, the Department may draw on the letter of credit.
- (9) If the owner or operator does not establish alternate financial assurance as specified in this section and obtain written approval of such alternate assurance from the Department within 90 days after receipt by both the owner or operator and the Department of a notice from issuing institution that it has decided not to extend the letter of credit beyond the current expiration date, the Department will draw on the letter of credit. The Department may delay the drawing if the issuing institution grants an extension of the term of the credit. During the last 30 days of any such extension the Department will draw on the letter of credit if the owner or operator has failed to provide alternate financial assurance as specified in this section and obtain written approval of such assurance from the Department.
- (10) The Department will return the letter of credit to the issuing institution for termination when:
- (i) An owner or operator substitutes alternate financial assurance as specified in this section; or
 - (ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.143(h).
- (d) Closure Insurance.

(1) An owner or operator may satisfy the requirements of this section by obtaining closure insurance which conforms to the requirements of this paragraph and submitting a certificate of such insurance to the Department. By the effective date of these regulations the owner or operator must submit to the Department a letter from an insurer stating that the insurer is considering issuance of closure insurance conforming to the requirements of this paragraph to the owner or operator. Within 90 days after the effective date of these regulations, the owner or operator must submit the certificate of insurance to the Department or establish other financial assurance as specified in this section. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer in South Carolina.

(2) The wording of the certificate of insurance must be identical to the wording specified in 264.151(e). (revised 12/92; 5/96)

(3) The closure insurance policy must be issued for a face amount at least equal to the current closure cost estimate, except as provided in 265.143(f). The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) The closure insurance policy must guarantee that funds will be available to close the facility whenever final closure occurs. The policy must also guarantee that once final closure begins, the insurer will be responsible for paying out funds, up to an amount equal to the face amount of the policy, upon the direction of the Department, to such party or parties as the Department specifies.

(5) After beginning partial or final closure, an owner or operator or any other person authorized to conduct closure may request reimbursements for closure expenditures by submitting itemized bills to the Department. The owner or operator may request reimbursements for partial closure only if the remaining value of the policy is sufficient to cover the maximum costs of closing the facility over its remaining operating life. Within 60 days after receiving bills for closure activities, the Department will instruct the insurer to make reimbursements in such amounts as the Department specifies in writing if the Department determines that the partial or final closure expenditures are in accordance with the approved closure plan or otherwise justified. If the Department has reason to believe that the maximum cost of closure over the remaining life of the facility will be significantly greater than the face amount of the policy, it may withhold reimbursement of such amounts as he deems prudent until he determines, in accordance with 265.143(h), that the owner or operator is no longer required to maintain financial assurance for final closure of the particular facility. If the Department does not instruct the insurer to make such reimbursements, it will provide to the owner or operator a detailed written statement of reasons.

(6) The owner or operator must maintain the policy in full force and effect until the Department consents to termination of the policy by the owner or operator as specified in paragraph (d)(10) of this section. Failure to pay the premium, without substitution of alternate financial assurance as specified in this section, will constitute a significant violation of these regulations, warranting such remedy as the Department deems necessary. Such violation will be deemed to begin upon receipt by the Department of a notice of future cancellation, termination, or failure to renew due to nonpayment of the premium, rather than upon the date of expiration.

(7) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided such consent is not unreasonably refused.

(8) The policy must provide that the insurer may not cancel, terminate, or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may elect to cancel, terminate, or fail to renew the policy by sending notice by certified mail to the owner or operator and the Department. Cancellation, termination, or failure to renew may not occur, however, during the 120 days beginning with the date of receipt of the notice by both the Department and the owner or operator, as evidenced by the return receipts. Cancellation, termination, or failure to renew may not occur and the policy will remain in full force and effect in the event that on or before the date of expiration:

(i) The Department deems the facility abandoned; or

- (ii) Interim status is terminated or revoked; or
- (iii) Closure is ordered by the Department or a State court or other court of competent jurisdiction; or
- (iv) The owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or
- (v) The premium due is paid.

(9) Whenever the current closure cost estimate increases to an amount greater than the face amount of the policy, the owner or operator, within 60 days after the increase, must either cause the face amount to be increased to an amount at least equal to the current closure cost estimate and submit evidence of such increase to the Department or obtain other financial assurance as specified in this section to cover the increase. Whenever the current closure cost estimate decreases, the face amount may be reduced to the amount of the current closure cost estimate following written approval by the Department.

(10) The Department will give written consent to the owner or operator that he may terminate the insurance policy when:

- (i) An owner or operator substitutes alternate financial assurance as specified in this section; or
- (ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.143(h).

(e) Financial Test and Corporate Guarantee for Closure.

(1) An owner or operator may satisfy the requirements of this section by demonstrating that he passes a financial test as specified in this paragraph. To pass this test the owner or operator must meet the criteria of either paragraph (e)(1)(i) or (e)(1)(ii) of this section:

- (i) The owner or operator must have:
 - (A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and
 - (B) Net working capital and tangible net worth each at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and
 - (C) Tangible net worth of at least \$10 million; and
 - (D) Assets located in the United States amounting to at least 90 percent of his total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates.

- (ii) The owner or operator must have:
 - (A) A current rating for his most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A, or Baa as issued by Moody's; and
 - (B) Tangible net worth at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and
 - (C) Tangible net worth of at least \$10 million; and
 - (D) Assets located in the United States amounting to at least 90 percent of his total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates.

(2) The phrase "current closure and postclosure cost estimates" as used in paragraph (e)(1) of this section refers to the cost estimates required to be shown in paragraphs 1 through 4 of the letter from the owner's or operator's chief financial officer (R.61-79.264.151(f)). The phrase "current plugging and abandonment cost estimates" as used in paragraph (e)(1) of this section refers to the cost estimates required to be shown in paragraphs 1 through 4 of the letter from the owner's or operator's chief financial officer 44-55-10 et seq.

(3) To demonstrate that he meets this test, the owner or operator must submit the following items to the Department:

(i) A letter signed by the owner's or operator's chief financial officer and worded as specified in R.61-79.264.151(f)(1); and (revised 12/92; 5/96)

(ii) A copy of the independent certified public accountant's report on examination of the owner's or operator's financial statements for the latest completed fiscal year; and

(iii) A special report from the owner's or operator's independent certified public accountant to the owner or operator stating that:

(A) He has compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and,

(B) In connection with that procedure, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(4) The owner or operator may obtain an extension of the time allowed for submission of the documents specified in paragraph (e)(3) of this section if the fiscal year of the owner or operator ends during the 90 days prior to the effective date of these regulations and if the year-end financial statements for that fiscal year will be audited by an independent certified public accountant. The extension will end no later than 90 days after the end of the owner's or operator's fiscal year. To obtain the extension, the owner's or operator's chief financial officer must send, by the effective date of these regulations, a letter to the Department and to each Region in which the owner's or operator's facilities to be covered by the financial test are located. This letter from the chief financial officer must;

(i) request the extension;

(ii) certify that he has grounds to believe that the owner or operator meets the criteria of the financial test;

(iii) specify for each facility to be covered by the test the EPA Identification Number, name, address, and current closure and post-closure cost estimates to be covered by the test;

(iv) specify the date ending the owner's or operator's last complete fiscal year before the effective date of these regulations;

(v) specify the date, no later than 90 days after the end of such fiscal year, when he will submit the documents specified in paragraph (e)(3) of this section; and

(vi) certify that the year-end financial statements of the owner or operator for such fiscal year will be audited by an independent certified public accountant.

(5) After the initial submission of items specified in paragraph (e)(3) of this section, the owner or operator must send updated information to the Department within 90 days after the close of each succeeding fiscal year. This information must consist of all three items specified in paragraph (e)(3) of this section.

(6) If the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, he must send notice to the Department of intent to establish alternate financial assurance as specified in this section. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year-end data show that the owner or operator no longer meets the requirements. The owner or operator must provide the alternate financial assurance within 120 days after the end of such fiscal year.

(7) The Department may, based on a reasonable belief that the owner or operator may no longer meet the requirements of paragraph (e)(1) of this section, require reports of financial condition at any time from the owner or operator in addition to those specified in paragraph (e)(3) of this section. If the Department finds, on the basis of such reports or other information, that the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of such a finding.

(8) The Department may disallow use of this test on the basis of qualifications in the opinion expressed by the independent certified public accountant in his report on examination of the owner's or operator's financial statements (see paragraph (e)(3)(ii) of this section). An adverse opinion or a disclaimer of opinion will be cause for disallowance. The Department will evaluate

other qualifications on an individual basis. The owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of the disallowance.

(9) The owner or operator is no longer required to submit the items specified in paragraph (e)(3) of this section when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.143(h).

(10) An owner or operator may meet the requirements of this section by obtaining a written guarantee. The guarantor must be the direct or higher-tier parent corporation of the owner or operator, a firm whose parent corporation is also the parent corporation of the owner or operator, or a firm with a "substantial business relationship" with the owner or operator. The guarantor must meet the requirements for owners or operators in paragraphs (e)(1) through (e)(8) of this section and must comply with the terms of the guarantee. The wording of the guarantee must be identical to the wording specified in R.61-79.264.151(h). A certified copy of the guarantee must accompany the items sent to the Department as specified in paragraph (e)(3) of this section. One of these items must be the letter from the guarantors chief financial officer. If the guarantors parent corporation is also the parent corporation of the owner or operator, the letter must describe the value received in consideration of the guarantee. If the guarantor is a firm with a "substantial business relationship" with the owner or operator, this letter must describe this "substantial business relationship" and the value received in consideration of the guarantee. The terms of the guarantee must provide that:

(i) If the owner or operator fails to perform final closure of a facility covered by the corporate guarantee in accordance with the closure plan and other interim status requirements under these regulations whenever required to do so, the guarantor will do so or establish a trust fund as specified in section 265.143(a) in the name of the owner or operator.

(ii) The corporate guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the owner or operator and to the Department. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Department, as evidenced by the return receipts.

(iii) If the owner or operator fails to provide alternate financial assurance as specified in this section and obtain the written approval of such alternate assurance from the Department within 90 days after receipt by both the owner or operator and the Department of a notice of cancellation of the corporate guarantee from the guarantor, the guarantor will provide such alternate financial assurance in the name of the owner or operator.

(f) Use of multiple financial mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility. These mechanisms are limited to surety bonds, letters of credit, and insurance. The mechanisms must be as specified in paragraphs (a) through (d), respectively, of this section, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current closure cost estimate. A single standby trust fund may be established for two or more mechanisms. The Department may use any or all of the mechanisms to provide for closure of the facility.

(g) Use of a financial mechanism for multiple facilities. An owner or operator may use a financial assurance mechanism specified in this section to meet the requirements of this section for more than one facility. Evidence of financial assurance submitted to the Department must include a list showing, for each facility, the EPA Identification Number, name, address, and the amount of funds for closure assured by the mechanism. If the facilities covered by the mechanism are in more than one State, evidence of financial assurance must be submitted to the Department clarifying how the coverage applies to each of the facilities and identical evidence of financial assurance must be submitted to and maintained with the Department and Regional Administrators of all such Regions. The amount of funds available through the mechanism must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for each facility.

In directing funds available through the mechanism for closure of any of the facilities covered by the mechanism, the Department may direct only the amount of funds designated for that facility, unless the owner or operator agrees to the use of additional funds available under the mechanism.

(h) Release of the owner or operator from the requirements of this section. Within 60 days after receiving certifications from the owner or operator and a qualified Professional Engineer that final closure has been completed in accordance with the approved closure plan, the Department will notify the owner or operator in writing that he is no longer required by this section to maintain financial assurance for final closure of the facility, unless the Department has reason to believe that final closure has not been in accordance with the approved closure plan. The Department shall provide the owner or operator a detailed written statement of any such reason to believe that closure has not been in accordance with the approved closure plan.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.144. Cost estimate for post-closure.

(a) The owner or operator of a hazardous waste disposal unit must have a written detailed estimate in current dollars, of the annual cost of post-closure monitoring and maintenance of the facility in accordance with the applicable post-closure regulations in Sections 265.117 through 265.120, 265.228, 265.258, 265.280 and 265.310.

(1) The post-closure cost estimate must be based on the costs to the owner or operator of hiring a third party to conduct post-closure care activities. A third party is a party who is neither a parent nor subsidiary of the owner or operator. (See definition of parent corporation in Section 265.141(d).

(2) The post-closure cost estimate is calculated by multiplying the annual post-closure cost estimate by the number of years of post-closure care required under Section 265.117.

(b) During the active life of the facility and during the postclosure period of the facility, the owner or operator must adjust the postclosure cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with section 265.145. For owners or operators using the financial test or corporate guarantee, the postclosure care cost estimate must be updated for inflation no later than 30 days after the close of the firm's fiscal year and before submission of updated information to the Department as specified in section 265.145(d)(5). The adjustment may be made by recalculating the postclosure cost estimate in current dollars or by using an inflation factor derived from the most recent Implicit Price Deflator for Gross National Product published by the U.S. Department of Commerce in its Survey of Current Business as specified in section 265.145(b)(1) and (b)(2). The inflation factor is the result of dividing the latest published annual Deflator by the Deflator for the previous year.

(1) The first adjustment is made by multiplying the postclosure cost estimate by the inflation factor. The result is the adjusted postclosure cost estimate.

(2) Subsequent adjustments are made by multiplying the latest adjusted postclosure cost estimate by the latest inflation factor.

(c) During the active life of the facility and during the postclosure period of the facility, the owner or operator must revise the postclosure cost estimate no later than 30 days after a revision to the postclosure plan which increases the cost of postclosure care. If the owner or operator has an approved postclosure plan, the postclosure cost estimate must be revised no later than 30 days after the Department has approved the request to modify the plan, if the change in the postclosure plan increases the cost of postclosure care. The revised postclosure cost estimate must be adjusted for inflation as specified in section 265.144(b).

(d)(1) The owner or operator must keep the following at the facility during the active life of the facility: the latest postclosure cost estimate prepared in accordance with section 265.144 (a) and (c) and, when this estimate has been adjusted in accordance with section 265.144(b), the latest adjusted postclosure cost estimate.

(2) During the postclosure period of the facility, the owner or operator must maintain the information specified in (d)(1) and provide it to the Department upon request.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

265.145. Financial assurance for postclosure care.

By the effective date of these Regulations, the owner or operator of a facility with a hazardous waste disposal unit must establish financial assurance for postclosure care of the disposal unit(s). He must choose from the options as specified in paragraphs (a) through (g) of this section:

(a) Standby trust fund.

(1) An owner or operator may satisfy the requirements of this section by establishing a standby trust fund which conforms to the requirements of this paragraph and submitting an originally signed duplicate of the trust agreement to the Department. The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(2) The wording of the trust agreement must be identical to the wording specified in section 264.151(a), and the trust agreement must be accompanied by a formal certification of acknowledgment (for example, see section 264.151(b)). Schedule A of the trust agreement must be updated within 60 days after a change in the amount of the current postclosure cost estimate covered by the agreement.

(3) [Reserved]

(4) [Reserved]

(5) [Reserved]

(6) Whenever the current postclosure cost estimate changes during the operating life of the facility, the owner or operator must compare the new estimate with the trustee's most recent annual valuation of the trust fund. If the value of the fund is less than the amount of the new estimate, the owner or operator, within 60 days after the change in the cost estimate, must either deposit an amount into the fund so that its value after this deposit at least equals the amount of the current postclosure cost estimate, or obtain other financial assurance as specified in this section to cover the difference.

(7) During the operating life of the facility, if the value of the trust fund is greater than the total amount of the current postclosure cost estimate, the owner or operator may submit a written request to the Department for release of the amount in excess of the current postclosure cost estimate.

(8) If an owner or operator substitutes other financial assurance as specified in this section for all or part of the trust fund, he may submit a written request to the Department for release of the amount in excess of the current postclosure cost estimate covered by the trust fund.

(9) Within 60 days after receiving a request from the owner or operator for release of funds as specified in paragraphs (a)(7) or (8) of this section, the Department will instruct the trustee to release to the owner or operator such funds as the Department specifies in writing.

(10) During the period of postclosure care, the Department may approve a release of funds if the owner or operator demonstrates to the Department that the value of the trust fund exceeds the remaining cost of postclosure care.

(11) An owner or operator or any other person authorized to conduct postclosure care may request reimbursements for postclosure expenditures by submitting itemized bills to the Department. Within 60 days after receiving bills for postclosure care activities, the Department will instruct the trustee to make reimbursements in those amounts as the Department specifies in writing, if the Department determines that the postclosure expenditures are in accordance with the approved postclosure plan or otherwise justified. If the Department does not instruct the trustee to make such reimbursements, he will provide the owner or operator with a detailed written statement of reasons.

(12) The Department will agree to termination of the trust when:

- (i) An owner or operator substitutes alternate financial assurance as specified in this section; or
 - (ii) The Department releases the owner or operator from the requirements of this section in accordance with section 265.145(h).
- (b) Surety bond guaranteeing payment into a postclosure trust fund.
- (1) An owner or operator may satisfy the requirements of this section by obtaining a surety bond which conforms to the requirements of this paragraph and submitting the bond to the Department. The surety company issuing the bond must, at a minimum, be among those listed as acceptable sureties on Federal bonds in Circular 570 of the U.S. Department of the Treasury.
 - (2) The wording of the surety bond must be identical to the wording specified in R.61-79.264.151(b). (revised 12/92; 5/96)
 - (3) The owner or operator who uses a surety bond to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the bond, all payments made thereunder will be deposited by the surety directly into the standby trust fund in accordance with instructions from the Department. This standby trust fund must meet the requirements specified in Section 265.145(a), except that:
 - (i) An originally signed duplicate of the trust agreement must be submitted to the Department with the surety bond; and
 - (ii) Until the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:
 - (A) Payments into the trust fund as specified in Section 265.145(a);
 - (B) Updating of Schedule A of the trust agreement (see R.61-79.264.151(a)) to show current post-closure cost estimates;
 - (C) Annual valuations as required by the trust agreement; and
 - (D) Notices of nonpayment as required by the trust agreement.
 - (4) The bond must guarantee that the owner or operator will:
 - (i) Fund the standby trust fund in an amount equal to the penal sum of the bond before the beginning of final closure of the facility; or
 - (ii) Fund the standby trust fund in an amount equal to the penal sum within 15 days after an administrative order to begin final closure issued by the Department becomes final, or within 15 days after an order to begin final closure is issued by a U.S. district court, by State court, or other court of competent jurisdiction; or (revised 12/92; 12/93)
 - (iii) Provide alternate financial assurance as specified in this section, and obtain the Department's written approval of the assurance provided, within 90 days after receipt by both the owner or operator and the Department of a notice of cancellation of the bond from the surety.
 - (5) Under the terms of the bond, the surety will become liable on the bond obligation when the owner or operator fails to perform as guaranteed by the bond.
 - (6) The penal sum of the bond must be in an amount at least equal to the current post-closure cost estimate, except as provided in Section 265.145(f) below.
 - (7) Whenever the current post-closure cost estimate increases to an amount greater than the penal sum, the owner or operator, within 60 days after the increase, must either cause the penal sum to be increased to an amount at least equal to the current post-closure cost estimate and submit evidence of such increase to the Department, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current post-closure cost estimate decreases, the penal sum may be reduced to the amount of the current post-closure cost estimate following written approval by the Department.
 - (8) Under the terms of the bond, the surety may cancel the bond by sending notice of cancellation by certified mail to the owner or operator and to the Department. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of cancellation by both the owner or operator and the Department, as evidenced by the return receipts.

(9) The owner or operator may cancel the bond if the Department has given prior written consent based on his receipt of evidence of alternate financial assurance as specified in this section.

(c) Post-closure letter of credit.

(1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit which conforms to the requirements of this paragraph and submitting the letter to the Department. The issuing institution must be an entity which has the authority to issue letters of credit and whose letter-of-credit operations are regulated and examined by a Federal or State agency.

(2) The wording of the letter of credit must be identical to the wording specified in R.61-79.264.151(d). (revised 12/92; 5/96)

(3) An owner or operator who uses a letter of credit to satisfy the requirements of this section must also establish a standby trust fund. Under the terms of the letter of credit, all amounts paid pursuant to a draft by the Department will be deposited by the issuing institution directly into the standby trust fund in accordance with instructions from the Department. This standby trust fund must meet the requirements of the trust fund specified in Section 265.145(a), except that:

(i) An originally signed duplicate of the trust agreement must be submitted to the Department with the letter of credit; and

(ii) Unless the standby trust fund is funded pursuant to the requirements of this section, the following are not required by these regulations:

(A) Payments into the trust fund as specified in Paragraph 265.145(a);

(B) Updating of Schedule A of the trust agreement (see R.61-79.264.151(a)) to show current post-closure cost estimates.

(C) Annual valuations as required by the trust agreement; and

(D) Notices of nonpayment as required by the trust agreement.

(4) The letter of credit must be accompanied by a letter from the owner or operator referring to the letter of credit by number, issuing institution, and date, and providing the following information: the EPA Identification Number, name, and address of the facility, and the amount of funds assured for post-closure care of the facility by the letter of credit.

(5) The letter of credit must be irrevocable and issued for a period of at least 1 year. The letter of credit must provide that the expiration date will be automatically extended for a period of at least 1 year unless, at least 120 days before the current expiration date, the issuing institution notifies both the owner or operator and the Department by certified mail of a decision not to extend the expiration date. Under the terms of the letter of credit, the 120 days will begin on the date when both the owner or operator and the Department have received the notice, as evidenced by the return receipts.

(6) The letter of credit must be issued in an amount at least equal to the current post-closure cost estimate, except as provided in Section 265.145(f).

(7) Whenever the current post-closure cost estimate increases to an amount greater than the amount of the credit during the operating life of the facility, the owner or operator, within 60 days after the increase, must either cause the amount of the credit to be increased so that it at least equals the current post-closure cost estimate and submit evidence of such increase to the Department, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current post-closure cost estimate decreases during the operating life of the facility, the amount of the credit may be reduced to the amount of the current post-closure cost estimate following written approval by the Department.

(8) During the period of post-closure care, the Department may approve a decrease in the amount of the letter of credit if the owner or operator demonstrates to the Department that the amount exceeds the remaining cost of post-closure care.

(9) Following a final administrative determination pursuant to 44-56-140 or section 3008 of RCRA that the owner or operator has failed to perform postclosure care in accordance with the approved postclosure plan and other permit requirements under these regulations, the Department may draw on the letter of credit.

(10) If the owner or operator does not establish alternate financial assurance as specified in this section and obtain written approval of such alternate assurance from the Department within 90 days after receipt by both the owner or operator and the Department of a notice from the issuing institution that it has decided not to extend the letter of credit beyond the current expiration date, the Department will draw on the letter of credit. The Department may delay the drawing if the issuing institution grants an extension of the term of the credit. During the last 30 days of any such extension the Department will draw on the letter of credit if the owner or operator has failed to provide alternate financial assurance as specified in this section and obtain written approval of such assurance from the Department.

(11) The Department will return the letter of credit to the issuing institution for termination when:

- (i) An owner or operator substitutes alternate financial assurance as specified in this section; or
- (ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.145(h).

(d) Post-closure insurance.

(1) An owner or operator may satisfy the requirements of this section by obtaining postclosure insurance which conforms to the requirements of this paragraph and submitting a certificate of such insurance to the Department. By the effective date of these regulations the owner or operator must submit to the Department a letter from an insurer stating that the insurer is considering issuance of postclosure insurance conforming to the requirements of this paragraph to the owner or operator. Within 90 days after the effective date of these regulations, the owner or operator must submit the certificate of insurance to the Department or establish other financial assurance as specified in this section. At a minimum, the insurer must be licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in the State of South Carolina.

(2) The wording of the certificate of insurance must be identical to the wording specified in R.61-79.264.151(e). (revised 12/92; 5/96)

(3) The post-closure insurance policy must be issued for a face amount at least equal to the current post-closure cost estimate, except as provided in Section 265.145(f). The term "face amount" means the total amount the insurer is obligated to pay under the policy. Actual payments by the insurer will not change the face amount, although the insurer's future liability will be lowered by the amount of the payments.

(4) The post-closure insurance policy must guarantee that funds will be available to provide post-closure care of the facility whenever the post-closure period begins. The policy must also guarantee that once post-closure care begins, the insurer will be responsible for paying out funds, up to an amount equal to the face amount of the policy, upon the direction of the Department, to such party or parties as the Department specifies.

(5) An owner or operator or any other person authorized to perform postclosure care may request reimbursement for postclosure care expenditures by submitting itemized bills to the Department. Within 60 days after receiving bills for postclosure care activities, the Department will determine whether the postclosure expenditures are in accordance with the postclosure plan or otherwise justified, and if so, he will instruct the insurer to make reimbursement in such amounts as the Department specifies in writing. If the Department does not instruct the insurer to make such reimbursements he will provide a detailed written statement of reasons.

(6) The owner or operator must maintain the policy in full force and effect until the Department consents to termination of the policy by the owner or operator as specified in paragraph (d)(11) of this section. Failure to pay the premium, without substitution of alternate financial assurance as specified in this section, will constitute a significant violation of these regulations, warranting such remedy as the Department deems necessary. Such violation will be deemed to begin upon receipt by the Department of a notice of future cancellation, termination, or failure to renew due to nonpayment of the premium, rather than upon the date of expiration.

(7) Each policy must contain a provision allowing assignment of the policy to a successor owner or operator. Such assignment may be conditional upon consent of the insurer, provided such consent is not unreasonably refused.

(8) The policy must provide that the insurer may not cancel, terminate, or fail to renew the policy except for failure to pay the premium. The automatic renewal of the policy must, at a minimum, provide the insured with the option of renewal at the face amount of the expiring policy. If there is a failure to pay the premium, the insurer may elect to cancel, terminate, or fail to renew the policy by sending notice by certified mail to the owner or operator and the Department. Cancellation, termination, or failure to renew may not occur, however, during the 120 days beginning with the date of receipt of the notice by both the Department and the owner or operator, as evidenced by the return receipts. Cancellation, termination, or failure to renew may not occur and the policy will remain in full force and effect in the event that on or before the date of expiration:

- (i) The Department deems the facility abandoned; or
- (ii) Interim status is terminated or revoked; or
- (iii) Closure is ordered by the Department or a State court or other court of competent jurisdiction; or
- (iv) The owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or
- (v) The premium due is paid.

(9) Whenever the current post-closure cost estimate increases to an amount greater than the face amount of the policy during the operating life of the facility, the owner or operator, within 60 days after the increase, must either cause the face amount to be increased to an amount at least equal to the current post-closure cost estimate and submit evidence of such increase to the Department, or obtain other financial assurance as specified in this section to cover the increase. Whenever the current post-closure cost estimate decreases during the operating life of the facility, the face amount may be reduced to the amount of the current post-closure cost estimate following written approval by the Department.

(10) Commencing on the date that liability to make payments pursuant to the policy accrues, the insurer will thereafter annually increase the face amount of the policy. Such increase must be equivalent to the face amount of the policy, less any payments made, multiplied by an amount equivalent to 85 percent of the most recent investment rate or of the equivalent coupon-issue yield announced by the U.S. Treasury for 26-week Treasury securities.

(11) The Department will give written consent to the owner or operator that he may terminate the insurance policy when:

- (i) An owner or operator substitutes alternate financial assurance as specified in this section; or
- (ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.145(h).

(e) Financial test and corporate guarantee for post-closure care.

(1) An owner or operator may satisfy the requirements of this section by demonstrating that he passes a financial test as specified in this paragraph. To pass this test the owner or operator must meet the criteria of either paragraph (e)(1)(i) or (e)(1)(ii) of this section:

- (i) The owner or operator must have:
 - (A) Two of the following three ratios: a ratio of total liabilities to net worth less than 2.0; a ratio of the sum of net income plus depreciation, depletion, and amortization to total liabilities greater than 0.1; and a ratio of current assets to current liabilities greater than 1.5; and
 - (B) Net working capital and tangible net worth each at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and
 - (C) Tangible net worth of at least \$10 million; and

(D) Assets in the United States amounting to at least 90 percent of his total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates.

(ii) The owner or operator must have:

(A) A current rating for his most recent bond issuance of the AAA, AA, A, or BBB as issued by Standard and Poor's or Aaa, Aa, A or Baa as issued by Moody's; and

(B) Tangible net worth at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates; and

(C) Tangible net worth of at least \$10 million; and

(D) Assets located in the United States amounting to at least 90 percent of his total assets or at least six times the sum of the current closure and post-closure cost estimates and the current plugging and abandonment cost estimates.

(2) The phrase "current closure and post-closure cost estimates" as used in paragraph (e)(1) of this section refers to the cost estimates required to be shown in paragraphs 1 through 4 of the letter from the owner's or operator's chief financial officer (R.61-79.264.151(f)). The phrase "current plugging and abandonment cost estimates" as used in paragraph (e)(1) of this section refers to the cost estimates required to be shown in paragraphs 1 through 4 of the letter from the owner's or operator's chief financial officer. (CFR 144.70f)

(3) To demonstrate that he meets this test, the owner or operator must submit the following items to the Department:

(i) A letter signed by the owner's or operator's chief financial officer and worded as specified in R.61-79.264.151(f); (revised 12/92; 5/96) and

(ii) A copy of the independent certified public accountant's report on examination of the owner's or operator's financial statements for the latest completed fiscal year; and

(iii) A special report from the owner's or operator's independent certified public accountant to the owner or operator stating that:

(A) He has compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

(B) In connection with that procedure, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(4) The owner or operator may obtain an extension of the time allowed for submission of the documents specified in paragraph (e)(3) of this section if the fiscal year of the owner or operator ends during the 90 days prior to effective date of these regulations and if the year-end financial statements for that fiscal year will be audited by an independent certified public accountant. The extension will end no later than 90 days after the end of the owner's or operator's fiscal year. To obtain the extension, the owner's or operator's chief financial officer must send, by the effective date of these regulations, a letter to the Department. This letter from the chief financial officer must:

(i) Request the extension;

(ii) Certify that he has grounds to believe that the owner or operator meets the criteria of the financial test;

(iii) Specify for each facility to be covered by the test the EPA Identification Number, name, address, and the current closure and post-closure cost estimates to be covered by the test;

(iv) Specify the date ending the owner's or operator's latest complete fiscal year before the effective date of these regulations;

(v) Specify the date, no later than 90 days after the end of such fiscal year, when he will submit the documents specified in paragraph (e)(3) of this section; and

(vi) Certify that the year-end financial statements of the owner or operator for such fiscal year will be audited by an independent certified public accountant.

(5) After the initial submission of items specified in paragraph (e)(3) of this section, the owner or operator must send updated information to the Department within 90 days after the close of each succeeding fiscal year. This information must consist of all three items specified in paragraph (e)(3) of this section.

(6) If the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, he must send notice to the Department of intent to establish alternate financial assurance as specified in this section. The notice must be sent by certified mail within 90 days after the end of the fiscal year for which the year-end financial data show that the owner or operator no longer meets the requirements. The owner or operator must provide the alternate financial assurance within 120 days after the end of such fiscal year.

(7) The Department may, based on a reasonable belief that the owner or operator may no longer meet the requirements of paragraph (e)(1) of this section, require reports of financial condition at any time from the owner or operator in addition to those specified in paragraph (e)(3) of this section. If the Department finds, on the basis of such reports or other information, that the owner or operator no longer meets the requirements of paragraph (e)(1) of this section, the owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of such a finding.

(8) The Department may disallow use of this test on the basis of qualifications in the opinion expressed by the independent certified public accountant in his report on examination of the owner's or operator's financial statements (see paragraph (e)(3)(ii) of this section). An adverse opinion or a disclaimer of opinion will be cause for disallowance. The Department will evaluate other qualifications on an individual basis. The owner or operator must provide alternate financial assurance as specified in this section within 30 days after notification of the disallowance.

(9) During the period of post-closure care, the Department may approve a decrease in the current post-closure cost estimate for which this test demonstrates financial assurance if the owner or operator demonstrates to the Department that the amount of the cost estimate exceeds the remaining cost of post-closure care.

(10) The owner or operator is no longer required to submit the items specified in paragraph (e)(3) above of this section when:

(i) An owner or operator substitutes alternate financial assurance as specified in this section; or

(ii) The Department releases the owner or operator from the requirements of this section in accordance with Section 265.145(h).

(11) An owner or operator may meet the requirements of this section by obtaining a written guarantee. The guarantor must be the direct or higher-tier parent corporation of the owner or operator, a firm whose parent corporation is also the parent corporation of the owner or operator, or a firm with a "substantial business relationship" with the owner or operator. The guarantor must meet the requirements for owners or operators in paragraphs (e)(1) through (9) of this section and must comply with the terms of the guarantee. The wording of the guarantee must be identical to the wording specified in R.61-79.264.151(h). A certified copy of the guarantee must accompany the items sent to the Department as specified in paragraph (e)(3) of this section. One of these items must be the letter from the guarantor's chief financial officer. If the guarantor's parent corporation is also the parent corporation of the owner or operator, the letter must describe the value received in consideration of the guarantee. If the guarantor is a firm with a "substantial business relationship" with the owner or operator, this letter must describe this "substantial business relationship" and the value received in consideration of the guarantee. The terms of the corporate guarantee must provide that:

(i) If the owner or operator fails to perform postclosure care of a facility covered by the corporate guarantee in accordance with the postclosure plan and other interim status requirements whenever required to do so, the guarantor will do so or establish a trust fund as specified in section 265.145(a) in the name of the owner or operator.

(ii) The corporate guarantee will remain in force unless the guarantor sends notice of cancellation by certified mail to the owner or operator and to the Department. Cancellation may not occur, however, during the 120 days beginning on the date of receipt of the notice of

cancellation by both the owner or operator and the Department, as evidenced by the return receipts.

(iii) If the owner or operator fails to provide alternate financial assurance as specified in this section and obtain the written approval of such alternate assurance from the Department within 90 days after receipt by both the owner or operator and the Department of a notice of cancellation of the corporate guarantee from the guarantor, the guarantor will provide such alternate financial assurance in the name of the owner or operator.

(f) Use of multiple financial mechanisms. An owner or operator may satisfy the requirements of this section by establishing more than one financial mechanism per facility. These mechanisms are limited to surety bonds guaranteeing payment into a trust fund, letters of credit, and insurance. The mechanisms must be as specified in paragraphs (b) through (d), respectively, of this section, except that it is the combination of mechanisms, rather than the single mechanism, which must provide financial assurance for an amount at least equal to the current postclosure cost estimate. If an owner or operator uses a trust fund in combination with a surety bond or a letter of credit, he may use the trust fund as the standby trust fund for the other mechanisms. A single standby trust fund may be established for two or more mechanisms. The Department may use any or all of the mechanisms to provide for postclosure care of the facility. (amended 5/93; 12/93; 5/96)

(g) Use of a financial mechanism for multiple facilities. An owner or operator may use a financial assurance mechanism specified in this section to meet the requirements of this section for more than one facility. Evidence of financial assurance submitted to the Department must include a list showing, for each facility, the EPA Identification Number, name, address, and the amount of funds for postclosure care assured by the mechanism. If the facilities covered by the mechanism are located both in State and out of state, identical evidence of financial assurance must be submitted to the Department. The amount of funds available through the mechanism must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for each facility. In directing funds available through the mechanism for postclosure care of any of the facilities covered by the mechanism, the Department may direct only the amount of funds designated for that facility, unless the owner or operator agrees to the use of additional funds available under the mechanism.

(h) Release of the owner or operator from the requirements of this section. Within 60 days after receiving certifications from the owner or operator and a qualified Professional Engineer that the postclosure care period has been completed for a hazardous waste disposal unit in accordance with the approved plan, the Department will notify the owner or operator in writing that he is no longer required to maintain financial assurance for postclosure care of that unit, unless the Department has reason to believe that postclosure care has not been in accordance with the approved postclosure plan. The Department will provide the owner or operator a detailed written statement of any such reason to believe that postclosure care has not been in accordance with the approved postclosure plan.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12 Issue No. 10 eff October, 28, 1988; State Register Volume 13, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.146. Use of a mechanism for financial assurance of both closure and post-closure care.

An owner or operator may satisfy the requirements for financial assurance for both closure and post-closure care for one or more facilities by using a trust fund, surety bond, letter of credit, insurance, financial test, or corporate guarantee that meets the specifications for the mechanism in both Sections 265.143 and 265.145. The amount of funds available through the mechanism must be no less than the sum of funds that would be available if a separate mechanism had been established and maintained for financial assurance of closure and of post-closure care.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.147. Liability requirements.

(a) Coverage for sudden accidental occurrences. An owner or operator of a hazardous waste treatment, storage, or disposal facility, or a group of such facilities, must demonstrate financial responsibility for bodily injury and property damage to third parties caused by sudden accidental occurrences arising from operations of the facility or group of facilities. The owner or operator must have and maintain liability coverage for sudden accidental occurrences in the amount of at least \$1 million per occurrence with an annual aggregate of at least \$2 million, exclusive of legal defense costs. This liability coverage may be demonstrated, as specified in paragraphs (a) (1), (2), (3), (4), (5), or (6) of this section: (amended 11/90)

(1) An owner or operator may demonstrate the required liability coverage by having liability insurance as specified in this paragraph.

(i) Each insurance policy must be amended by attachment of the Hazardous Waste Facility Liability Endorsement or evidenced by a Certificate of Liability Insurance. The wording of the endorsement must be identical to the wording specified in R. 61-79.264.151(i). The wording of the certificate of insurance must be identical to the wording specified in R. 61-79.264.151(j). The owner or operator must submit a signed duplicate original of the endorsement or the certificate of insurance to the Department and to the appropriate EPA Regional Offices where out of state facilities are also being covered. The owner or operator must provide a signed duplicate original of the insurance policy, application, and any agreements which may affect the policy.

(ii) Each insurance policy must be issued by an insurer which, at a minimum, is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in one or more States.

(2) An owner or operator may meet the requirements of this section by passing a financial test or using the guarantee for liability coverage as specified in paragraph (f) and (g) of this section. (amended 11/90)

(3) An owner or operator may meet the requirements of this section by obtaining a letter of credit for liability coverage as specified in paragraph (h) of this section.

(4) An owner or operator may meet the requirements of this section by obtaining a surety bond for liability coverage as specified in paragraph (i) of this section.

(5) An owner or operator may meet the requirements of this section by obtaining a trust fund for liability coverage as specified in paragraph (j) of this section.

(6) An owner or operator may demonstrate the required liability coverage through the use of combinations of insurance, financial test, guarantee, letter of credit, surety bond, and trust fund, except that the owner or operator may not combine a financial test covering part of the liability coverage requirement with a guarantee unless the financial statement of the owner or operator is not consolidated with the financial statement of the guarantor. The amounts of coverage demonstrated must total at least the minimum amounts required by this section. If the owner or operator demonstrates the required coverage through the use of a combination of financial assurances under this paragraph, the owner or operator shall specify at least one such assurance as "primary" coverage and shall specify other assurance as "excess" coverage.

(7) An owner or operator shall notify the Department in writing within 30 days whenever:

(i) A claim results in a reduction in the amount of financial assurance for liability coverage provided by a financial instrument authorized in paragraphs (a)(1) through (a)(6) of this section; or

(ii) A Certification of Valid Claim for bodily injury or property damages caused by a sudden or non-sudden accidental occurrence arising from the operation of a hazardous waste treatment, storage, or disposal facility is entered between the owner or operator and third-party claimant for liability coverage under paragraphs (a)(1) through (a)(6) of this section; or

(iii) A final court order establishing a judgement for bodily injury or property damage caused by a sudden or non-sudden accidental occurrence arising from the operation of a hazardous waste treatment, storage, or disposal facility is issued against the owner or operator or an instrument that is providing financial assurance for liability coverage under paragraphs (a)(1) through (1)(6) of this section.

(b) Coverage for nonsudden accidental occurrences. An owner or operator of a surface impoundment, landfill, or land treatment facility which is used to manage hazardous waste, or a group of such facilities, must demonstrate financial responsibility for bodily injury and property damage to third parties caused by nonsudden accidental occurrences arising from operations of the facility or group of facilities. The owner or operator must have and maintain liability coverage for nonsudden accidental occurrences in the amount of at least \$3 million per occurrence with an annual aggregate of at least \$6 million, exclusive of legal defense costs. An owner or operator who must meet the requirements of this section may combine the required per-occurrence coverage levels for sudden and nonsudden accidental occurrences into a single per-occurrence level, and combine the required annual aggregate coverage levels for sudden and nonsudden accidental occurrences into a single annual aggregate level. Owners or operators who combine coverage levels for sudden and nonsudden accidental occurrences must maintain liability coverage in the amount of at least \$4 million per occurrence and \$8 million annual aggregate. This liability coverage may be demonstrated as specified in paragraphs (b) (1), (2), (3), (4), (5), or (6) of this section: (amended 11/90, 12/92)

(1) An owner or operator may demonstrate the required liability coverage by having liability insurance as specified in this paragraph.

(i) Each insurance policy must be amended by attachment of the Hazardous Waste Facility Liability Endorsement or evidenced by a Certificate of Liability Insurance. The wording of the endorsement must be identical to the wording specified in R.61-79.264.151(i). The wording of the certificate of insurance must be identical to the wording specified in R.61-79.264.151(j). The owner or operator must submit a signed duplicate original of the endorsement or the certificate of insurance to the Department. If requested by the Department, the owner or operator must provide a signed duplicate original of the insurance policy.

(ii) Each insurance policy must be issued by an insurer which, at a minimum, is licensed to transact the business of insurance, or eligible to provide insurance as an excess or surplus lines insurer, in the State of South Carolina.

(2) An owner or operator may meet the requirements of this section by passing a financial test or using the guarantee for liability coverage as specified in paragraphs (f) and (g) of this section.

(3) An owner or operator may meet the requirements of this section by obtaining a letter of credit for liability coverage as specified in paragraph (h) of this section.

(4) An owner or operator may meet the requirements of this section by obtaining a surety bond for liability coverage as specified in paragraph (i) of this section.

(5) An owner or operator may meet the requirements of this section by obtaining a trust fund for liability coverage as specified in paragraph (j) of this section.

(6) An owner or operator may demonstrate the required liability coverage through the use of combinations of insurance, financial test, guarantee, letter of credit, surety bond, and trust fund, except that the owner or operator may not combine a financial test covering part of the liability coverage requirement with a guarantee unless the financial statement of the owner or operator is not consolidated with the financial statement of the guarantor. The amounts of coverage demonstrated must total at least the minimum amounts required by this section. If the owner or operator demonstrates the required coverage through the use of a combination of financial assurances under this paragraph, the owner or operator shall specify at least one such assurance as "primary" coverage and shall specify other assurance as "excess" coverage.

(7) An owner or operator shall notify the Department in writing within 30 days whenever:

(i) A claim results in a reduction in the amount of financial assurance for liability coverage provided by a financial instrument authorized in paragraphs (b)(1) through (b)(6) of this section; or

(ii) A Certification of Valid Claim for bodily injury or property damages caused by a sudden or non-sudden accidental occurrence arising from the operation of a hazardous waste treatment, storage, or disposal facility is entered between the owner or operator and third-party claimant for liability coverage under paragraphs (b)(1) through (b)(6) of this section; or

(iii) A final court order establishing a judgment for bodily injury or property damage caused by a sudden or non-sudden accidental occurrence arising from the operation of a hazardous waste treatment, storage, or disposal facility is issued against the owner or operator or an instrument

that is providing financial assurance for liability coverage under paragraphs (b)(1) through (b)(6) of this section.

(c) Request for variance. If an owner or operator can demonstrate to the satisfaction of the Department that the levels of financial responsibility required by paragraph (a) or (b) of this section are not consistent with the degree and duration of risk associated with treatment, storage, or disposal at the facility or group of facilities, the owner or operator may obtain a variance from the Department. The request for a variance must be submitted in writing to the Department. If granted, the variance will take the form of an adjusted level of required liability coverage, such level to be based on the Department's assessment of the degree and duration of risk associated with the ownership or operation of the facility or group of facilities. The Department may require an owner or operator who requests a variance to provide such technical and engineering information as is deemed necessary by the Department to determine a level of financial responsibility other than that required by paragraph (a) or (b) of this section. The Department will process a variance request as if it were a permit modification request under R. 61-79.270.41(a)(5) and subject to the procedures of R.61-79.124.5. Notwithstanding any other provision, the Department may hold a public hearing at his discretion or whenever he finds, on the basis of requests for a public hearing, a significant degree of public interest in a tentative decision to grant a variance. (amended 11/90)

(d) Adjustments by the Department. If the Department determines that the levels of financial responsibility required by paragraph (a) or (b) of this section are not consistent with the degree and duration of risk associated with treatment, storage, or disposal at the facility or group of facilities, the Department may adjust the level of financial responsibility required under paragraph (a) or (b) of this section as may be necessary to protect human health and the environment. This adjusted level will be based on the Department's assessment of the degree and duration of risk associated with the ownership or operation of the facility or group of facilities. In addition, if the Department determines that there is a significant risk to human health and the environment from nonsudden accidental occurrences resulting from the operations of a facility that is not a surface impoundment, landfill, or land treatment facility, he may require that an owner or operator of the facility comply with paragraph (b) of this section. An owner or operator must furnish to the Department, within a reasonable time, any information which the Department requests to determine whether cause exists for such adjustments of level or type of coverage. The Department will process an adjustment of the level of required coverage as if it were a permit modification under R.61-79.270.41(a)(5) and subject to the procedures of R.61-79.124.5. Notwithstanding any other provision, the Department may hold a public hearing at its discretion or whenever it finds, on the basis of requests for a public hearing, a significant degree of public interest in a tentative decision to adjust the level or type of required coverage.

(e) Period of coverage. Within 60 days after receiving certifications from the owner or operator and a qualified Professional Engineer that final closure has been completed in accordance with the approved closure plan, the Department will notify the owner or operator in writing that he is no longer required by this section to maintain liability coverage for that facility, unless the Department has reason to believe that closure has not been in accordance with the approved closure plan.

(f) Financial test for liability coverage.

(1) An owner or operator may satisfy the requirements of this section by demonstrating that he passes a financial test as specified in this paragraph. To pass this test the owner or operator must meet the criteria of paragraph (f)(1)(i) or (f)(1)(ii):

(i) The owner or operator must have:

(A) Net working capital and tangible net worth each at least six times the amount of liability coverage to be demonstrated by this test; and

(B) Tangible net worth of at least \$10 million; and

(C) Assets in the United States amounting to either: (1) at least 90 percent of his total assets; or, (2) at least six times the amount of liability coverage to be demonstrated by this test.

(ii) The owner or operator must have:

(A) A current rating for his most recent bond issuance of AAA, AA, A, or BBB as issued by Standard and Poor's, or Aaa, Aa, A, or Baa as issued by Moody's; and

(B) Tangible net worth of at least \$10 million; and

(C) Tangible net worth at least six times the amount of liability coverage to be demonstrated by this test; and

(D) Assets in the United States amounting to either: (1) at least 90 percent of his total assets; or, (2) at least six times the amount of liability coverage to be demonstrated by this test.

(2) The phrase "amount of liability coverage" as used in paragraph (f)(1) of this section refers to the annual aggregate amounts for which coverage is required under paragraphs (a) and (b) of this section.

(3) To demonstrate that he meets this test, the owner or operator must submit the following three items to the Department:

(i) A letter signed by the owner's or operator's chief financial officer and worded as specified in R.61-79.264.151(g). If an owner or operator is using the financial test to demonstrate both assurance for closure or post-closure care, as specified by Sections 264.143(f), 264.145(f), 265.143(e), and 265.145(e), and liability coverage, he must submit the letter specified in Section 264.151(g) to cover both forms of financial responsibility; a separate letter as specified in Section 264.151(f) is not required.

(ii) A copy of the independent certified public accountant's report on examination of the owner's or operator's financial statements for the latest completed fiscal year.

(iii) A special report from the owner's or operator's independent certified public accountant to the owner or operator stating that:

(A) He has compared the data which the letter from the chief financial officer specifies as having been derived from the independently audited, year-end financial statements for the latest fiscal year with the amounts in such financial statements; and

(B) In connection with that procedure, no matters came to his attention which caused him to believe that the specified data should be adjusted.

(4) The owner or operator may obtain a one-time extension of the time allowed for submission of the documents specified in paragraph (f)(3) of this section if the fiscal year of the owner or operator ends during the 90 days prior to the effective date of these regulations and if the year-end financial statements for that fiscal year will be audited by an independent certified public accountant. The extension will end no later than 90 days after the end of the owner's or operator's fiscal year. To obtain the extension, the owner's or operator's chief financial officer must send, by the effective date of these regulations, a letter to the Department. This letter from the chief financial officer must:

(i) Request the extension;

(ii) Certify that he has grounds to believe that the owner or operator meets the criteria of the financial test;

(iii) Specify for each facility to be covered by the test the EPA Identification Number, name, address, the amount of liability coverage and, when applicable, current closure and post-closure cost estimates to be covered by the test;

(iv) Specify the date ending the owner's or operator's last complete fiscal year before the effective date of these regulations;

(v) Specify the date, no later than 90 days after the end of such fiscal year, when he will submit the documents specified in paragraph (f)(3) of this section; and

(vi) Certify that the year-end financial statements of the owner or operator for such fiscal year will be audited by an independent certified public accountant.

(5) After the initial submission of items specified in paragraph (f)(3) of this section, the owner or operator must send updated information to the Department within 90 days after the close of each succeeding fiscal year. This information must consist of all three items specified in paragraph (f)(3) of this section.

(6) If the owner or operator no longer meets the requirements of paragraph (f)(1) of this section, he must obtain insurance, a letter of credit, a surety bond, a trust fund, or a guarantee for the entire amount of required liability coverage as specified in this section. Evidence of liability coverage must be submitted to the Department within 90 days after the end of the fiscal year for which the year-end financial data show that the owner or operator no longer meets the test requirements.

(7) The Department may disallow use of this test on the basis of qualifications in the opinion expressed by the independent certified public accountant in his report on examination of the owner's or operator's financial statements (see paragraph (f)(3)(ii) of this section). An adverse opinion or a disclaimer of opinion will be cause for disallowance. The Department will evaluate other qualifications on an individual basis. The owner or operator must provide evidence of insurance for the entire amount of required liability coverage as specified in this section within 30 days after notification of disallowance.

(g) Guarantee for liability coverage (revised 12/92).

(1) Subject to paragraph (g)(2) of this section, an owner or operator may meet the requirements of this section by obtaining a written guarantee, hereinafter referred to as "guarantee". The guarantor must be the direct or higher-tier parent corporation of the owner or operator, a firm whose parent corporation is also the parent corporation of the owner or operator, or a firm with a "substantial business relationship" with the owner or operator. The guarantor must meet the requirements for owners or operators in paragraphs (f)(1) through (f)(6) of this section. The wording of the guarantee must be identical to the wording specified in 264.151(h)(2) of this chapter. A certified copy of the guarantee must accompany the items sent to the Department as specified in paragraph (f)(3) of this section. One of these items must be the letter from the guarantor's chief financial officer. If the guarantor's parent corporation is also the parent corporation of the owner or operator, this letter must describe the value received in consideration of the guarantee. If the guarantor is a firm with a substantial business relationship with the owner or operator, this letter must describe this substantial business relationship and the value received in consideration of the guarantee. (amended 11/90)

(i) If the owner or operator fails to satisfy a judgment based on a determination of liability for bodily injury or property damage to third parties caused by sudden or nonsudden accidental occurrences (or both as the case may be), arising from the operation of facilities covered by this corporate guarantee, or fails to pay an amount agreed to in settlement of claims arising from or alleged to arise from such injury or damage, the guarantor will do so up to the limits of coverage.

(ii) [Deleted 11/90]

(2)(i) In the case of corporations incorporated in the United States, a guarantee may be used to satisfy the requirements of this section only if the Attorneys General or Insurance Commissioners of

(A) the State in which the guarantor is incorporated, and

(B) each State in which a facility covered by the guarantee is located have submitted a written statement to the Department that a guarantee executed as described in this section and 264.151(h)(2) is a legally valid and enforceable obligation in that State.

(ii) In the case of corporations incorporated outside the United States, a guarantee may be used to satisfy the requirements of this section only if:

(A) the non-U.S. corporation has identified a registered agent for service of process in each State in which a facility covered by the guarantee is located and in the State in which it has its principal place of business, and if

(B) the Attorney General or Insurance Commissioner of each State in which a facility covered by the guarantee is located and the State in which the guarantor corporation has its principal place of business, has submitted a written statement to the Department that a guarantee executed as described in this section and 264.151(h)(2) is a legally valid and enforceable obligation in that State.

(3) [Reserved]

(4) An owner or operator who uses a letter of credit to satisfy the requirements of this section may also establish a standby trust fund. Under the terms of such a letter of credit, all amounts paid pursuant to a draft by the trustee of the standby trust will be deposited by the issuing institution into the standby trust in accordance with instructions from the trustee. The trustee of the standby trust fund must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(h) Letter of credit for liability coverage.

(1) An owner or operator may satisfy the requirements of this section by obtaining an irrevocable standby letter of credit that conforms to the requirements of this paragraph and submitting a copy of the letter of credit to the Department.

(2) The financial institution issuing the letter of credit must be an entity that has the authority to issue letters of credit and whose letter of credit operations are regulated and examined by a Federal or State agency.

(3) The wording of the letter of credit must be identical to the wording specified in 264.151(k) of this chapter.

(i) Surety bond for liability coverage.

(1) An owner or operator may satisfy the requirements of this section by obtaining a surety bond that conforms to the requirements of this paragraph and submitting a copy of the bond to the Department.

(2) The surety company issuing the bond must be among those listed as acceptable sureties on Federal bonds in the most recent Circular 570 of the U.S. Department of the Treasury.

(3) The wording of the surety bond must be identical to the wording specified in 264.151(1) of this chapter.

(4) A surety bond may be used to satisfy the requirements of this section only if the Attorneys General or Insurance Commissioners of

(i) the State in which the surety is incorporated, and

(ii) each State in which a facility covered by the surety bond is located have submitted a written statement to the Department that a surety bond executed as described in this section and 264.151(1) of this chapter is a legally valid and enforceable obligation in that State.

(j) Trust fund for liability coverage.

(1) An owner or operator may satisfy the requirements of this section by establishing a trust fund that conforms to the requirements of this paragraph and submitting an originally signed duplicate of the trust agreement to the Department.

(2) The trustee must be an entity which has the authority to act as a trustee and whose trust operations are regulated and examined by a Federal or State agency.

(3) The trust fund for liability coverage must be funded for the full amount of the liability coverage to be provided by the trust fund before it may be relied upon to satisfy the requirements of this section. If at any time after the trust fund is created the amount of funds in the trust fund is reduced below the full amount of the liability coverage to be provided, the owner or operator, by the anniversary date of the establishment of the Fund, must either add sufficient funds to the trust fund to cause its value to equal the full amount of liability coverage to be provided, or obtain other financial assurance as specified in this section to cover the difference. For purposes of this paragraph, "the full amount of the liability coverage to be provided" means the amount of coverage for sudden and/or nonsudden occurrences required to be provided by the owner or operator by this section, less the amount of financial assurance for liability coverage that is being provided by other financial assurance mechanisms being used to demonstrate financial assurance by the owner or operator.

(4) The wording of the trust fund must be identical to the wording specified in 264.151(m) of this part.

(k) Notwithstanding any other provision of this part, an owner or operator using liability insurance to satisfy the requirements of this section may use, until October 16, 1982, a Hazardous Waste Facility Liability Endorsement or Certificate of Liability Insurance that does not certify that the insurer is licensed to transact the business of insurance, or eligible as an excess or surplus lines insurer, in one or more States.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 13, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.148. Incapacity of owners or operators, guarantors, or financial institutions.

(a) An owner or operator must notify the Department by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 days after commencement of the proceeding. A guarantor of a corporate guarantee as specified in Sections 265.143(e) and 265.145(e) must make such a notification if he is named as debtor, as required under the terms of the corporate guarantee (R. 61-79.264.151(h)).

(b) An owner or operator who fulfills the requirements of Sections 265.143, 265.145, or 265.147 by obtaining a trust fund, surety bond, letter of credit, or insurance policy will be deemed to be without the required financial assurance or liability coverage in the event of bankruptcy of the trustee or issuing institution, or a suspension or revocation of the authority of the trustee institution to act as trustee or of the institution issuing the surety bond, letter of credit, or insurance policy to issue such instruments. The owner or operator must establish other financial assurance or liability coverage within 60 days after such an event.

265.149. Hazardous Waste Contingency Fund.

The payment of fees required under §§ 44-56-160, -170, and -510 et seq. and under section 262.45, and sections 264.78 and 265.78 will be deposited in the Hazardous Waste Contingency Fund to ensure the availability of funds for contingencies rising from permitted hazardous waste landfills and to defray the costs of governmental response actions at uncontrolled hazardous waste sites. Of the fees collected pursuant to § 44-56-170(C), (D), and (E), credited to the contingency fund pursuant to § 44-56-175, thirteen percent must be held separate and distinct within the fund in a permitted site fund for the purpose of response actions arising from the operation of the permitted land disposal facilities in this State. Of the fees collected pursuant to Section 44-56-510 and credited to the contingency fund pursuant to § 44-56-175, twenty-six percent must be credited to the fund for permitted sites. (revised 12/92).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990.

SUBPART I

Use and Management of Containers

265.170. Applicability.

The regulations in this subpart apply to owners and operators of all hazardous waste facilities that store containers of hazardous waste, except as section 265.1 provides otherwise.

HISTORY: Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.171. Condition of containers.

If a container holding hazardous waste is not in good condition (e.g., severe rusting, apparent structural defects) or 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 regulation.

265.172. 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.

265.173. 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.

(c) Each container containing hazardous waste shall be permanently and legibly marked with the following or equivalent statement: "Hazardous Waste - federal laws prohibit improper disposal."

(d) Each container shall be appropriately labeled with EPA Hazardous Waste Number.

[Comment: Reuse of containers in transportation is governed by U.S. Department of Transportation regulations, including those set forth in 49 CFR 173.28.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997.

265.174. 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 caused by corrosion or other factors. See R.61-79.265.171 for remedial action required if deterioration or leaks are detected.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012; SCSR 43-5 Doc. No. 4841, eff May 24, 2019.

265.175. [Containment system].

(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) Runon 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 runon 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.

[Comment: If the collected material is a hazardous waste under 261, it must be managed as a hazardous waste in accordance with all applicable requirements of parts 262 through 266. If the collected material is discharged through a point source to waters of the United States, it is subject to the requirements of section 402 of the Clean Water Act, as amended.] (revised 12/92)

(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) FO20, FO21, FO22, FO23, FO26, and FO27.

(2) [Reserved]

(e) This section shall become effective 12 months after publication of the regulation modification in the State Register.

HISTORY: Added by State Register Volume 19, Issue No. 6, eff June 23, 1995.

265.176. Special requirements for ignitable or reactive waste.

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

[Comment: See 265.17(a) for additional requirements.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.177. Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible wastes and materials (see Appendix V for example), must not be placed in the same container, unless Section 265.17(b) is complied with.

(b) Hazardous waste must not be placed in an unwashed container that previously held an incompatible waste or material. (See Appendix V for example unless 265.17(b) is complied with.)

(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.

[Comment: The purpose of this is to prevent fires, explosions, gaseous emissions, leaching, or other discharge of hazardous waste or hazardous waste constituents which could result from the mixing of incompatible wastes or materials if containers break or leak.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.178. 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.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

SUBPART J

Tanks

265.190. 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), and (c) of this section or in section 265.1 of this part (revised 12/92).

(a) Tank systems that are used to store or treat hazardous waste which contains no free liquids and that are situated inside a building with an impermeable floor are exempted from the requirements in section 265.193. To demonstrate the absence or presence of free liquids in the stored/treated waste, the following test must be used: EPA Method 9095 (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 R.61-79.260.11. (amended 11/90)

(b) Tank systems including sumps as defined in R.61-79.260.10, that serve as part of a secondary containment system to collect or contain releases of hazardous wastes are exempted from the requirements in Section 265.193(a).

(c) Tanks, sumps, and other collection devices used in conjunction with drip pads, as defined in 260.10 of this chapter and regulated under part 265 subpart W, must meet the requirements of this subpart.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.191. Assessment of existing tank system's integrity.

(a) For each existing tank system that does not have secondary containment meeting the requirements of 265.193, 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 a qualified Professional Engineer in accordance with 270.11(d), that attests to the tank system's integrity by January 12, 1988.

(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 or 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, this assessment must consist of a leak test that is capable of taking into account the effects of temperature variations, tank and deflection, vapor pockets, and high water table effects.

[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 the integrity examination of an other than non-enterable underground tank system.]

(ii) For other than non-enterable underground tanks and for ancillary equipment, this assessment must be either a leak test, as described above, or an internal inspection and/or other tank integrity examination certified by a qualified Professional Engineer in accordance with 270.11(d) that addresses cracks, leaks, corrosion, and erosion.

(c) Tank systems that store or treat materials that become hazardous wastes subsequent to July 14, 1986 must conduct this assessment within 12 months after the date that the waste becomes a hazardous waste.

(d) If, as a result of the assessment conducted in accordance with paragraph (a) of this section, a tank system is found to be leaking or unfit for use, the owner or operator must comply with the requirements of Section 265.196.

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.192. Design and installation of new tank systems or components.

(a) Owners or operators of new tank systems or components must ensure 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 so that it will not collapse, rupture, or fail. The owner or operator must obtain a written assessment reviewed and certified by a qualified Professional Engineer in accordance with 270.11(d) attesting that the system has sufficient structural integrity and is acceptable for the storing and treating of hazardous waste. This assessment must include the following information:

- (1) Design standard(s) according to which the tank(s) and ancillary equipment is or will be 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 is or 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) Stray electric current; and
- (H) Existing corrosion-protection measures (e.g. coating, cathodic protection), and

(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.
- (B) Corrosion-resistant coating (such as epoxy, fiberglass) with cathodic protection (e.g. impressed current or sacrificial anodes); and
- (C) Electrical isolation devices such as insulating joints and flanges.

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 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 dislodgment where the tank system is placed in a saturated zone, or is located within a seismic fault zone; 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 a qualified Professional Engineer, either of whom is trained and experienced in the proper installation of tank systems, must inspect the system or component 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 or installation.

All discrepancies must be remedied before the tank system is covered, enclosed, or placed in use.

(c) New tank systems or components and piping that are placed underground and that are backfilled must be provided with a backfill material that is a noncorrosive, porous, homogenous substance and that is carefully installed so that the backfill is placed completely around the tank and compacted to ensure that the tanks 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 lead(s) in the system must be performed prior to the tank system being covered, enclosed, or placed in 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 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 necessary, based on the information provided under paragraph (a)(3) of this section, 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 to 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 R.61-79.270.11(d).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.193. 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 2 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 due to pressure gradients (including static head and external hydrological forces), physical contact with the waste to which they are exposed, climatic conditions, the stress of installation, and the stress of daily operation (including stresses from nearby vehicular traffic);

(2) Placed on a foundation or a base capable of providing support to the secondary containment system and 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 and secondary containment structure or any release of hazardous waste or accumulated liquid in the secondary containment system within 24 hours, or at the earliest practicable time if the existing detection technology or site conditions will not allow detection of a release within 24 hours;

(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 or the environment, if removal of the released waste or accumulated precipitation cannot be accomplished within 24 hours.

Note: If the collected material is a hazardous waste under part 261 of this chapter, it is subject to management as a hazardous waste in accordance with all applicable requirements of parts 262 through 266 of this chapter. 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 Publicly Owned Treatment Works (POTWs), 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;
- (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 completely surround the tanks and to cover all surrounding earth likely to come into contact with the waste if 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 a chemical-resistant water stops in place at 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 or
 - (B) Meets the definition of reactive waste under R.61-79.261.23 and may form an ignitable or explosive vapor; and
- (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 within an outer shell) so that any release from the inner tank is contained by the outer shell;
- (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 concurs, that the existing leak detection technology or site conditions will not allow detection of a release within 24 hours.

Note: The provisions outlined in the Steel Tank Institute's (STI) Standard for Dual Wall Underground Steel Storage Tank may be used as guidelines for aspects of the design of underground steel doublewalled tanks.

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

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

(4) Pressurized above ground 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, either: that alternative design and operating practices, together with location characteristics, will prevent the migration of hazardous waste or hazardous constituents into the groundwater 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 groundwater 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. Application for a variance as allowed in paragraph (g) of this section does not waive compliance with the requirements of this Subpart for new tank systems.

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

(i) The nature and quantity of the waste;

(ii) The proposed alternate design and operation;

(iii) The hydrogeologic setting of the facility, including the thickness of soils between the tank system and groundwater; and

(iv) All other factors that would influence the quality and mobility of the hazardous constituents and the potential for them to migrate to groundwater 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 groundwater, 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, and

(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 groundwater quality, taking into account:

(A) The quantity and quality of groundwater and the direction of groundwater flow.

(B) The proximity and withdrawal rates of water in the area,

(C) The current and future uses of groundwater in the area, and

(D) The existing quality of groundwater, including other sources of contamination and their cumulative impact on the groundwater quality;

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

(A) The quantity and quality of groundwater and the direction of groundwater 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 Section 265.196 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 and response to 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 groundwater or surface water; and

(iii) If contaminated soil cannot be removed or decontaminated in accordance with paragraph (g)(3)(ii) of this section, comply with the requirements of R.61-79.265.197(b);

(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 paragraph (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 Section 265.196(a),(b),(c), and (d); and

(ii) Prevent the migration of hazardous waste or hazardous constituents to groundwater or surface water, if possible, and decontaminate or remove contaminated soil. If contaminated soil cannot be decontaminated or removed, or if groundwater has been contaminated, the owner or operator must comply with the requirements of Section 265.197(b);

(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 Section 265.192 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 groundwater 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 intends to conduct and submit a demonstration for a variance from secondary containment as allowed in paragraph (g) of this section 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; and

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

(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 paragraph (g)(1) or paragraph (g)(2) of this section.

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

(4) The Department will inform the public, through a newspaper notice, of the availability of the demonstration for a variance. The notice shall be placed in a daily or weekly major local newspaper of general circulation and shall provide at least 30 days from the date of the notice for the public to review and comment on the demonstration for a variance. The Department also will hold a public hearing, in response to a request or at its own discretion, whenever such a hearing might clarify one or more issues concerning the demonstration for a variance. Public notice of the hearing will be given at least 30 days prior to the date of the hearing and may be given at the same time as notice of the opportunity for the public to review and comment on the demonstration. These two notices may be combined.

(5) The Department will approve or disapprove the request for a variance within 90 days of receipt of the demonstration from the owner or operator and will notify in writing the owner or operator and each person who submitted written comments or requested notice of the variance decision. If the demonstration for a variance is incomplete or does not include sufficient information, the 90-day time period will begin when the Department receives a complete demonstration, including all information necessary to make a final determination. If the public comment period in paragraph (h)(4) of this section is extended, the 90-day time period will be similarly extended.

(i) All tank systems, until such time as secondary containment meeting 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 Section 265.191(b)(5) must be conducted at least annually;

(2) For other than non-enterable underground tanks, and for all ancillary equipment, the owner or operator must either conduct a leak test as in paragraph (i)(1) of this section or an internal inspection or other tank integrity examination by a qualified Professional Engineer that addresses cracks, leaks, and corrosion or erosion at least annually. 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.

Note: The practices described in the American Petroleum Institute (API) Publication Guide for Inspection of Refining Equipment, Chapter XIII, Atmospheric and Low Pressure Storage Tanks, 4th edition, 1981, may be used, when applicable, as guidelines for assessing the over-all condition of the tank system.

(3) 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.

(4) 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 Section 265.196.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

265.194. 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 secondary containment system to rupture, leak, corrode, or otherwise fail.

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

(1) Spill prevention controls (e.g., check valves, dry discount 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 Section 265.196 if a leak or spill occurs in the tank system.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.195. Inspections.

(a) The owner or operator must inspect, where present, 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.

Note: Section 265.15(c) requires the owner or operator to remedy any deterioration or malfunction he finds. Section 265.196 requires the owner or operator to notify the Department within 24 hours of confirming a release. Also, 40 CFR part 302 may require the owner or operator to notify the National Response Center of a release.

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

(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) Above ground portions of the tank system, if any, to detect corrosion or releases of waste; and

(3) 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)

(c) Owners or operators of tank systems that either use leak detection equipment 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 (b)(1) through (3) 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.

(d) [Reserved]

(e) Ancillary equipment that is not provided with secondary containment, as described in 265.193(f)(1) through (4), must be inspected at least once each operating day.

(f) 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, 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 maintaining and inspecting cathodic protection systems.

(g) The owner or operator must document in the operating record of the facility an inspection of those items in paragraphs (a) and (b) of this section.

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25,

1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

265.196. 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 waste. 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 or operator must, within 24 hours after detection of the leak or, if the owner or operator demonstrates that that 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 release 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 or 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 detection.

(2) A leak or spill of hazardous waste that is:

(i) Less than or equal to a quantity of one (1) pound, and

(ii) Immediately contained and cleaned-up is exempted from the requirements of this paragraph.

(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 down gradient drinking water, surface water, and population areas; and

(v) Description of response actions taken or planned.

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

(1) Unless the owner or operator satisfies the requirements of paragraphs (e)(2) through (4) of this section, the tank system must be closed in accordance with Section 265.197.

(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.

(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 Section

265.193 before it can be returned to service, unless the source of the leak is an above ground portion of a tank system. 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 Section 265.192 and 265.193. 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 in-ground or on-ground tank), the entire component must be provided with secondary containment in accordance with Section 265.193 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 a qualified Professional Engineer in accordance with 270.11(d) that the repaired system is capable of handling hazardous wastes without release for the intended life of the system. This certification is to be placed in the operating record and maintained until closure of the facility.

Note: 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 § 44-56-30, -50, -140, -200 or § 48-1-50 et seq. or RCRA section 3004(v), 3008(h), or 7003(a) requiring corrective action or such other response as deemed necessary to protect human health or the environment. (revised 12/92)

Note: See 265.15(c) for the requirements necessary to remedy a failure. Also, 40 CFR part 302 and SC § 44-56-200 requires the owner or operator to notify the Department and the National Response Center of a release of any reportable quantity. (revised 12/92)

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.197. 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 R.61-79.261.3(d) applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for tank systems must meet all of the requirements specified in Subparts G and H of this Regulation.

(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 Section 265.310. 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 of the requirements for landfills specified in Subparts G and H of this Regulation.

(c) If an owner or operator has a tank system which does not have secondary containment that meets the requirements of sections 265.193(b) through (f) and which is not exempt from the secondary containment requirements in accordance with section 265.193(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 these 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 Subparts G and H of this Regulation.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.198. Special requirements for ignitable or reactive wastes.

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

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

(i) The resulting waste, mixture, or dissolved material no longer meets the definition of ignitable or reactive waste under R.61-79.261.21 or 261.23 of this chapter; and

(ii) Section 265.17(b) is complied with; or

(2) The waste is stored or treated in such a way that it is protected from any material or conditions which 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 tanks 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 R.61-79.260.11).

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.199. Special requirements for incompatible wastes.

(a) Incompatible wastes, or incompatible waste and materials, must not be placed in the same tank system unless Section 265.17(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 Section 265.17(b) is complied with.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.200. Waste analysis and trial tests.

In addition to performing the waste analysis required by Section 265.13, the owner or operator must, whenever a tank system is to be used to treat chemically or to store a hazardous waste that is substantially different from waste previously treated or stored in that tank system: or treat chemically a hazardous waste with a substantially different process than any previously used in that tank system:

(a) Conduct waste analyses and trial treatment or storage tests (e.g., bench-scale or pilot-plant scale tests); or

(b) Obtain written, documented information on similar waste under similar operating conditions to show that the proposed treatment or storage will meet the requirements of section 265.194(a).

Note: Section 265.13 requires the waste analysis plan to include analyses needed to comply with 265.198 and 265.199. Section 265.73 requires the owner or operator to place the results from each waste analysis and trial test, or the documented information, in the operating record of the facility.

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.201. Reserved.

HISTORY: Former Regulation, titled Special requirements for generators of between 100 and 1,000 kg/mo that accumulate hazardous waste in tanks, had the following history: Added by State Register Volume 14, Issue No.

11, eff November 23, 1990; Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993, State Register Volume 32, Issue no. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012. Reserved by SCSR 43-5 Doc. No. 4841, eff May 24, 2019.

265.202. 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.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

SUBPART K Surface Impoundments

265.220. 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 Section 265.1 provides otherwise.

265.221. Design and operating requirements.

(a) The owner or operator of each new surface impoundment unit, each lateral expansion of a surface impoundment unit, and each replacement of an existing surface impoundment unit must install two or more liners, and a leachate collection and removal system between the liners, and operate the leachate collection and removal system, in accordance with 264.221(c), unless exempted under 264.221(d), (e), or (f).

(b) The owner or operator of each unit referred to in paragraph (a) of this section must notify the Department at least sixty days prior to receiving waste. The owner or operator of each facility submitting notice must file a Part B application within six months of the receipt of such notice.

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

- (1) The existing unit was constructed in compliance with the design standards of 3004(o)(1)(A)(i) and (o)(5) of the Resource Conservation and Recovery Act; and
- (2) There is no reason to believe that the liner is not functioning as designed.

(d) The double liner requirements set forth in paragraph (a) 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 Characteristics in R.61-79.261.24 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 such 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 a liner designed, constructed, installed, and operated to prevent hazardous waste from migrating beyond the liner to adjacent subsurface soil, groundwater, 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 (a) 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 must comply with appropriate postclosure requirements, including but not limited to groundwater monitoring and corrective action;

- (B) The monofill is located more than one-quarter mile from an "underground source of drinking water" (as that term is defined in Department regulation R.61-68); and

(C) The monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with permits under R.61-79.270 and § 44-56-60 or RCRA section 3005(c); or (revised 12/92)

(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 groundwater or surface water at any future time.

(e) In the case of any unit in which the liner and leachate collection system has been installed pursuant to the requirements of paragraph (a) of this section and in good faith compliance with paragraph (a) of this section and with guidance documents governing liners and leachate collection systems under paragraph (a) of this section, no liner or leachate collection system which is different from that which was so installed pursuant to paragraph (a) of this section will be required for such unit by the Department when issuing the first permit under these regulations to such facility, except that the Department will not be precluded from requiring installation of a new liner when the Department has reason to believe that any liner installed pursuant to the requirements of paragraph (a) of this section is leaking.

(f) A surface impoundment must maintain enough freeboard to prevent any overtopping of the dike by overfilling, wave action, or a storm. Except as provided in paragraph (b) of this section, there must be at least 60 centimeters (two feet) of freeboard.

(g) A freeboard level less than 60 centimeters (two feet) may be maintained if the owner or operator obtains certification by a qualified engineer that alternate design features or operating plans will, to the best of his knowledge and opinion, prevent overtopping of the dike. The certification, along with a written identification of alternate design features or operating plans preventing overtopping, must be maintained at the facility.

(h) Surface impoundments that are newly subject to RCRA section 3005(j)(1) due to the promulgation of additional listings or characteristics for the identification of hazardous waste must be in compliance with paragraphs (a), (c) and (d) of this section not later than 48 months after the promulgation of the additional listing or characteristic. This compliance period shall not be cut short as the result of the promulgation of land disposal prohibitions under part 268 of this chapter or the granting of an extension to the effective date of a prohibition pursuant to 268.5 of this chapter, within this 48-month period.

HISTORY: Added by State Register Volume 10, Issue No. 1, eff January 24, 1986. Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.222. Action leakage rate.

(a) The owner or operator of surface impoundment units subject to 265.221(a) must submit a proposed action leakage rate to the Department when submitting the notice required under 265.221(b). Within 60 days of receipt of the notification, the Department will: Establish an action leakage rate, either as proposed by the owner or operator or modified using the criteria in this section; or extend the review period for up to 30 days. If no action is taken by the Department before the original 60 or extended 90 day review periods, the action leakage rate will be approved as proposed by the owner or operator.

(b) The Department shall approve an action leakage rate for surface impoundment units subject to 265.221(a). 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.).

(c) 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 265.226(b), 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 closes in accordance with 265.228(a)(2), monthly during the post-closure care period when monthly monitoring is required under 265.226(b).

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.223. Containment system.

All earthen dikes must have a protective cover, such as grass, shale, or rock, to minimize wind and water erosion and to preserve their structural integrity.

265.224. Response actions.

(a) The owner or operator of surface impoundment units subject to 265.221(a) must develop and keep on site until closure of the facility a response action plan. 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 exceedance 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.225. Waste analysis and trial tests.

(a) In addition to the waste analyses required by Subpart B Section 265.13, whenever a surface impoundment is to be used to:

(1) Chemically treat a hazardous waste which is substantially different from waste previously treated in that impoundment; or

(2) Chemically treat hazardous waste with a substantially different process than any previously used in that impoundment; the owner or operator must, before treating the different waste or using the different process:

(i) Conduct waste analyses and trial treatment tests (e.g., bench scale or pilot plant scale tests);
or

(ii) Obtain written, documented information on similar treatment of similar waste under similar operating conditions; to show that this treatment will comply with paragraph 265.17(b).

[Comment: As required by 265.13, the waste analysis plan must include analyses needed to comply with 265.229 and 265.230. As required by 265.73, the owner or operator must place the results from each waste analysis and trial test, or the documented information, in the operating record of the facility.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.226. Monitoring and inspection.

(a) The owner or operator must inspect:

(1) The freeboard level at least once each operating day to ensure compliance with Section 265.222; and

(2) The surface impoundment, including dikes and vegetation surrounding the dike, at least once a week to detect any leaks, deterioration, or failures in the impoundment.

[Comment: As required by 265.15(c), the owner or operator must remedy any deterioration or malfunction he finds.]

(b)(1) An owner or operator required to have a leak detection system under 265.221(a) 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 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. The timing for submission and approval of the proposed "pump operating level" will be in accordance with 265.222(a).

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.228. Closure and postclosure care.

(a) At closure, the owner or operator must: (amended 11/90)

(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 wastes unless Section 261.3(d) of this regulation applies; or

(2) Close the impoundment and provide postclosure care for a landfill under subpart G and section 265.310, including the following:

(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 the 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 cover;
- (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) In addition to the requirements of Subpart G, and Section 265.310, during the post-closure care period, the owner or operator of a surface impoundment in which wastes, waste residues, or contaminated materials remain after closure in accordance with the provisions of paragraph (a)(2) of this selection must:

- (1) Maintain the integrity and effectiveness of the final cover, including making repairs to the cover 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) of this chapter and 265.226(b) and comply with all other applicable leak detection system requirements of this part; (added 12/93; 5/96)
- (3) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of subpart F of this part; and
- (4) Prevent runoff and runoff from eroding or otherwise damaging the final cover.

HISTORY: Amended by State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996.

265.229. Special requirements for ignitable or reactive wastes.

Ignitable or reactive waste must not be placed in a surface impoundment, unless the waste and impoundment satisfy all applicable requirements of 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 Sections 261.21 or 261.23; and
 - (2) Subpart B Section 265.17(b) is complied with; or
- (b)(1) 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; and
 - (2) The owner or operator obtains a certification from a qualified chemist or engineer that to the best of his knowledge and opinion, the design features or operating plans of the facility will prevent ignition or reaction; and
 - (3) The certification and the basis for it are maintained at the facility; or
- (c) The surface impoundment is used solely for emergencies.

HISTORY: Amended by State Register Volume 9, Issue No. 1, eff January 24, 1985; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.230. Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials, (see Appendix V for examples) must not be placed in the same surface impoundment, unless Subpart B paragraph 265.17(b) is complied with.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.231. 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.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

SUBPART L
Waste Piles

265.250. Applicability.

The regulations in this subpart apply to owners and operators of facilities that treat or store hazardous waste in piles, except as section 265.1 provides otherwise. Alternatively, a pile of hazardous waste may be managed as a landfill under subpart N.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.251. Protection from wind.

The owner or operator of a pile containing hazardous waste which could be subject to dispersal by wind must cover or otherwise manage the pile so that wind dispersal is controlled.

265.252. Waste analysis.

In addition to the waste analyses required by section 265.13, the owner or operator must analyze a representative sample of waste from each incoming movement before adding the waste to any existing pile, unless

- (1) The only wastes the facility receives which are amenable to piling are compatible with each other, or
- (2) the waste received is compatible with the waste in the pile to which it is to be added.

The analysis conducted must be capable of differentiating between the types of hazardous waste the owner or operator places in piles, so that mixing of incompatible waste does not inadvertently occur. The analysis must include a visual comparison of color and texture.

[Comment: As required by 265.13, the waste analysis plan must include analyses needed to comply with 265.256 and 265.257. As required by 265.73, the owner or operator must place the results of this analysis in the operating record of the facility.] (revised 12/92)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.253. Containment.

- (a) If leachate or runoff from a pile is a hazardous waste, then either:
 - (1) The pile must be placed on an impermeable base that is compatible with the waste under the conditions of treatment or storage;
 - (2) 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 25-year storm;
 - (3) 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; and
 - (4) 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 to maintain design capacity of the system; or
- (b)(1) The pile must be protected from precipitation and run-on by some other means; and
 - (2) No liquids or wastes containing free liquids may be placed in the pile.

[Comment: If collected leachate or runoff is discharged through a point source to waters of the United States, it is subject to the requirements of section 402 of the Clean Water Act, as amended.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.254. Design and operating requirements.

The owner or operator of each new waste pile on which construction commences after January 29, 1992, each lateral expansion of a waste pile unit on which construction commences after July 29, 1992, and each such replacement of an existing waste pile 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, and operate the leachate collection and removal systems, in accordance with 264.251(c), unless exempted under 264.251(d), (e), or (f), of this chapter; and must comply with the procedures of 265.221(b). "Construction commences" is as defined in 260.10 of this chapter under "existing facility".

HISTORY: Added by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.255. Action leakage rates.

(a) The owner or operator of waste pile units subject to 265.254 must submit a proposed action leakage rate to the Department when submitting the notice required under 265.254. Within 60 days of receipt of the notification, the Department will: Establish an action leakage rate, either as proposed by the owner or operator or modified using the criteria in this section; or extend the review period for up to 30 days. If no action is taken by the Department before the original 60 or extended 90 day review periods, the action leakage rate will be approved as proposed by the owner or operator.

(b) The Department shall approve an action leakage rate for waste pile units subject to section 265.254. 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 one (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.).

(c) 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 265.260, 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by SCSR 44-6 Doc. No. 4883, eff June 26, 2020.

265.256. Special requirements for ignitable or reactive waste.

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

(1) Addition of the waste to an existing pile;

(i) results in the waste or mixture no longer meeting the definition of ignitable or reactive waste under Sections 261.21 or 261.23, and

(ii) complies with Subpart B Section 265.17(b); or

(2) 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.

(b) [Blank]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.257. 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 Subpart B Section 265.17(b) is complied with.

(b) A pile of hazardous waste that is incompatible with any waste or other material 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. (amended 11/90)

[Comment: The purpose of this is to prevent fires, explosions, gaseous emissions, leaching, or other discharge of hazardous waste or hazardous waste constituents which could result from the contact or mixing of incompatible wastes or materials.]

(c) Hazardous waste must not be piled on the same area where incompatible wastes or materials were previously piled, unless the area has been decontaminated sufficiently to ensure compliance with Subpart B Section 265.17(b).

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.258. Closure and postclosure 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 R.61-79.261.3(d) applies; or

(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 must close the facility and perform postclosure care in accordance with the closure and postclosure requirements that apply to landfills. (revised 12/92)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.259. Response actions.

(a) The owner or operator of waste pile units subject to 265.254 must develop and keep on-site until closure of the facility a response action plan. 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 determination system exceeds the action leakage rate for any sump, the owner or operator must:

(1) Notify the Department in writing of the exceedance 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 receipts 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.260. Monitoring and inspection.

An owner or operator required to have a leak detection system under 265.254 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART M *Land Treatment*

265.270. Applicability.

The regulations in this subpart apply to owners and operators of hazardous waste land treatment facilities, except as section 265.1 provides otherwise. (revised 12/92)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.272. General operating requirements.

(a) Hazardous waste must not be placed in or on a land treatment facility unless the waste can be made less hazardous or non-hazardous by degradation, transformation, or immobilization processes occurring in or on the soil.

(b) The owner or operator must design, construct, operate, and maintain a run-on control system capable of preventing flow onto the active portions of the facility during peak discharge from at least a 25-year storm.

(c) The owner or operator must design, construct, operate, and maintain a run-off management system capable of collecting and controlling a water volume at least equivalent to a 24-hour 25-year storm.

(d) 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.

(e) 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.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.273. Waste analysis.

In addition to the waste analyses required by section 265.13, before placing a hazardous waste in or on a land treatment facility, the owner or operator must:

(a) Determine the concentrations in the waste of any substances which equal or exceed the maximum concentrations contained in Table I of R.61-79.261.24 that cause a waste to exhibit the Toxicity Characteristic;

(b) For any waste listed in R.61-79.261 Subpart D, determine the concentrations of any substances which cause the waste to be listed as a hazardous waste; and

(c) If food chain crops are grown, determine the concentrations in the waste of each of the following constituents: arsenic, cadmium, lead, and mercury, unless the owner or operator has written, documented data that show that the constituent is not present.

[Comment: part 261 of this chapter specifies the substances for which a waste is listed as a hazardous waste. As required by 265.13, the waste analysis plan must include analyses needed to comply with 265.281 and 265.282. As required by 265.73, the owner or operator must place the

results from each waste analysis, or the documented information, in the operating record of the facility.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.276. Food chain crops.

(a) An owner or operator of a hazardous waste land treatment facility on which food chain crops are being grown, or have been grown and will be grown in the future, must notify the Department.

[Comment: The growth of food chain crops at a facility which has never before been used for this purpose is a significant change in process under 270.72(a)(3).]

(b)(1) Food chain crops must not be grown on the treated area of a hazardous waste land treatment facility unless the owner or operator can demonstrate, based on field testing, that any arsenic, lead, mercury, or other constituents identified under paragraph 265.273(b):

- (i) Will not be transferred to the food portion 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 the crops grown on the land treatment facility than in the same crops grown on untreated soils under similar conditions in the same region.

(2) The information necessary to make the demonstration required by paragraph (b)(1) of this section must be kept at the facility and must, at a minimum:

- (i) Be based on tests for the specific waste and application rates being used at the facility; and
- (ii) Include descriptions of crop and soil characteristics, sample selection criteria sample size determination, analytical methods, and statistical procedures.

(c) Food chain crops must not be grown on a land treatment facility receiving wastes that contains cadmium unless all requirements of paragraph (c)(1)(i) through (c)(1)(iii) below or all requirements of paragraph (c)(2)(i) through (c)(2)(iv) below are met.

(1)(i) The pH of the waste and soil mixture is 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 does 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 foodchain crops, the annual cadmium application rate does not exceed:

Time Period	Annual Cd application rate (kilograms per hectare)
Present to June 30, 1984	2.0
July 1, 1984 to Dec. 31, 1986	1.25
Beginning Jan. 1, 1987	0.5

(iii) The cumulative application of cadmium from waste does not exceed the levels in either (c)(1)(iii)(A) or (c)(1)(iii)(B) below.

(A)

Soil cation exchange capacity (meg/100g)	Maximum cumulative application (kg/ha)	
	Background soil pH less than 6.5	Background soil pH greater than 6.5
Less than 5	5	5
5-15	5	10
Greater than 15	5	20

(B) For soils with a background pH of less than 6.5, the cumulative cadmium application rate does not exceed the levels below: Provided, that the pH of the waste and soil mixture is adjusted to and maintained at 6.5 or greater whenever food chain crops are grown.

Soil cation exchange capacity (meg/100g)	Maximum cumulative application (kg/ha)
Less than 5	5
5-15	10
Greater than 15	20

(2)(i) The only food chain crop produced is animal feed.

(ii) The pH of the waste and soil mixture is 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 is maintained whenever food chain crops are grown. (revised 12/92)

(iii) There is a facility operating plan which demonstrates how the animal feed will be distributed to preclude ingestion by humans. The facility operating plan describes the measures to be taken to safeguard against possible health hazards from cadmium entering the food chain, which may result from alternative land uses.

(iv) Future property owners are notified by a stipulation in the land record or property deed which states that the property has received waste at high cadmium application rates and that food chain crops must not be grown except in compliance with paragraph (c)(2) of this section.

[Comment: As required by 265.73, if an owner or operator grows food chain crops on his land treatment facility, he must place the information developed in this section in the operating record of the facility.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 28, Issue No. 6, eff June 25, 2004.

265.278. Unsaturated zone (zone of aeration) monitoring.

(a) The owner or operator must have in writing, and must implement, an unsaturated zone monitoring plan which is designed to:

(1) Detect the vertical migration of hazardous waste and hazardous waste constituents under the active portion of the land treatment facility, and

(2) Provide information on the background concentrations of the hazardous waste and hazardous waste constituents in similar but untreated soils nearby; this background monitoring must be conducted before or in conjunction with the monitoring required under (a)(1) of this Section.

(b) The unsaturated zone monitoring plan must include, at a minimum:

(1) Soil monitoring using soil cores, and

(2) Soil-pore water monitoring using devices such as lysimeters.

(c) To comply with paragraph (a)(i) of this Section, the owner or operator must demonstrate in his unsaturated zone monitoring plan that:

(1) The depth at which soil and soil-pore water samples are to be taken is below the depth to which the waste is incorporated into the soil;

(2) The number of soil and soil-pore water samples to be taken is based on the variability of:

(i) The hazardous waste constituents (as identified in paragraphs 265.273(a) and (b)) in the waste and in the soil; and

(ii) The soil type(s); and

(3) The frequency and timing of soil and soil-pore water sampling is based on the frequency, time, and rate of waste application, proximity to groundwater, and soil permeability.

(d) The owner or operator must keep at the facility his unsaturated zone monitoring plan, and the rationale used in developing this plan.

(e) The owner or operator must analyze the soil and soil pore water samples for the hazardous waste constituents that were found in the waste during the waste analysis under paragraphs 265.273(a) and (b).

[Comment: As required by 265.73, all data and information developed by the owner or operator under this section must be placed in the operating record of the facility.]

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.279. Recordkeeping.

The owner or operator must include hazardous waste application dates and rates in the operating record required under section 265.73. (revised 12/92)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.280. Closure and postclosure.

(a) In the closure plan under section 265.112, and the postclosure plan under section 265.118, the owner or operator must address the following objectives and indicate how they will be achieved:

- (1) Control of the migration of hazardous waste and hazardous waste constituents from the treated area into the groundwater;
- (2) Control of the release of contaminated run-off from the facility into surface water;
- (3) Control of the release of airborne particulate contaminants caused by wind erosion; and
- (4) Compliance with Section 265.276 concerning the growth of food-chain crops.

(b) The owner or operator must consider at least the following factors in addressing the closure and post-closure care objectives of paragraph (a) of this Section:

- (1) Type and amount of hazardous waste and hazardous waste constituents applied to the land treatment facility;
- (2) The mobility and the expected rate of migration of the hazardous waste and hazardous waste constituents;
- (3) Site location, topography, and surrounding land use, with respect to the potential effects of pollutant migration (e.g., proximity to groundwater, surface water and drinking water sources);
- (4) Climate, including amount, frequency, and pH of precipitation;
- (5) Geological and soil profiles and surfaces and subsurface hydrology of the site, and soil characteristics, including cation exchange capacity, total organic carbon, and pH;
- (6) Unsaturated zone monitoring information obtained under Section 265.278; and
- (7) Type, concentration, and depth of migration of hazardous waste constituents in the soil as compared to their background concentrations.

(c) The owner or operator must consider at least the following methods in addressing the closure and post-closure care objectives of paragraph (a) of this Section:

- (1) Removal of contaminated soils;
- (2) Placement of final cover, considering:
 - (i) Functions of the cover (e.g., infiltration control, erosion and run-off control, and wind erosion control), and
 - (ii) Characteristics of the cover, including material, final surface contours, thickness, porosity and permeability, slope, length of run of slope, and type of vegetation on the cover; and
- (3) Monitoring of groundwater.

(d) In addition to the requirements of Subpart G of this Part, during the closure period, the owner or operator of a land treatment facility:

- (1) Continue unsaturated zone monitoring in a manner and frequency specified in the closure plan except that soil-pore liquid monitoring may be terminated 90 days after the last application of waste to the treatment zone;
- (2) Maintain the run-on control system required under Paragraph 265.272(b);
- (3) Maintain the run-off management system required under paragraph 265.272(c); and
- (4) Control wind dispersal of particulate matter which may be subject to wind dispersal.

(e) For the purpose of complying with 265.115, when closure is completed the owner or operator may submit to the Department certification both by the owner or operator and by an independent, qualified soil scientist, in lieu of a qualified Professional Engineer, that the facility has been closed in accordance with the specifications in the approved closure plan.

(f) In addition to the requirements of 265.117, during the postclosure care period the owner or operator of a land treatment unit must:

(1) Continue soil-core monitoring by collecting and analyzing samples in a manner and frequency specified in the post-closure plan:

(2) Restrict access to the unit as appropriate for its post-closure use;

(3) Assure that growth of food chain crops complies with 265.276; and (amended 11/90)

(4) Control wind dispersal of hazardous waste.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.281. 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 treatment zone meet all applicable requirements of 268, and: (revised 12/92)

(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 this chapter; and (revised 12/92)

(2) Section 265.17(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.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.282. Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials (see Appendix V for examples), must not be placed in the same land treatment area, unless section 265.17(b) is complied with. (amended 11/90, 12/92)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART N ***Landfills***

265.300. Applicability.

The regulations in this subpart apply to owners and operators of facilities that dispose of hazardous waste in landfills, except as section 265.1 provides otherwise. A waste pile used as a disposal facility is a landfill and is governed by this subpart.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.301. Design and operating requirements.

(a) The owner or operator of each new landfill unit, each lateral expansion of a landfill unit, and each replacement of an existing landfill unit must install two or more liners and a leachate collection and removal system above and between such liners, and operate the leachate collection and removal system, in accordance with 264.301(c), unless exempted under 264.301(d), (e), or (f) of this chapter.

(b) The owner or operator of each unit referred to in paragraph (a) of this section must notify the Department at least sixty days prior to receiving waste. The owner or operator of each facility submitting notice must file a Part B application within six months of the receipt of such notice.

(c) The owner or operator of any replacement landfill unit is exempt from paragraph (a) 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; and

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

(d) The double liner requirement set forth in paragraph (a) 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 R.61-79.261.24 of this chapter, 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 such 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 Department regulation R.61-68); and

(C) The monofill is in compliance with generally applicable groundwater monitoring requirements for facilities with permits under R. 61-79.270 and 44-56-60 or RCRA section 3005(c); 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 groundwater or surface water at any future time.

(e) In the case of any unit in which the liner and leachate collection system has been installed pursuant to the requirements of paragraph (a) of this section and in good faith compliance with paragraph (a) of this section and with guidance documents governing liners and leachate collection systems under paragraph (a) of this section, no liner or leachate collection system which is different from that which was so installed pursuant to paragraph (a) of this section will be required for such unit by the Department when issuing the first permit to such facility, except that the Department will not be precluded from requiring installation of a new liner when the Department has reason to believe that any liner installed pursuant to the requirements of paragraph (a) of this section is leaking. (revised 12/92)

(f) The owner or operator must design, construct, operate, and maintain a runoff control system capable of preventing flow onto the active portion of the landfill during peak discharge from at least a 25-year storm.

(g) The owner or operator must design, construct, operate and maintain a runoff management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

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

(i) The owner or operator of a landfill containing hazardous waste which is subject to dispersal by wind must cover or otherwise manage the landfill so that wind dispersal of the hazardous waste is controlled.

(j) The owner or operator of a landfill which is not exempt from the requirements of R.61-79.265 Subpart F pursuant to R.61-79.265.90(c) shall maintain at least ten feet of naturally occurring material with an average permeability of no more than 1 E-06 centimeter per second directly beneath and in contact with the bottom of the constructed liner system as required under R.61-79.265.301(a).

[Comment: As required by 265.13, the waste analysis plan must include analyses needed to comply with 265.312, 265.313, and 265.314. As required by 265.73, the owner or operator must place the results of these analyses in the operating record of the facility.] (revised 12/92; moved 12/93; moved 5/96)

HISTORY: Adopted by State Register Volume 10, Issue No. 1, eff January 24, 1986. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.302. Action leakage rate.

(a) The owner or operator of landfill units subject to 265.301(a) must submit a proposed action leakage rate to the Department when submitting the notice required under 265.301(b). Within 60 days of receipt of the notification, the Department will: Establish an action leakage rate, either as proposed by the owner or operator or modified using the criteria in this section; or extend the review period for up to 30 days. If no action is taken by the Department before the original 60 or extended 90 day review periods, the action leakage rate will be approved as proposed by the owner or operator.

(b) The Department shall approve an action leakage rate for landfill units subject to 265.301(a). 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.).

(c) 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 265.304 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 265.304(b).

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996.

265.303. Response actions.

(a) The owner or operator of landfill units subject to 265.301(a) must develop and keep on site until closure of the facility a response action plan. 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 exceedance 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.304. Monitoring and inspection.

(a) An owner or operator required to have a leak detection system under 265.301(a) 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.

(b) 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.

(c) "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. The timing for submission and approval of the proposed "pump operating level" will be in accordance with 265.302(a).

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.309. Surveying and recordkeeping.

The owner or operator of a landfill must maintain the following items in the operating record required in section 265.73:

- (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.
- (c) The date and volume of leachate which was withdrawn from the cell.

HISTORY: Amended by State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.310. Closure and postclosure 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.

(b) After final closure, the owner or operator must comply with all postclosure requirements contained in sections 265.117 through section 265.120 including maintenance and monitoring throughout the postclosure care period. The owner or operator must: (amended 11/90)

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

(2) Maintain and monitor the leak detection system in accordance with 264.301(c)(3)(iv) and (4) of this chapter and 265.304(b), and comply with all other applicable leak detection system requirements of this part;

(3) Maintain and monitor the groundwater monitoring system and comply with all other applicable requirements of subpart F of this part;

(4) Prevent runoff and runoff from eroding or otherwise damaging the final cover; and

(5) Protect and maintain surveyed benchmarks used in complying with section 265.309.

(c) [Reserved 12/92]

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No.10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.312. Special requirements for ignitable or reactive waste.

(a) Except as provided in paragraph (b) of this section, and in section 265.316, ignitable or reactive waste must not be placed in a landfill, unless the waste and landfill meets all applicable requirements of 268, and:

(1) The resulting waste, mixture, or dissolution of material no longer meets the definition of ignitable or reactive waste under R.61-79.261.21 or 261.23; and

(2) Section 265.17(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 nonleaking 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 noncombustible 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.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.313. Special requirements for incompatible wastes.

Incompatible wastes, or incompatible wastes and materials, (see Appendix V for examples) must not be placed in the same landfill cell, unless 265.17(b) is complied with.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.314. Special requirements for bulk and containerized liquids.

(a) The placement of bulk or noncontainerized liquid hazardous waste or hazardous waste containing free liquids (whether or not sorbents have been added) in any landfill is prohibited.

(b) 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) had 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 Section 265.316 and is disposed of in accordance with Section 265.316.

(c) To demonstrate the absence or presence of free liquids in either a containerized or a bulk waste, the following test must be used: Method 9095 (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 R.61-79.260.11.

(d) The date for compliance with paragraph (a) of this section is November 19, 1981. The date for compliance with paragraph (c) of this section is March 22, 1982. (revised 12/92)

(e) 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 the Department 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 (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; or

(iii) The sorbent material is determined to be non-biodegradable under OECD test 301B: [CO₂ Evolution (Modified Sturm Test)].

(f) The placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of such landfill demonstrates to the Department, that:

(1) The only reasonably available alternative to the placement in such landfill is placement in a landfill or unlined surface impoundment, whether or not permitted or operating under interim status, which contains, or may reasonably be anticipated to contain, hazardous waste; and

(2) Placement in such owner or operator’s landfill will not present a risk of contamination of any “underground source of drinking water” (as that term is defined in section 270.2).

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 44-6 Doc. No. 4883, eff June 26, 2020.

265.315. 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 or buried in the landfill; or

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

HISTORY: Amended by State Register Volume 19, Issue No. 6, eff June 23, 1995.

265.316. 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 waste held therein. 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 265.314(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 265.17(b).

(d) Incompatible wastes, as defined in R.61-79.260.10, must not be placed in the same outside container.

(e) Reactive waste, other than cyanide-or sulfide-bearing waste as defined in R.61-79.261.23(a)(5) 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 wastes may be packaged 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 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.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 36, Issue No. 9, eff September 28, 2012.

SUBPART O ***Incinerators***

265.340. Applicability.(6/03)

(a) The regulations of this Subpart apply to owners and operators of hazardous waste incinerators (as defined in 260.10 of this chapter), except as 265.1 provides otherwise.

(b) Integration of the MACT standards.

(1) Except as provided by paragraphs (b)(2) and (b)(3), the standards no longer apply when an owner or operator demonstrates compliance with the maximum achievable control technology (MACT) requirements of 40 CFR part 63, subpart EEE, by conducting a comprehensive performance test and submitting to the Department a Notification of Compliance under 40 CFR part 63.1207(j) and 63.1210(d) documenting compliance with the requirements of part 63, subpart EEE.

(2) The following requirements continue to apply:

- (i) the closure requirements of 266.102(e)(11) and 266.103(l);
- (ii) the standards for direct transfer of 266.111
- (iii) the standards for regulation of residues of 266.212; and
- (iv) the applicable requirements of Subparts A through H, BB and CC of parts 264 and 265.

(c) Owners and operators of incinerators burning hazardous waste are exempt from all of the requirements of this Subpart, except 265.351 (Closure), provided that the owner or operator has documented, in writing, that the waste would not reasonably be expected to contain any of the hazardous constituents listed in part 261, Appendix VIII, of this chapter, and such documentation is retained at the facility, if the waste to be burned is:

(1) Listed as a hazardous waste in R.61-79.261 Subpart D, solely because it is ignitable (Hazard Code I), Corrosive (Hazard Code C), or both; or,

(2) Listed as a hazardous waste in R.61-79.261 Subpart D, solely because it is reactive (Hazard Code R) for characteristics other than those listed in R.61-79.261.23 (a)(4) and (a)(5), and will not be burned when other hazardous wastes are present in the combustion zone; or,

(3) 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 R.61-79.261 Subpart C; or,

(4) A hazardous waste solely because it possesses the reactivity characteristics described by 261.23 (a) (1), (2), (3), (6), (7), or (8) of this chapter, and will not be burned when other hazardous wastes are present in the combustion zone.

HISTORY: Amended by State Register Volume 11, Issue No.11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 30, Issue No. 6, eff June 23, 2006; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.341. Waste analysis.

In addition to the waste analyses required by section 265.13, the owner or operator must sufficiently analyze any waste which he has not previously burned in his incinerator to enable him to establish steady state (normal) operating conditions (including waste and auxiliary fuel feed and air flow) and to determine the type of pollutants which might be emitted. At a minimum, the analysis must determine:

- (a) Heating value of the waste;
- (b) Halogen content and sulfur content in the waste; and
- (c) Concentrations in the waste of lead and mercury, unless the owner or operator has written, documented data that show that the element is not present.

[Comment: As required by 265.73, the owner or operator must place the results from each waste analysis, or the documented information, in the operating record of the facility.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.345. General operating requirements.

During startup and shutdown of an incinerator, the owner or operator must not feed hazardous waste unless the incinerator is at steady state (normal) conditions of operation, including steady state operating temperature and air flow.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.347. Monitoring and inspections.

The owner or operator must conduct, as a minimum, the following monitoring and inspections when incinerating hazardous waste:

(a) Existing instruments which relate to combustion and emission control must be monitored at least every 15 minutes. Appropriate corrections to maintain steady state combustion conditions must be made immediately either automatically or by the operator. Instruments which relate to combustion and emission control would normally include those measuring waste feed, auxiliary fuel feed, air flow, incinerator temperature, scrubber flow, scrubber pH, and relevant level controls.

(b) The complete incinerator and associated equipment (pumps, valves, conveyors, pipes, etc.) must be inspected at least daily for leaks, spills, and fugitive emissions, and all emergency shutdown controls and systems alarms must be checked to assure proper operation.

265.351. 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.

[Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with 261.3(d) of this chapter, that the residue removed from his incinerator is not a hazardous waste, the owner or operator becomes a generator of hazardous waste

and must manage it in accordance with all applicable requirements of parts 262 through 266 and 268 of this chapter.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.352. Interim status incinerators burning particular hazardous wastes.

(a) Owners or operators of incinerators subject to this regulation may burn EPA Hazardous Wastes F020, F021, F022, F023, F026, or F027 if they receive a certification from the Department that they can meet the performance standards of Subpart O of R.61-79.264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify an incinerator:

(1) The owner or operator will submit an application to the Department containing applicable information in R.61-79.270.19 and 270.62 demonstrating that the incinerator can meet the performance standards in Subpart O of R.61-79.264 when they burn these wastes.

(2) The Department will issue a tentative decision as to whether the incinerator can meet the performance standards in Subpart O of R.61-79.264. Notification of this tentative decision will be provided by newspaper advertisement and by radio broadcast in the jurisdiction where the incinerator is located. The Department will accept comment on the tentative decision for 60 days. The Department also may hold a public hearing upon request or at its discretion.

(3) After the close of the public comment period, the Department will issue a decision whether or not to certify the incinerator.

HISTORY: Added by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990.

SUBPART P Thermal Treatment

265.370. Other thermal treatment.

The regulations in this subpart apply to owners or operators of facilities that thermally treat hazardous waste in devices other than enclosed devices using controlled flame combustion, except as section 265.1 provides otherwise. Thermal treatment in enclosed devices using controlled flame combustion is subject to the requirements of subpart O if the unit is an incinerator, and subpart H of part 266, if the unit is a boiler or an industrial furnace as defined in 260.10. (12/92, 5/93)

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; State Register Volume 30, Issue No. 6, eff June 23, 2006.

265.373. General operating requirements.

Before adding hazardous waste, the owner or operator must bring his thermal treatment process to steady state (normal) conditions of operation—including steady state operating temperature—using auxiliary fuel or other means, unless the process is a non-continuous (batch) thermal treatment process which requires a complete thermal cycle to treat a discrete quantity of hazardous waste.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

265.375. Waste analysis.

In addition to the waste analyses required by subpart B section 265.13, the owner or operator must sufficiently analyze any waste which he has not previously treated in his thermal process to enable him to establish steady state (normal) or other appropriate (for a noncontinuous process) operating conditions (including waste and auxiliary fuel feed) and to determine the type of pollutants which might be emitted. At a minimum, the analysis must determine:

- (a) Heating value of the waste;
- (b) Halogen content and sulfur content in the waste; and
- (c) Concentrations in the waste of lead and mercury, unless the owner or operator has written, documented data that show that the element is not present.

[Comment: As required by 265.73, the owner or operator must place the results from each waste analysis, or the documented information, in the operating record of the facility.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.377. Monitoring and inspections.

(a) The owner or operator must conduct, as a minimum, the following monitoring and inspections when thermally treating hazardous waste:

(1) Existing instruments which relate to temperature and emission control (if an emission control device is present) must be monitored at least every 15 minutes. Appropriate corrections to maintain steady state or other appropriate thermal treatment conditions must be made immediately either automatically or by the operator. Instruments which relate to temperature and emission control would normally include those measuring waste feed, auxiliary fuel feed, treatment process temperature, and relevant process flow and level controls.

(2) The stack plume (emissions), where present, must be observed visually at least hourly for normal appearance (color and opacity). The operator must immediately make any indicated operating corrections necessary to return any visible emissions to their normal appearance.

(3) The complete thermal treatment process and associated equipment (pumps, valves, conveyors, pipes, etc.) must be inspected at least daily for leaks, spills, and fugitive emissions, and all emergency shutdown controls and system alarms must be checked to assure proper operation.

265.381. Closure.

At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash) from the thermal treatment process or equipment.

[Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with 261.3(c) or (d) of this chapter, that any solid waste removed from his thermal treatment process or equipment is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262, 263, 265 and 268.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.382. Open burning; waste explosives.

Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment. Detonation is an explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level). Owners or operators choosing to open burn or detonate waste explosives must do so in accordance with the following table and in a manner that does not threaten human health or the environment.

Pounds of waste explosives or propellants	Minimum distance from open burning or detonation to property of others
0 to 100	204 meters (670 feet)
101 to 1,000	380 meters (1,250 feet)
1,001 to 10,000	530 meters (1,730 feet)
10,001 to 30,000	690 meters (2,260 feet)

265.383. Interim Status Thermal Treatment Devices Burning Particular Hazardous Waste.

(a) Owners or operators of thermal treatment devices subject to this Subpart may burn EPA Hazardous Wastes F020, F021, F022, F023, F026, or F027 if they receive a certification from the Department that they can meet the performance standards of Subpart O of R.61-79.264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify a thermal treatment unit:

(1) The owner or operator will submit an application to the Department containing the applicable information in R.61-79.270.19 and Subpart D Section 270.62 demonstrating that the thermal

treatment unit can meet the performance standard in Subpart O of R.61-79.264 when they burn these wastes.

(2) The Department will issue a tentative decision as to whether the thermal treatment unit can meet the performance standards in Subpart O of R.61-79.264. Notification of this tentative decision will be provided by newspaper advertisement and by radio broadcast in the jurisdiction where the thermal treatment device is located. The Department will accept comment on the tentative decision for 60 days. The Department also may hold a public hearing upon request or at his discretion.

(3) After the close of the public comment period, the Department will issue a decision whether or not to certify the thermal treatment unit.

HISTORY: Adopted by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990.

SUBPART Q *Chemical Physical, and Biological Treatment*

265.400. Applicability.

The regulations in this subpart apply to owners and operators of facilities which treat hazardous wastes by chemical, physical, or biological methods in other than tanks, surface impoundments, and land treatment facilities, except as section 265.1 provides otherwise. Chemical, physical, and biological treatment of hazardous waste in tanks, surface impoundments, and land treatment facilities must be conducted in accordance with subparts J, K, and M, respectively.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.401. General operating requirements.

(a) Chemical, physical, or biological treatment of hazardous waste must comply with paragraph 265.17(b).

(b) Hazardous wastes or treatment reagents must not be placed in the treatment process or equipment if they could cause the treatment process or equipment to rupture, leak, corrode, or otherwise fail before the end of its intended life.

(c) Where hazardous waste is continuously fed into a treatment process or equipment, the process or equipment must be equipped with a means to stop this inflow (e.g., a waste feed cut-off system or bypass system to a standby containment device).

[Comment: These systems are intended to be used in the event of a malfunction in the treatment process or equipment.]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.402. Waste analysis and trial tests.

(a) In addition to the waste analysis required by section 265.13, whenever:

(1) A hazardous waste which is substantially different from waste previously treated in a treatment process or equipment at the facility is to be treated in that process or equipment, or

(2) A substantially different process than any previously used at the facility is to be used to chemically treat hazardous waste; the owner or operator must, before treating the different waste or using the different process or equipment:

(i) Conduct waste analyses and trial treatment tests (e.g., bench scale or pilot plant scale tests); or

(ii) Obtain written, documented information on similar treatment of similar waste under similar operating conditions; to show that this proposed treatment will meet all applicable requirements of paragraphs 265.401(a) and (b).

[Comment: As required by 265.13, the waste analysis plan must include analyses needed to comply with 265.405 and 265.406. As required by 265.73, the owner or operator must place the

results from each waste analysis and trial test, or the documented information, in the operating record of the facility.]

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.403. Inspections.

(a) The owner or operator of a treatment facility must inspect, where present:

(1) Discharge control and safety equipment (e.g., waste feed cut-off systems, by-pass systems, drainage systems, and pressure relief systems) at least once each operating day, to ensure that it is in good working order;

(2) Data gathered from monitoring equipment (e.g., pressure and temperature gauges), at least once each operating day, to ensure that the treatment process or equipment is being operated according to its design;

(3) The construction materials of the treatment process or equipment, at least weekly, to detect corrosion or leaking of fixtures or seams; and

(4) The construction materials of, and the area immediately surrounding, discharge confinement structures (e.g., dikes), at least weekly, to detect erosion or obvious signs of leakage (e.g., wet spots or dead vegetation).

[Comment: As required by 265.15(c), the owner or operator must remedy any deterioration or malfunction he finds.]

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.404. Closure.

At closure, all hazardous waste and hazardous waste residues must be removed from treatment processes or equipment, discharge control equipment, and discharge confinement structures.

[Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with 261.3 (c) or (d) of this chapter, that any solid waste removed from his treatment process or equipment is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262, 263, and 265 and 268.] (revised 12/92)

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.405. Special requirements for ignitable or reactive wastes.

(a) Ignitable or reactive waste must not be placed in a treatment process or equipment unless:

(1) The waste is treated, rendered, or mixed before or immediately after placement in the treatment process or equipment so that (i) 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 this chapter, and (ii) section 265.17(b) is complied with; or

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

(b) [Blank]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.406. 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 treatment process or equipment, unless 265.17(b) is complied with.

(b) Hazardous waste must not be placed in unwashed treatment equipment which previously held an incompatible waste or material, unless 265.17(b) is complied with.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART W
Drip Pads

265.440. 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 runoff 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 § 265.443(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 runoff nor runoff generated is not subject to regulation under 265.443(e) or 265.443(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 facility 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
- (iv) Manage the contaminated media in a manner consistent with State regulations.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.441. Assessment of existing drip pad integrity.

(a) For each existing drip pad as defined in 265.440, 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 265.443(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 a qualified Professional Engineer that attests to the results of the evaluation. The assessment must be reviewed, updated, and recertified annually until all upgrades, repairs, or modifications necessary to achieve compliance with all the standards of 265.443 are complete. The evaluation must document the extent to which the drip pad meets each of the design and operating standards of 265.443, except the standards for liners and leak detection systems, specified in 265.443(b).

(b) The owner or operator must develop a written plan for upgrading, repairing, and modifying the drip pad to meet the requirements of 265.443(b), and submit the plan to the Department 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 265.443. The plan must be reviewed and certified by a qualified Professional Engineer.

(c) Upon completion of all repairs and modifications, the owner or operator must submit to the Department the as-built drawings for the drip pad together with a certification by a qualified 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 265.443(m) of this subpart or close the drip pad in accordance with 265.445 of this subpart.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.442. 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 applicable requirements of §§ 265.443 (except § 265.443(a)(4)), 265.444 and 265.445 of this subpart, or
- (b) All of the applicable requirements of §§ 265.443 (except §§ 265.443(b)), 265.444 and 265.445 of this subpart.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

265.443. Design and operating requirements.

(a) Drip pads must:

(1) Be constructed of nonearthen materials, excluding wood and nonstructurally 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 1×10^{-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 1×10^{-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 § 265.442(b) instead of § 265.442(a). (added 12/93)

(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 a qualified 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.

(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 industry such as the American Concrete Institute (ACI) and 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 § 265.442(a) instead of § 265.442(b), the drip pad must have: (revised 12/93)

(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 prevent releases 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 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; and

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

(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 practicable 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 265.443(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 runoff.

(e) Unless protected by a structure, as described in 265.440(b) of this subpart, the owner or operator must design, construct, operate and maintain a runoff 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 runoff that might enter the system, or the drip pad is protected by a structure or cover, as described in 265.440(b) of this subpart.

(f) Unless protected by a structure or cover, as described in 265.440(b) of this subpart, the owner or operator must design, construct, operate and maintain a runoff 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 a qualified 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.

(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.

(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 activities by personnel or equipment.

(k) After being removed from the treatment vessel, treated wood from pressure and nonpressure 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 runoff and runoff 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, if the owner or operator detects a condition that 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 have caused or has caused a release of hazardous waste (e.g., upon detection of leakage by 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, remove any leakage from below the drip pad, and establish a schedule for accomplishing the clean up and repairs;

(iv) Within 24 hours after discovery of the condition, notify the Department of the condition and, within 10 working days, provide a written notice to the Department 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.

(2) The Department 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 Department 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) 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.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.444. 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, liners must be inspected and certified as meeting the requirements of 265.443 by a qualified Professional Engineer. This 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 runoff and runoff control systems;

(2) The presence of leakage in and proper functioning of leakage detection system.

(3) Deterioration or cracking of the drip pad surface.

Note: See 265.443(m) for remedial action required if deterioration or leakage is detected.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.445. 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 finds that not all contaminated subsoils can be practically removed or decontaminated, he must close the facility and perform postclosure care in accordance with closure and postclosure care requirements that apply to landfills (265.310). For permitted units, the requirement to have a permit continues throughout the postclosure period.

(c)(1) The owner or operator of an existing drip pad, as defined in 265.440 of this subpart, that does not comply with the liner requirements of 265.443(b)(1) must:

(i) Include in the closure plan for the drip pad under 265.112 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 postclosure plan under 265.118 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 265.112 and 265.144 of this part for closure and postclosure care of a drip pad subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent postclosure plan, but are not required to include the cost of expected closure under paragraph (a) of this section.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

SUBPART AA

Air Emission Standards for Process Events

265.1030. Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in 265.1).

(b) Except for 265.1034, 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 270, or

(2) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of R.61–79.262.17 (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 270, or

(3) A unit that is exempt from permitting under the provisions of R.61–79.262.17 (i.e., a “90-day” tank or container) and is not a recycling unit under the requirements of 261.6.

(c) [Reserved]

(d) 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.

Note: The requirements of 265.1032 through 265.1036 apply to process vents on hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under 261.4 and 265.1(c) are not affected by these requirements.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; SCSR 43–5 Doc. No. 4841, eff May 24, 2019.

265.1031. Definitions.

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1032. Standards: Process vents.

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

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

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

(b) If the owner or operator installs a closedvent system and control device to comply with the provisions of paragraph (a) of this section, the closedvent system and control device must meet the requirements of 265.1033.

(c) Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of 265.1034(c).

(d) When an owner or operator and the Department do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the test methods in 265.1034(c) shall be used to resolve the disagreement.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1033. Standards: Closed-vent systems and control devices.

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

(2)(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 requirements 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 requirements 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.

(iii) 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 cannot 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).

(b) A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95 weight percent or greater unless the total organic emission limits of 265.1032(a)(1) for all affected process vents can be attained at an efficiency less than 95 weight percent.

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

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

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

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

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

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

(iii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than the velocity, V_{MAX1} , 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_{MAX1} , as determined by the method specified in paragraph (e)(5) of this section.

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

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

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

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

where:

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

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

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

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

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

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

$$\text{Log}_{10}(V_{MAX}) = (H_T + 28.8)/31.7$$

where:

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

28.8 = Constant,

31.7 = Constant.

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

$$V_{MAX} = 8.706 + 0.7084(H_T)$$

where:

8.706 = Constant.

0.7084 = Constant.

H_T = The net heating value as determined in paragraph (c)(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 manufacturers specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control device inlet, but before being combined with other vent streams.

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

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

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

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

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

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

(vi) For a condenser, either:

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

(B) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature with an accuracy of ± 1 percent of the temperature being monitored in degrees Celsius ($^{\circ}\text{C}$) or $\pm 0.5^{\circ}\text{C}$, 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 such as a fixed bed carbon adsorber that regenerates the carbon bed directly in the control device, either:

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

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

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

(g) An owner or operator using a carbon adsorption system such as a fixed bed carbon adsorber that regenerates the carbon bed directly onsite in the control device, shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of 265.1035(b)(4)(iii)(F).

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

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of 265.1035(b)(4)(iii)(G), whichever is longer.

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of 265.1035(b)(4)(iii)(G).

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

(j) 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 265.1034(b) of this subpart, and by visual inspections; or

(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.

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

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

(k) 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 (j)(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 265.1034(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 (k)(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 265.1034(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 (k)(1)(ii)(A) of this section shall be monitored annually and at other times as requested by the Department, except as provided for in paragraph (n) of this section, using the procedures specified in 265.1034(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 (k)(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 265.1035 of this subpart.

(2) Each closed-vent system that is used to comply with paragraph (j)(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 (k)(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 265.1035 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 (k)(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 265.1035 of this subpart.

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

(m) 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 270 which implements the requirements of part 264 subpart X; 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 this part or of part 264; 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 270 which implements the requirements of part 264, subpart O; or

(ii) Has designed and operates the incinerator in accordance with the interim status requirements of subpart O of this part.

(3) Burned in a boiler or industrial furnace for which the owner or operator either:

(i) Has been issued a final permit under part 270 which implements the requirements of part 266, subpart H; or

(ii) Has designed and operates the boiler or industrial furnace in accordance with the interim status requirements of part 266, subpart H.

(n) Any components of a closed-vent system that are designated, as described in 265.1035(c)(9) of this subpart, as unsafe to monitor are exempt from the requirements of paragraph (k)(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 (k)(1)(ii)(B) of this section; and

(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 (k)(1)(ii)(B) of this section as frequently as practicable during safe-to-monitor times.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000.

265.1034. Test methods and procedures.

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

(b) When a closed-vent system is tested for compliance with no detectable emissions, as required in 265.1033(k) 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.

(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 nhexane and air at a concentration of approximately, but less than, 10,000 ppm methane or nhexane.

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

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

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

(c) Performance tests to determine compliance with 265.1032(a) and with the total organic compound concentration limit of 265.1033(c) shall comply with the following:

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

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

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

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

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

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

where:

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

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

n = Number of organic compounds in the vent gas;

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

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

0.0416 = Conversion factor for molar volume, kgmol/m³ (@ 293 K and 760 mm Hg);

10⁶ = Conversion from ppm, ppm⁻¹.

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

$$E_A = (E_H) (H)$$

where:

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

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

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

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

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

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

- (i) Sampling ports adequate for the test methods specified in paragraph (c)(1) of this section.
- (ii) Safe sampling platform(s).
- (iii) Safe access to sampling platform(s).
- (iv) Utilities for sampling and testing equipment.

(4) For the purpose of making compliance determinations, the timeweighted 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 operators control, compliance may, upon the Department'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, thinfilm 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 timeweighted, 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, thinfilm evaporation, solvent extraction, or air or steam stripping operation. For waste generated offsite, the grab samples must be collected at the inlet to the first waste management unit that receives the waste provided the waste has been transferred to the facility in a closed system such as a tank truck and the waste is not diluted or mixed with other waste.

(iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060 or 8260 of SW-846 (incorporated by reference under 260.11).

(iv) The arithmetic mean of the results of the analyses of the four samples shall apply for each waste stream managed in the unit in determining the timeweighted, annual average total organic concentration of the waste. The timeweighted 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, thinfilm evaporation, solvent extraction, or air or steam stripping operations manage hazardous wastes with timeweighted 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 Department do not agree on whether a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation manages a

hazardous waste with organic concentrations of at least 10 ppmw based on knowledge of the waste, the procedures in Method 8260 of SW-846 (incorporated by reference under 260.11) may be used to resolve the dispute.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1035. Recordkeeping requirements.

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

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

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

(1) For facilities that comply with the provisions of 265.1033(a)(2), an implementation schedule that includes dates by which the closedvent system and control device will be installed and in operation. The schedule must also include a rationale of why the installation cannot be completed at an earlier date. The implementation schedule must be in the facility operating record by the effective date that the facility becomes subject to the provisions of this subpart.

(2) Up-to-date documentation of compliance with the process vent standards in 265.1032, including:

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

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

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

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

(ii) A detailed engineering description of the closedvent system and control device including:

(A) Manufacturers name and model number of control device.

(B) Type of control device.

(C) Dimensions of the control device.

(D) Capacity.

(E) Construction materials.

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

(4) Documentation of compliance with 265.1033 shall include the following information:

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

(ii) Records, including the dates, of each compliance test required by 265.1033(j).

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

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

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

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

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in 265.1033(d).

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

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

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

(iv) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the

hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(v) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 percent or greater unless the total organic concentration limit of 265.1032(a) is achieved at an efficiency less than 95 weight percent or the total organic emission limits of 265.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent. A statement provided by the control device manufacturer or vendor certifying that the control equipment meets the design specifications may be used to comply with this requirement.

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

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

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

(2) Identification of operating parameter, description of monitoring device, and diagram of monitoring sensor location or locations used to comply with 265.1033(f)(1) and (f)(2).

(3) Monitoring, operating and inspection information required by paragraphs (f) through (k) of 265.1033 of this subpart.

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

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

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

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

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

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

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

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

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

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

(vi) For a condenser that complies with 265.1033(f)(2)(vi)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the condenser are more than 20 percent greater than the design outlet organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(vii) For a condenser that complies with 265.1033(f)(2)(vi)(B), period when:

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

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

(viii) For a carbon adsorption system such as a fixed bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with 265.1033(f)(2)(vii)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the carbon bed are more than 20 percent greater than the design exhaust vent stream organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(ix) For a carbon adsorption system such as a fixed bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with 265.1033(f)(2)(vii)(B), period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time established as a requirement of paragraph (b)(4)(iii)(F) of this section.

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

(6) For carbon adsorption systems operated subject to requirements specified in 265.1033(g) or 265.1033(h)(2), date when existing carbon in the control device is replaced with fresh carbon.

(7) For carbon adsorption systems operated subject to requirements specified in 265.1033(h)(1), a log that records:

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

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

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

(9) An owner or operator designating any components of a closed-vent system as unsafe to monitor pursuant to 265.1033(n) 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 265.1033(n) 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 265.1033(k) 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.

(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 3 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, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(f) Up-to-date information and data used to determine whether or not a process vent is subject to the requirements in 265.1032 including supporting documentation as required by 265.1034(d)(2) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used, shall be recorded in a log that is kept in the facility operating record.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

SUBPART BB
Air Emissions Standards for Equipment

265.1050. Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in 265.1).

(b) Except as provided in 265.1064(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 270, or

(2) A unit (including a hazardous waste recycling unit) that is not exempt from permitting under the provisions of R.61-79.262.17 (i.e., a hazardous waste recycling unit that is not a ninety (90)-day tank or container) and that is located at a hazardous waste management facility otherwise subject to the permitting requirements of part 270, or

(3) A unit that is exempt from permitting under the provisions of R.61-79.262.17 (i.e., a “ninety (90)-day” tank or container) and is not a recycling unit under the provisions of 261.6.

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

(d) Equipment that is in vacuum service is excluded from the requirements of 265.1052 to 265.1060 if it is identified as required in 265.1064(g)(5).

(e) Equipment that contains or contacts hazardous waste with an organic concentration of at least 10 percent by weight for a period of less than 300 hours per calendar year is excluded from the requirements of 265.1052 through 265.1060 of this subpart if it is identified as required in 265.1064(g)(6) of this subpart.

Note: The requirements of 265.1052 through 265.1064 apply to equipment associated with hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under 261.4 and 265.1(c) are not affected by these requirements.

(f) [Reserved]

(g) Purged coatings and solvents from surface coating operations subject to the national emission standards for hazardous air pollutants (NESHAP) for the surface coating of automobiles and light-duty trucks at 40 CFR part 63, subpart IIII, are not subject to the requirements of this subpart.

[Note: The requirements of 265.1052 through 265.1064 apply to equipment associated with hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under 261.4 and 265.1(c) are not affected by these requirements.]

HISTORY: Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 30, Issue No. 6, eff June 23, 2006; SCSR 43-5 Doc. No. 4841, eff May 24, 2019.

Editor’s Note

Paragraph (f) reserved in 2012 to correct a typographical error.

265.1051. Definitions.

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1052. Standards: Pumps in light liquid service.

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in 265.1063(b), except as provided in paragraphs (d), (e), and (f) of this section.

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

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

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

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 265.1059.

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

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

(1) Each dual mechanical seal system must be:

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

(ii) Equipped with a barrier fluid degassing reservoir that is connected by a closedvent system to a control device that complies with the requirements of 265.1060, or

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

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

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

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

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

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

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

(ii) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 265.1059.

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

(e) Any pump that is designated, as described in 265.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump meets the following requirements:

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

(2) Must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in 265.1063(c).

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

(f) If any pump is equipped with a closedvent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of 265.1060, it is exempt from the requirements of paragraphs (a) through (e) of this section.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1053. Standards: Compressors.

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

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

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

(2) Equipped with a barrier fluid system that is connected by a closedvent system to a control device that complies with the requirements of 265.1060, or

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

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

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

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

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

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

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 265.1059.

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

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a closedvent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of 265.1060, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in 265.1064(g)(2), for no detectable emission as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is determined to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in 265.1063(c).

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1054. Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in 265.1063(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in 265.1059.

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

reading of less than 500 ppm above background, as measured by the method specified in 265.1063(c).

(c) Any pressure relief device that is equipped with a closedvent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in 265.1060 is exempt from the requirements of paragraphs (a) and (b) of this section.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1055. 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:

(1) Return the purged process fluid directly to the process line ; or

(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 265.1085 through 265.1087 of this subpart or a control device that complies with the requirements of 265.1060 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.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1056. Standards: Open ended valves or lines.

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

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

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

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1057. Standards: Valves in gas/vapor service or in light liquid service.

(a) Each valve in gas/vapor or light liquid service shall be monitored monthly to detect leaks by the methods specified in 265.1063(b) and shall comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section and 265.1061 and 265.1062.

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

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

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

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in 265.1059.

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

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

(1) Tightening of bonnet bolts.

- (2) Replacement of bonnet bolts.
- (3) Tightening of packing gland nuts.
- (4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in 265.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

- (1) Has no external actuating mechanism in contact with the hazardous waste stream.
- (2) Is operated with emissions less than 500 ppm above background as determined by the method specified in 265.1063(c).
- (3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times as requested by the Department.

(g) Any valve that is designated, as described in 265.1064(h)(1), as an unsafe to monitor valve is exempt from the requirements of paragraph (a) of this section if:

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

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

(h) Any valve that is designated, as described in 265.1064(h)(2), as a difficult to monitor valve is exempt from the requirements of paragraph (a) of this section if:

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

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

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1058. Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors.

(a) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in 265.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.

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

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in 265.1059.

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

(d) First attempts at repair include, but are not limited to, the best practices described under 265.1057(e).

(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 Record keeping requirements of 265.1064 of this subpart.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1059. Standards: Delay of repair.

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

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

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

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

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with 265.1060.

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

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

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

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

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992.

265.1060. 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 265.1033 of this part.

(b)(1) The owner or operator of an existing facility who can not 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 units that begin operation after December 21, 1990, and are 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.

(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 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.

(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).

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

265.1061. Alternative standards for valves in gas/vapor service or in light liquid service: percentage of valves allowed to leak.

(a) An owner or operator subject to the requirements of 265.1057 may elect to have all valves within a hazardous waste management unit comply with an alternative standard which allows no greater than 2 percent of the valves to leak.

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

(1) 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 Department.

(2) If a valve leak is detected, it shall be repaired in accordance with 265.1057 (d) and (e).

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

(1) All valves subject to the requirements in 265.1057 within the hazardous waste management unit shall be monitored within 1 week by the methods specified in 265.1063(b).

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

(3) The leak percentage shall be determined by dividing the number of valves subject to the requirements in 265.1057 for which leaks are detected by the total number of valves subject to the requirements in 265.1057 within the hazardous waste management unit.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.1062. 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 265.1057 may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of this section.

(b)(1) An owner or operator shall comply with the requirements for valves, as described in 265.1057, except as described in paragraphs (b)(2) and (b)(3) of this section.

(2) After two consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip one of the quarterly leak detection periods (i.e., monitor for leaks once every six months) for the valves subject to the requirements in 265.1057 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 265.1057 of this subpart.

(4) If the percentage of valves leaking is greater than 2 percent, the owner or operators shall monitor monthly in compliance with the requirements in 265.1057, but may again elect to use this section after meeting the requirements of 265.1057(c)(1).

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.1063. Test methods and procedures.

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

(b) Leak detection monitoring, as required in 265.1052 through 265.1062, shall comply with the following requirements:

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

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

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

(4) Calibration gases shall be:

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

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

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

(c) When equipment is tested for compliance with no detectable emissions, as required in 265.1052(e), 265.1053(i), 265.1054, and 265.1057(f), the test shall comply with the following requirements:

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

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

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

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

(d) In accordance with the waste analysis plan required by 265.13(b), an owner or operator of a facility must determine, for each piece of equipment, whether the equipment contains or contacts a hazardous waste with organic concentration that equals or exceeds 10 percent by weight using the following:

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

(2) Method 9060 or 8260 of SW-846 (incorporated by reference under 260.11); or

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

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

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

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

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

(i) Performance tests to determine if a control device achieves 95 weight percent organic emission reduction shall comply with the procedures of 265.1034 (c)(1) through (c)(4).

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1064. Recordkeeping requirements.

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

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous

waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

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

(1) For each piece of equipment to which subpart BB of part 265 applies:

- (i) Equipment identification number and hazardous waste management unit identification.
- (ii) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).
- (iii) Type of equipment (e.g., a pump or pipeline valve).
- (iv) Percent by weight total organics in the hazardous waste stream at the equipment.
- (v) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).
- (vi) Method of compliance with the standard (e.g., monthly leak detection and repair or equipped with dual mechanical seals).

(2) For facilities that comply with the provisions of 265.1033(a)(2), an implementation schedule as specified in 265.1033(a)(2).

(3) Where an owner or operator chooses to use test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan as specified in 265.1035(b)(3).

(4) Documentation of compliance with 265.1060, including the detailed design documentation or performance test results specified in 265.1035(b)(4).

(c) When each leak is detected as specified in 265.1052, 265.1053, 265.1057, and 265.1058, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, the date evidence of a potential leak was found in accordance with 265.1058(a), and the date the leak was detected, shall be attached to the leaking equipment.

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

(3) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in 265.1057(c) and no leak has been detected during those 2 months.

(d) When each leak is detected as specified in 265.1052, 265.1053, 265.1057, and 265.1058, the following information shall be recorded in an inspection log and shall be kept in the facility operating record:

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

(2) The date evidence of a potential leak was found in accordance with 265.1058(a).

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

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

(5) Above 10,000 if the maximum instrument reading measured by the methods specified in 265.1063(b) after each repair attempt is equal to or greater than 10,000 ppm.

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

(7) Documentation supporting the delay of repair of a valve in compliance with 265.1059(c).

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

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

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

(e) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of 265.1060 shall be recorded and kept up to date in the facility operating record as specified in 265.1035(c). Design documentation

is specified in 265.1035 (c)(1) and (c)(2) and monitoring, operating, and inspection information in 265.1035 (c)(3) 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, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(g) The following information pertaining to all equipment subject to the requirements in 265.1052 through 265.1060 shall be recorded in a log that is kept in the facility operating record:

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

(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, under the provisions of 265.1052(e), 265.1053(i), and 265.1057(f).

(ii) The designation of this equipment as subject to the requirements of 265.1052(e), 265.1053(i), or 265.1057(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with 265.1054(a).

(4)(i) The dates of each compliance test required in 265.1052(e), 265.1053(i), 265.1054, and 265.1057(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(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 a period of less than 300 hours per year.

(h) The following information pertaining to all valves subject to the requirements of 265.1057 (g) and (h) shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

(2) A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.

(i) The following information shall be recorded in the facility operating record for valves complying with 265.1062:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(j) The following information shall be recorded in a log that is kept in the facility operating record:

(1) Criteria required in 265.1052(d)(5)(ii) and 265.1053(e)(2) and an explanation of the criteria.

(2) Any changes to these criteria and the reasons for the changes.

(k) The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions as provided in the applicability section of this subpart and other specific subparts:

(1) An analysis determining the design capacity of the hazardous waste management unit.

(2) A statement listing the hazardous waste influent to and effluent from each hazardous waste management unit subject to the requirements in 265.1052 through 265.1060 and an analysis determining whether these hazardous wastes are heavy liquids.

(3) An up to date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements in 265.1052 through 265.1060. The record shall

include supporting documentation as required by 265.1063(d)(3) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used. If the owner or operator takes any action (e.g., changing the process that produced the waste) that could result in an increase in the total organic content of the waste contained in or contacted by equipment determined not to be subject to the requirements in 265.1052 through 265.1060, then a new determination is required.

(l) Records of the equipment leak information required by paragraph (d) of this section and the operating information required by paragraph (e) of this section need be kept only 3 years.

(m) The owner or operator of any facility with equipment that is subject to this subpart and to leak detection, monitoring, and repair requirements under regulations at 40 CFR part 60, part 61, or part 63 may elect to determine compliance with this subpart either by documentation pursuant to 265.1064 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 regulation at 40 CFR part 60, part 61, or part 63 shall be kept with or made readily available with the facility operating record. (11/99)

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000.

SUBPART CC

Air Emission Standards for Tanks, Surface Impoundments, and Containers

265.1080. Applicability.

(a) The requirements of this subpart apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either subpart I, J, or K of this part except as 265.1 and paragraph (b) of this section provide otherwise.

(b) The requirements of this subpart do not apply to the following waste management units at the facility:

(1) A waste management unit that holds hazardous waste placed in the unit before December 6, 1996, and in which no hazardous waste is added to the unit on or after December 6, 1996.

(2) A container that has a design capacity less than or equal to 0.1 m³.

(3) A tank in which an owner or operator has stopped adding hazardous waste and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

(4) A surface impoundment in which an owner or operator has stopped adding hazardous waste (except to implement an approved closure plan) and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

(5) A waste management unit that is used solely for on-site treatment or storage of hazardous waste that is placed in the unit as a result of implementing remedial activities required under the corrective action authorities of RCRA sections 3004(u), 3004(v), or 3008(h), CERCLA authorities, or similar Federal or State authorities.

(6) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.

(7) A hazardous waste management unit that the owner or operator certifies is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR part 60, part 61, or part 63. For the purpose of complying with this paragraph, a tank for which the air emission control includes an enclosure, as opposed to a cover, must be in compliance with the enclosure and control device requirements of 265.1085(i), except as provided in 265.1083(c)(5).

(8) A tank that has a process vent as defined in 264.1031.

(c) For the owner and operator of a facility subject to this subpart who has received a final permit under RCRA section 3005 prior to December 6, 1996, the following requirements apply:

(1) The requirements of part 264, subpart CC shall be incorporated into the permit when the permit is reissued in accordance with the requirements of 124.15 or reviewed in accordance with the requirements of 270.50(d).

(2) Until the date when the permit is reissued in accordance with the requirements of 124.15 or reviewed in accordance with the requirements of 270.50(d), the owner and operator is subject to the requirements of this subpart.

(d) The requirements of this subpart, except for the recordkeeping requirements specified in 265.1090(i) of this subpart, are administratively stayed for a tank or a container used for the management of hazardous waste generated by organic peroxide manufacturing and its associated laboratory operations when the owner or operator of the unit meets all of the following conditions:

(1) The owner or operator identifies that the tank or container receives hazardous waste generated by an organic peroxide manufacturing process producing more than one functional family of organic peroxides or multiple organic peroxides within one functional family, that one or more of these organic peroxides could potentially undergo self-accelerating thermal decomposition at or below ambient temperatures, and that organic peroxides are the predominant products manufactured by the process. For the purpose of meeting the conditions of this paragraph, "organic peroxide" means an organic compound that contains the bivalent-O-O-structure and which may be considered to be a structural derivative of hydrogen peroxide where one or both of the hydrogen atoms has been replaced by an organic radical.

(2) The owner or operator prepares documentation, in accordance with the requirements of 265.1090(i) of this subpart, explaining why an undue safety hazard would be created if air emission controls specified in 265.1085 through 265.1088 of this subpart are installed and operated on the tanks and containers used at the facility to manage the hazardous waste generated by the organic peroxide manufacturing process or processes meeting the conditions of paragraph (d)(1) of this section.

(3) The owner or operator notifies the Department in writing that hazardous waste generated by an organic peroxide manufacturing process or processes meeting the conditions of paragraph (d)(1) of this section are managed at the facility in tanks or containers meeting the conditions of paragraph (d)(2) of this section. The notification shall state the name and address of the facility, and be signed and dated by an authorized representative of the facility owner or operator.

(e) [Reserved]

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 25, Issue No. 10, eff October 26, 2001.

265.1081. Definitions.

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

"Average volatile organic concentration" or "average VO concentration" means the mass-weighted average volatile organic concentration of a hazardous waste as determined in accordance with the requirements of 265.1084 of this subpart.

"Closure device" means a cap, hatch, lid, plug, seal, valve, or other type of fitting that blocks an opening in a cover such that when the device is secured in the closed position it prevents or reduces air pollutant emissions to the atmosphere. Closure devices include devices that are detachable from the cover (e.g., a sampling port cap), manually operated (e.g., a hinged access lid or hatch), or automatically operated (e.g., a spring-loaded pressure relief valve).

"Continuous seal" means a seal that forms a continuous closure that completely covers the space between the edge of the floating roof and the wall of a tank. A continuous seal may be a vapor-mounted seal, liquid-mounted seal, or metallic shoe seal. A continuous seal may be constructed of fastened segments so as to form a continuous seal.

"Cover" means a device that provides a continuous barrier over the hazardous waste managed in a unit to prevent or reduce air pollutant emissions to the atmosphere. A cover may have openings (such as access hatches, sampling ports, gauge wells) that are necessary for operation, inspection, maintenance, and repair of the unit on which the cover is used. A cover may be a separate piece of equipment

which can be detached and removed from the unit or a cover may be formed by structural features permanently integrated into the design of the unit.

“Enclosure” means a structure that surrounds a tank or container, captures organic vapors emitted from the tank or container, and vents the captured vapors through a closed-vent system to a control device.

“External floating roof” means a pontoon-type or double-deck type cover that rests on the surface of the material managed in a tank with no fixed roof.

“Fixed roof” means a cover that is mounted on a unit in a stationary position and does not move with fluctuations in the level of the material managed in the unit.

“Floating membrane cover” means a cover consisting of a synthetic flexible membrane material that rests upon and is supported by the hazardous waste being managed in a surface impoundment.

“Floating roof” means a cover consisting of a double deck, pontoon single deck, or internal floating cover which rests upon and is supported by the material being contained, and is equipped with a continuous seal.

“Hard-piping” means pipe or tubing that is manufactured and properly installed in accordance with relevant standards and good engineering practices.

“In light material service” means the container is used to manage a material for which both of the following conditions apply: the vapor pressure of one or more of the organic constituents in the material is greater than 0.3 kilopascals (kPa) at 20°C; and the total concentration of the pure organic constituents having a vapor pressure greater than 0.3 kPa at 20°C is equal to or greater than 20 percent by weight.

“Internal floating roof” means a cover that rests or floats on the material surface (but not necessarily in complete contact with it) inside a tank that has a fixed roof.

“Liquid-mounted seal” means a foam or liquid-filled primary seal mounted in contact with the hazardous waste between the tank wall and the floating roof continuously around the circumference of the tank.

Malfunction means any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or usual manner. Failures that are caused in part by poor maintenance or careless operation are not malfunctions.

“Maximum organic vapor pressure” means the sum of the individual organic constituent partial pressures exerted by the material contained in a tank, at the maximum vapor pressure-causing conditions (i.e., temperature, agitation, pH effects of combining wastes, etc.) reasonably expected to occur in the tank. For the purpose of this subpart, maximum organic vapor pressure is determined using the procedures specified in 265.1084(c) of this subpart.

“Metallic shoe seal” means a continuous seal that is constructed of metal sheets which are held vertically against the wall of the tank by springs, weighted levers, or other mechanisms and is connected to the floating roof by braces or other means. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

“No detectable organic emissions” means no escape of organics to the atmosphere as determined using the procedure specified in 265.1084(d) of this subpart.

“Point of waste origination” means as follows:

(1) When the facility owner or operator is the generator of the hazardous waste, the point of waste origination means the point where a solid waste produced by a system, process, or waste management unit is determined to be a hazardous waste as defined in part 261.

[Note: In this case, this term is being used in a manner similar to the use of the term “point of generation” in air standards established for waste management operations under authority of the Clean Air Act in 40 CFR parts 60, 61, and 63.]

(2) When the facility owner and operator are not the generator of the hazardous waste, point of waste origination means the point where the owner or operator accepts delivery or takes possession of the hazardous waste.

“Point of waste treatment” means the point where a hazardous waste to be treated in accordance with 265.1083(c)(2) of this subpart exits the treatment process. Any waste determination shall be made

before the waste is conveyed, handled, or otherwise managed in a manner that allows the waste to volatilize to the atmosphere.

“Safety device” means a closure device such as a pressure relief valve, frangible disc, fusible plug, or any other type of device which functions exclusively to prevent physical damage or permanent deformation to a unit or its air emission control equipment by venting gases or vapors directly to the atmosphere during unsafe conditions resulting from an unplanned, accidental, or emergency event. For the purpose of this subpart, a safety device is not used for routine venting of gases or vapors from the vapor headspace underneath a cover such as during filling of the unit or to adjust the pressure in this vapor headspace in response to normal daily diurnal ambient temperature fluctuations. A safety device is designed to remain in a closed position during normal operations and open only when the internal pressure, or another relevant parameter, exceeds the device threshold setting applicable to the air emission control equipment as determined by the owner or operator based on manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials.

“Single-seal system” means a floating roof having one continuous seal. This seal may be vapor-mounted, liquid-mounted, or a metallic shoe seal.

“Vapor-mounted seal” means a continuous seal that is mounted such that there is a vapor space between the hazardous waste in the unit and the bottom of the seal.

“Volatile organic concentration” or “VO concentration” means the fraction by weight of the volatile organic compounds contained in a hazardous waste expressed in terms of parts per million (ppmw) as determined by direct measurement or by knowledge of the waste in accordance with the requirements of 265.1084 of this subpart. For the purpose of determining the VO concentration of a hazardous waste, organic compounds with a Henry’s law constant value of at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in the liquid-phase (0.1 Y/X) (which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³) at 25 degrees Celsius must be included. Appendix VI of this subpart presents a list of compounds known to have a Henry’s law constant value less than the cutoff level.

“Waste determination” means performing all applicable procedures in accordance with the requirements of 265.1084 of this subpart to determine whether a hazardous waste meets standards specified in this subpart. Examples of a waste determination include performing the procedures in accordance with the requirements of 265.1084 of this subpart to determine the average VO concentration of a hazardous waste at the point of waste origination; the average VO concentration of a hazardous waste at the point of waste treatment and comparing the results to the exit concentration limit specified for the process used to treat the hazardous waste; the organic reduction efficiency and the organic biodegradation efficiency for a biological process used to treat a hazardous waste and comparing the results to the applicable standards; or the maximum volatile organic vapor pressure for a hazardous waste in a tank and comparing the results to the applicable standards.

“Waste stabilization process” means any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids as determined by Test Method 9095 (Paint Filter Liquids Test) in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference-refer to 260.11 of this chapter). A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are “waste fixation” or “waste solidification.” This does not include the adding of absorbent materials to the surface of a waste, without mixing, agitation, or subsequent curing, to absorb free liquid.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1082. Schedule for implementation of air emission standards.

(a) Owners or operators of facilities existing on December 6, 1996 and subject to subparts I, J, and K of this part shall meet the following requirements:

- (1) Install and begin operation of all control equipment or waste management units required to comply with this subpart and complete modifications of production or treatment processes to satisfy exemption criteria in accordance with 265.1083(c) of this subpart by December 6, 1996, except as provided for in paragraph (a)(2) of this section.

(2) When control equipment or waste management units required to comply with this subpart cannot be installed and in operation or modifications of production or treatment processes to satisfy exemption criteria in accordance with 265.1083(c) of this subpart cannot be completed by December 6, 1996, the owner or operator shall:

(i) Install and begin operation of the control equipment and waste management units, and complete modifications of production or treatment processes as soon as possible but no later than December 8, 1997.

(ii) Prepare an implementation schedule that includes the following information: specific calendar dates for award of contracts or issuance of purchase orders for control equipment, waste management units, and production or treatment process modifications; initiation of on-site installation of control equipment or waste management units, and modifications of production or treatment processes; completion of control equipment or waste management unit installation, and production or treatment process modifications; and performance of testing to demonstrate that the installed equipment or waste management units, and modified production or treatment processes meet the applicable standards of this subpart.

(iii) For facilities subject to the recordkeeping requirements of 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this section in the operating record no later than December 6, 1996.

(iv) For facilities not subject to 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this section in a permanent, readily available file located at the facility no later than December 6, 1996.

(b) Owners or operators of facilities and units in existence on the effective date of a statutory or regulatory amendment that renders the facility subject to subparts I, J, or K of this part shall meet the following requirements:

(1) Install and begin operation of control equipment or waste management units required to comply with this subpart, and complete modifications of production or treatment processes to satisfy exemption criteria of 265.1083(c) of this subpart by the effective date of the amendment, except as provided for in paragraph (b)(2) of this section.

(2) When control equipment or waste management units required to comply with this subpart cannot be installed and begin operation, or when modifications of production or treatment processes to satisfy exemption criteria of 265.1083(c) of this subpart cannot be completed by the effective date of the amendment, the owner or operator shall:

(i) Install and begin operation of the control equipment or waste management unit, and complete modification of production or treatment processes as soon as possible but no later than 30 months after the effective date of the amendment.

(ii) For facilities subject to the recordkeeping requirements of 265.73, enter and maintain the implementation schedule specified in paragraph (a)(2)(ii) of this section in the operating record no later than the effective date of the amendment, or

(iii) For facilities not subject to 265.73, the owner or operator shall enter and maintain the implementation schedule specified in paragraph (a)(2)(ii) of this section in a permanent, readily available file located at the facility site no later than the effective date of the amendment.

(c) 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) 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).

(d) The Department may elect to extend the implementation date for control equipment at a facility, on a case by case basis, to a date later than December 8, 1997, when special circumstances that are beyond the facility owner's or operator's control delay installation or operation of control equipment, and the owner or operator has made all reasonable and prudent attempts to comply with the requirements of this subpart.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

265.1083. Standards: General.

(a) This section applies to the management of hazardous waste in tanks, surface impoundments, and containers subject to this subpart.

(b) The owner or operator shall control air pollutant emissions from each hazardous waste management unit in accordance with standards specified in 265.1085 through 265.1088 of this subpart, as applicable to the hazardous waste management unit, except as provided for in paragraph (c) of this section.

(c) A tank, surface impoundment, or container is exempt from standards specified in 265.1085 through 265.1088 of this subpart, as applicable, provided that the waste management unit is one of the following:

(1) A tank, surface impoundment, or container for which all hazardous waste entering the unit has an average VO concentration at the point of waste origination of less than 500 parts per million by weight (ppmw). The average VO concentration shall be determined using the procedures specified in 265.1084(a) of this subpart. The owner or operator shall review and update, as necessary, this determination at least once every 12 months following the date of the initial determination for the hazardous waste streams entering the unit.

(2) A tank, surface impoundment, or container for which the organic content of all the hazardous waste entering the waste management unit has been reduced by an organic destruction or removal process that achieves any one of the following conditions:

(i) A process that removes or destroys the organics contained in the hazardous waste to a level such that the average VO concentration of the hazardous waste at the point of waste treatment is less than the exit concentration limit (C_t) established for the process. The average VO concentration of the hazardous waste at the point of waste treatment and the exit concentration limit for the process shall be determined using the procedures specified in 265.1084(b) of this subpart.

(ii) A process that removes or destroys the organics contained in the hazardous waste to a level such that the organic reduction efficiency (R) for the process is equal to or greater than 95 percent, and the average VO concentration of the hazardous waste at the point of waste treatment is less than 100 ppmw. The organic reduction efficiency for the process and the average VO concentration of the hazardous waste at the point of waste treatment shall be determined using the procedures specified in 265.1084(b) of this subpart.

(iii) A process that removes or destroys the organics contained in the hazardous waste to a level such that the actual organic mass removal rate (MR) for the process is equal to or greater than the required organic mass removal rate (RMR) established for the process. The required organic mass removal rate and the actual organic mass removal rate for the process shall be determined using the procedures specified in 265.1084(b) of this subpart.

(iv) A biological process that destroys or degrades the organics contained in the hazardous waste, such that either of the following conditions is met:

(A) The organic reduction efficiency (R) for the process is equal to or greater than 95 percent, and the organic biodegradation efficiency (R_{bio}) for the process is equal to or greater than 95 percent. The organic reduction efficiency and the organic biodegradation efficiency for the process shall be determined using the procedures specified in 265.1084(b) of this subpart.

(B) The total actual organic mass biodegradation rate (MR_{bio}) for all hazardous waste treated by the process is equal to or greater than the required organic mass removal rate (RMR). The required organic mass removal rate and the actual organic mass biodegradation rate for the process shall be determined using the procedures specified in 265.1084(b) of this subpart.

(v) A process that removes or destroys the organics contained in the hazardous waste and meets all of the following conditions:

(A) From the point of waste origination through the point where the hazardous waste enters the treatment process, the hazardous waste is managed continuously in waste management units which use air emission controls in accordance with the standards specified in 265.1085 through 265.1088 of this subpart, as applicable to the waste management unit.

(B) From the point of waste origination through the point where the hazardous waste enters the treatment process, any transfer of the hazardous waste is accomplished through continuous

hard-piping or other closed system transfer that does not allow exposure of the waste to the atmosphere. The EPA considers a drain system that meets the requirements of 40 CFR part 63, subpart RR—National Emission Standards for Individual Drain Systems to be a closed system.

(C) The average VO concentration of the hazardous waste at the point of waste treatment is less than the lowest average VO concentration at the point of waste origination determined for each of the individual waste streams entering the process or 500 ppmw, whichever value is lower. The average VO concentration of each individual waste stream at the point of waste origination shall be determined using the procedures specified in 265.1084(a) of this subpart. The average VO concentration of the hazardous waste at the point of waste treatment shall be determined using the procedures specified in 265.1084(b) of this subpart.

(vi) A process that removes or destroys the organics contained in the hazardous waste to a level such that the organic reduction efficiency (R) for the process is equal to or greater than 95 percent and the owner or operator certifies that the average VO concentration at the point of waste origination for each of the individual waste streams entering the process is less than 10,000 ppmw. The organic reduction efficiency for the process and the average VO concentration of the hazardous waste at the point of waste origination shall be determined using the procedures specified in 265.1084(b) and 265.1084(a) of this subpart, respectively.

(vii) A hazardous waste incinerator for which the owner or operator has either:

(A) Been issued a final permit under part 270 which implements the requirements of part 264, subpart O; or

(B) Has designed and operates the incinerator in accordance with the interim status requirements of subpart O of this part.

(viii) A boiler or industrial furnace for which the owner or operator has either:

(A) Been issued a final permit under part 270 which implements the requirements of part 266, subpart H, or

(B) Has designed and operates the boiler or industrial furnace in accordance with the interim status requirements of part 266, subpart H.

(ix) For the purpose of determining the performance of an organic destruction or removal process in accordance with the conditions in each of paragraphs (c)(2)(i) through (c)(2)(vi) of this section, the owner or operator shall account for VO concentrations determined to be below the limit of detection of the analytical method by using the following VO concentration:

(A) If Method 25D in 40 CFR part 60, appendix A is used for the analysis, one-half the blank value determined in the method at section 4.4 of Method 25D in 40 CFR part 60, appendix A, or a value of 25 ppmw, whichever is less.

(B) If any other analytical method is used, one-half the sum of the limits of detection established for each organic constituent in the waste that has a Henry's law constant value at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in-the-liquid-phase (0.1 Y/X) [which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³] at 25 degrees Celsius.

(3) A tank or surface impoundment used for biological treatment of hazardous waste in accordance with the requirements of paragraph (c)(2)(iv) of this section.

(4) A tank, surface impoundment, or container for which all hazardous waste placed in the unit either:

(i) Meets the numerical concentration limits for organic hazardous constituents, applicable to the hazardous waste, as specified in part 268—Land Disposal Restrictions under Table "Treatment Standards for Hazardous Waste" in 268.40; or

(ii) The organic hazardous constituents in the waste have been treated by the treatment technology established by the EPA for the waste in 268.42(a), or have been removed or destroyed by an equivalent method of treatment approved by EPA pursuant to 268.42(b).

(5) A tank used for bulk feed of hazardous waste to a waste incinerator and all of the following conditions are met:

(i) The tank is located inside an enclosure vented to a control device that is designed and operated in accordance with all applicable requirements specified under 40 CFR part 61, subpart

FF—National Emission Standards for Benzene Waste Operations for a facility at which the total annual benzene quantity from the facility waste is equal to or greater than 10 megagrams per year;

(ii) The enclosure and control device serving the tank were installed and began operation prior to November 25, 1996; and

(iii) The enclosure is designed and operated in accordance with the criteria for a permanent total enclosure as specified in “Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure” under 40 CFR 52.741, Appendix B. The enclosure may have permanent or temporary openings to allow worker access; passage of material into or out of the enclosure by conveyor, vehicles, or other mechanical or electrical equipment; or to direct air flow into the enclosure. The owner or operator shall perform the verification procedure for the enclosure as specified in Section 5.0 to “Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure” annually.

(d) The Department may at any time perform or request that the owner or operator perform a waste determination for a hazardous waste managed in a tank, surface impoundment, or container exempted from using air emission controls under the provisions of this section as follows:

(1) The waste determination for average VO concentration of a hazardous waste at the point of waste origination shall be performed using direct measurement in accordance with the applicable requirements of 265.1084(a) of this subpart. The waste determination for a hazardous waste at the point of waste treatment shall be performed in accordance with the applicable requirements of 265.1084(b) of this subpart.

(2) In performing a waste determination pursuant to paragraph (d)(1) of this section, the sample preparation and analysis shall be conducted as follows:

(i) In accordance with the method used by the owner or operator to perform the waste analysis, except in the case specified in paragraph (d)(2)(ii) of this section.

(ii) If the Department determines that the method used by the owner or operator was not appropriate for the hazardous waste managed in the tank, surface impoundment, or container, then the Department may choose an appropriate method.

(3) In a case when the owner or operator is requested to perform the waste determination, the Department may elect to have an authorized representative observe the collection of the hazardous waste samples used for the analysis.

(4) In a case when the results of the waste determination performed or requested by the Department do not agree with the results of a waste determination performed by the owner or operator using knowledge of the waste, then the results of the waste determination performed in accordance with the requirements of paragraph (d)(1) of this section shall be used to establish compliance with the requirements of this subpart.

(5) In a case when the owner or operator has used an averaging period greater than 1 hour for determining the average VO concentration of a hazardous waste at the point of waste origination, the Department may elect to establish compliance with this subpart by performing or requesting that the owner or operator perform a waste determination using direct measurement based on waste samples collected within a 1-hour period as follows:

(i) The average VO concentration of the hazardous waste at the point of waste origination shall be determined by direct measurement in accordance with the requirements of 265.1084(a) of this subpart.

(ii) Results of the waste determination performed or requested by the Department showing that the average VO concentration of the hazardous waste at the point of waste origination is equal to or greater than 500 ppmw shall constitute noncompliance with this subpart except in a case as provided for in paragraph (d)(5)(iii) of this section.

(iii) For the case when the average VO concentration of the hazardous waste at the point of waste origination previously has been determined by the owner or operator using an averaging period greater than 1 hour to be less than 500 ppmw but because of normal operating process variations the VO concentration of the hazardous waste determined by direct measurement for any given 1-hour period may be equal to or greater than 500 ppmw, information that was used by the owner or operator to determine the average VO concentration of the hazardous waste (e.g.,

test results, measurements, calculations, and other documentation) and recorded in the facility records in accordance with the requirements of 265.1084(a) and 265.1090 of this subpart shall be considered by the Department together with the results of the waste determination performed or requested by the Department in establishing compliance with this subpart.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

265.1084. Waste determination procedures.

(a) Waste determination procedure to determine average volatile organic (VO) concentration of a hazardous waste at the point of waste origination.

(1) An owner or operator shall determine the average VO concentration at the point of waste origination for each hazardous waste placed in a waste management unit exempted under the provisions of 265.1083(c)(1) of this subpart from using air emission controls in accordance with standards specified in 265.1085 through 265.1088 of this subpart, as applicable to the waste management unit.

(i) An initial determination of the average VO concentration of the waste stream shall be made before the first time any portion of the material in the hazardous waste stream is placed in a waste management unit exempted under the provisions of 265.1083(c)(1) of this subpart from using air emission controls, and thereafter an initial determination of the average VO concentration of the waste stream shall be made for each averaging period that a hazardous waste is managed in the unit; and

(ii) Perform a new waste determination whenever changes to the source generating the waste stream are reasonably likely to cause the average VO concentration of the hazardous waste to increase to a level that is equal to or greater than the VO concentration limit specified in 265.1083(c)(1) of this subpart.

(2) For a waste determination that is required by paragraph (a)(1) of this section, the average VO concentration of a hazardous waste at the point of waste origination shall be determined using either direct measurement as specified in paragraph (a)(3) of this section or by knowledge as specified in paragraph (a)(4) of this section.

(3) Direct measurement to determine average VO concentration of a hazardous waste at the point of waste origination.

(i) Identification. The owner or operator shall identify and record the point of waste origination for the hazardous waste.

(ii) Sampling. Samples of the hazardous waste stream shall be collected at the point of waste origination in a manner such that volatilization of organics contained in the waste and in the subsequent sample is minimized and an adequately representative sample is collected and maintained for analysis by the selected method.

(A) The averaging period to be used for determining the average VO concentration for the hazardous waste stream on a mass-weighted average basis shall be designated and recorded. The averaging period can represent any time interval that the owner or operator determines is appropriate for the hazardous waste stream but shall not exceed 1 year.

(B) A sufficient number of samples, but no less than four samples, shall be collected and analyzed for a hazardous waste determination. All of the samples for a given waste determination shall be collected within a one-hour period. The average of the four or more sample results constitutes a waste determination for the waste stream. One or more waste determinations may be required to represent the complete range of waste compositions and quantities that occur during the entire averaging period due to normal variations in the operating conditions for the source or process generating the hazardous waste stream. Examples of such normal variations are seasonal variations in waste quantity or fluctuations in ambient temperature.
(11/99)

(C) All samples shall be collected and handled in accordance with written procedures prepared by the owner or operator and documented in a site sampling plan. This plan shall describe the procedure by which representative samples of the hazardous waste stream are collected such that a minimum loss of organics occurs throughout the sample collection and

handling process, and by which sample integrity is maintained. A copy of the written sampling plan shall be maintained on-site in the facility operating records. An example of an acceptable sampling plan includes a plan incorporating sample collection and handling procedures in accordance with the requirements specified in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, (incorporated by reference—refer to 260.11(a) of this chapter), or in Method 25D in 40 CFR part 60, appendix A.

(D) Sufficient information, as specified in the “site sampling plan” required under paragraph (a)(3)(ii)(C) of this section, shall be prepared and recorded to document the waste quantity represented by the samples and, as applicable, the operating conditions for the source or process generating the hazardous waste represented by the samples.

(iii) Analysis. Each collected sample shall be prepared and analyzed in accordance with one or more of the methods listed in paragraphs (a)(3)(iii)(A) through (a)(3)(iii)(I) of this section, including appropriate quality assurance and quality control (QA/QC) checks and use of target compounds for calibration. If Method 25D in 40 CFR part 60, appendix A is not used, then one or more methods should be chosen that are appropriate to ensure that the waste determination accounts for and reflects all organic compounds in the waste with Henry’s law constant values at least 0.1 mole-fraction-in-the-gas-phase mole-fraction-in-the-liquid-phase (0.1 Y/X) [which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³] at 25 degrees Celsius. Each of the analytical methods listed in paragraphs (a)(3)(iii)(B) through (a)(3)(iii)(G) of this section has an associated list of approved chemical compounds, for which EPA considers the method appropriate for measurement. If an owner or operator uses EPA Method 624, 625, 1624, or 1625 in 40 CFR part 136, appendix A to analyze one or more compounds that are not on that method’s published list, the Alternative Test Procedure contained in 40 CFR 136.4 and 136.5 must be followed. If an owner or operator uses EPA Method 8260 or 8270 in “Test Methods for Evaluating Solid Waste, Physical Chemical Methods,” EPA Publication SW-846, (incorporated by reference - refer to 260.11(a) of this chapter) to analyze one or more compounds that are not on that method’s published list, the procedures in paragraph (a)(3)(iii)(H) of this section must be followed. At the owner or operator’s discretion, the owner or operator may adjust test data measured by a method other than Method 25D to the corresponding average VO concentration value which would have been obtained had the waste samples been analyzed using Method 25D in 40 CFR part 60, appendix A. To adjust these data, the measured concentration of each individual chemical constituent contained in the waste is multiplied by the appropriate constituent-specific adjustment factor (f_{m25D}). If the owner or operator elects to adjust test data, the adjustment must be made to all individual chemical constituents with a Henry’s law constant value greater than or equal to 0.1 Y/X at 25 degrees Celsius contained in the waste. Constituent-specific adjustment factors (f_{m25D}) can be obtained by contacting the Waste and Chemical Processes Group, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711.

(A) Method 25D in 40 CFR part 60, appendix A.

(B) Method 624 in 40 CFR part 136, appendix A.

(C) Method 625 in 40 CFR part 136, appendix A. Perform corrections to the compounds for which the analysis is being conducted based on the “accuracy as recovery” using the factors in Table 7 of the method.

(D) Method 1624 in 40 CFR part 136, appendix A.

(E) Method 1625 in 40 CFR part 136, appendix A.

(F) Method 8260 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.” EPA Publication SW-846 (incorporated by reference - refer to 260.11(a) of this chapter). Maintain a formal quality assurance program consistent with the requirements of Method 8260. The quality assurance program shall include the following elements:

(1) Documentation of site-specific procedures to minimize the loss of compounds due to volatilization, biodegradation, reaction, or sorption during the sample collection, storage, preparation, introduction, and analysis steps.

(2) Measurement of the overall accuracy and precision of the specific procedures.

(G) Method 8270 in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846 (incorporated by reference - refer to 260.11(a) of this chapter).

Maintain a formal quality assurance program consistent with the requirements of Method 8270. The quality assurance program shall include the following elements:

(1) Documentation of site-specific procedures to minimize the loss of compounds due to volatilization, biodegradation, reaction, or sorption during the sample collection, storage, preparation, introduction, and analysis steps.

(2) Measurement of the overall accuracy and precision of the specific procedures.

(H) Any other EPA standard method that has been validated in accordance with "Alternative Validation Procedure for EPA Waste and Wastewater Methods," 40 CFR part 63, appendix D. As an alternative, other EPA standard methods may be validated by the procedure specified in paragraph (a)(3)(iii)(I) of this section.

(I) Any other analysis method that has been validated in accordance with the procedures specified in Section 5.1 or Section 5.3, and the corresponding calculations in Section 6.1 or Section 6.3, of Method 301 in 40 CFR part 63, appendix A. The data are acceptable if they meet the criteria specified in Section 6.1.5 or Section 6.3.3 of Method 301. If correction is required under section 6.3.3 of Method 301, the data are acceptable if the correction factor is within the range 0.7 to 1.30. Other sections of Method 301 are not required.

(iv) Calculations.

(A) The average VO concentration (C) on a mass-weighted basis shall be calculated by using the results for all waste determinations conducted in accordance with paragraphs (a)(3) (ii) and (iii) of this section and the following equation:

$$\bar{C} = \frac{1}{Q_T} \times \sum_{i=1}^n (Q_i \times C_i)$$

Where:

\bar{C} = Average VO concentration of the hazardous waste at the point of waste origination on a mass-weighted basis, ppmw.

i = Individual waste determination "i" of the hazardous waste.

n = Total number of waste determinations of the hazardous waste conducted for the averaging period (not to exceed 1 year).

Q_i = Mass quantity of hazardous waste stream represented by C_i , kg/hr.

Q_T = Total mass quantity of hazardous waste during the averaging period, kg/hr.

C_i = Measured VO concentration of waste determination "i" as determined in accordance with the requirements of paragraph (a)(3)(iii) of this section (i.e. the average of the four or more samples specified in paragraph (a)(3)(ii)(B) of this section), ppmw.

(B) For the purpose of determining C_i , for individual waste samples analyzed in accordance with paragraph (a)(3)(iii) of this section, the owner or operator shall account for VO concentrations determined to be below the limit of detection of the analytical method by using the following VO concentration:

(1) If Method 25D in 40 CFR part 60, Appendix A is used for the analysis, one-half the blank value determined in the method at section 4.4 of Method 25D in 40 CFR part 60, appendix A.

(2) If any other analytical method is used, one-half the sum of the limits of detection established for each organic constituent in the waste that has a Henry's law constant values at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in-the-liquid-phase (0.1 Y/X) [which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³] at 25 degrees Celsius.

(v) Provided that the test method is appropriate for the waste as required under paragraph (a)(3)(iii) of this section, the Department will determine compliance based on the test method used by the owner or operator as recorded pursuant to 265.1090(f)(1) of this subpart.

(4) Use of owner or operator knowledge to determine average VO concentration of a hazardous waste at the point of waste origination.

(i) Documentation shall be prepared that presents the information used as the basis for the owner's or operator's knowledge of the hazardous waste stream's average VO concentration. Examples of information that may be used as the basis for knowledge include: Material balances for the source or process generating the hazardous waste stream; constituent-specific chemical test data for the hazardous waste stream from previous testing that are still applicable to the current waste stream; previous test data for other locations managing the same type of waste stream; or other knowledge based on information included in manifests, shipping papers, or waste certification notices.

(ii) If test data are used as the basis for knowledge, then the owner or operator shall document the test method, sampling protocol, and the means by which sampling variability and analytical variability are accounted for in the determination of the average VO concentration. For example, an owner or operator may use organic concentration test data for the hazardous waste stream that are validated in accordance with Method 301 in 40 CFR part 63, appendix A as the basis for knowledge of the waste.

(iii) An owner or operator using chemical constituent-specific concentration test data as the basis for knowledge of the hazardous waste may adjust the test data to the corresponding average VO concentration value which would have been obtained had the waste samples been analyzed using Method 25D in 40 CFR part 60, appendix A. To adjust these data, the measured concentration for each individual chemical constituent contained in the waste is multiplied by the appropriate constituent-specific adjustment factor (f_{m25D}).

(iv) In the event that the Department and the owner or operators disagree on a determination of the average VO concentration for a hazardous waste stream using knowledge, then the results from a determination of average VO concentration using direct measurement as specified in paragraph (a)(3) of this section shall be used to establish compliance with the applicable requirements of this subpart. The Department may perform or request that the owner or operator perform this determination using direct measurement. The owner or operator may choose one or more appropriate methods to analyze each collected sample in accordance with the requirements of paragraph (a)(3)(iii) of this section.

(b) Waste determination procedures for treated hazardous waste.

(1) An owner or operator shall perform the applicable waste determination for each treated hazardous waste placed in a waste management unit exempted under the provisions of 265.1083(c)(2)(i) through (c)(2)(vi) of this subpart from using air emission controls in accordance with standards specified in 265.1085 through 265.1088 of this subpart, as applicable to the waste management unit.

(i) An initial determination of the average VO concentration of the waste stream shall be made before the first time any portion of the material in the treated waste stream is placed in a waste management unit exempted under the provisions of 265.1083(c)(2), 265.1083(c)(3), or 265.1083(c)(4) of this subpart from using air emission controls, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(ii) Perform a new waste determination whenever changes to the process generating or treating the waste stream are reasonably likely to cause the average VO concentration of the hazardous waste to increase to a level such that the applicable treatment conditions specified in 265.1083(c)(2), 265.1083(c)(3), or 265.1083(c)(4) of this subpart are not achieved.

(2) The owner or operator shall designate and record the specific provision in 265.1083(c)(2) of this subpart under which the waste determination is being performed. The waste determination for the treated hazardous waste shall be performed using the applicable procedures specified in paragraphs (b)(3) through (b)(9) of this section.

(3) Procedure to determine the average VO concentration of a hazardous waste at the point of waste treatment.

(i) Identification. The owner or operator shall identify and record the point of waste treatment for the hazardous waste.

(ii) Sampling. Samples of the hazardous waste stream shall be collected at the point of waste treatment in a manner such that volatilization of organics contained in the waste and in the subsequent sample is minimized and an adequately representative sample is collected and maintained for analysis by the selected method.

(A) The averaging period to be used for determining the average VO concentration for the hazardous waste stream on a mass-weighted average basis shall be designated and recorded. The averaging period can represent any time interval that the owner or operator determines is appropriate for the hazardous waste stream but shall not exceed 1 year.

(B) A sufficient number of samples, but no less than four samples, shall be collected and analyzed for a hazardous waste determination. All of the samples for a given waste determination shall be collected within a one-hour period. The average of the four or more sample results constitutes a waste determination for the waste stream. One or more waste determinations may be required to represent the complete range of waste compositions and quantities that occur during the entire averaging period due to normal variations in the operating conditions for the process generating or treating the hazardous waste stream. Examples of such normal variations are seasonal variations in waste quantity or fluctuations in ambient temperature. (11/99)

(C) All samples shall be collected and handled in accordance with written procedures prepared by the owner or operator and documented in a site sampling plan. This plan shall describe the procedure by which representative samples of the hazardous waste stream are collected such that a minimum loss of organics occurs throughout the sample collection and handling process, and by which sample integrity is maintained. A copy of the written sampling plan shall be maintained on-site in the facility operating records. An example of an acceptable sampling plan includes a plan incorporating sample collection and handling procedures in accordance with the requirements specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846 (incorporated by reference—refer to 260.11(a) of this chapter), or in Method 25D in 40 CFR part 60, appendix A.

(D) Sufficient information, as specified in the "site sampling plan" required under paragraph (C) of (b)(3)(ii) this section, 265.1084(b)(3)(ii), shall be prepared and recorded to document the waste quantity represented by the samples and, as applicable, the operating conditions for the process treating the hazardous waste represented by the samples.

(iii) Analysis. Each collected sample shall be prepared and analyzed in accordance with one or more of the methods listed in paragraphs (b)(3)(iii)(A) through (b)(3)(iii)(I) of this section, including appropriate quality assurance and quality control (QA/QC) checks and use of target compounds for calibration. When the owner or operator is making a waste determination for a treated hazardous waste that is to be compared to an average VO concentration at the point of waste origination or the point of waste entry to the treatment system to determine if the conditions of 264.1082(c)(2)(i) through (c)(2)(vi) or 265.1083(c)(2)(i) through (c)(2)(vi) are met, then the waste samples shall be prepared and analyzed using the same method or methods as were used in making the initial waste determinations at the point of waste origination or at the point of entry to the treatment system. If Method 25D in 40 CFR part 60, appendix A is not used, then one or more methods should be chosen that are appropriate to ensure that the waste determination accounts for and reflects all organic compounds in the waste with Henry's law constant values at least 0.1 mole-fraction-in-the-gas-phase/mole-fraction-in-the-liquid-phase (0.1 Y/X) [which can also be expressed as 1.8×10^{-6} atmospheres/gram-mole/m³] at 25 degrees Celsius. Each of the analytical methods listed in paragraphs (b)(3)(iii)(B) through (b)(3)(iii)(G) of this section has an associated list of approved chemical compounds, for which EPA considers the method appropriate for measurement. If an owner or operator uses EPA Method 624, 625, 1624, or 1625 in 40 CFR part 136, appendix A to analyze one or more compounds that are not on that method's published list, the Alternative Test Procedure contained in 40 CFR 136.4 and 136.5 must be followed. If an owner or operator uses EPA Method 8260 or 8270 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, (incorporated by reference - refer to 260.11(a) of this chapter) to analyze one or more compounds that are not on that method's published list, the procedures in paragraph (b)(3)(iii)(H) of this section must be followed. At the owner or operator's discretion, the owner or operator may adjust test data measured by a method other than Method 25D to the corresponding average VO concentration value which would have

been obtained had the waste samples been analyzed using Method 25D in 40 CFR part 60, appendix A. To adjust these data, the measured concentration of each individual chemical constituent contained in the waste is multiplied by the appropriate constituent-specific adjustment factor (f_{m25D}). If the owner or operator elects to adjust test data, the adjustment must be made to all individual chemical constituents with a Henry's law constant equal to or greater than 0.1 Y/X at 25 degrees Celsius contained in the waste. Constituent-specific adjustment factors (f_{m25D}) can be obtained by contacting the Waste and Chemical Processes Group, Office of Air Quality Planning and Standards, Research Triangle Park, NC 27711.

(A) Method 25D in 40 CFR part 60, appendix A.

(B) Method 624 in 40 CFR part 136, appendix A.

(C) Method 625 in 40 CFR part 136, appendix A. Perform corrections to the compounds for which the analysis is being conducted based on the "accuracy as recovery" using the factors in Table 7 of the method.

(D) Method 1624 in 40 CFR part 136, appendix A.

(E) Method 1625 in 40 CFR part 136, appendix A.

(F) Method 8260 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846 (incorporated by reference - refer to 260.11(a) of this chapter). Maintain a formal quality assurance program consistent with the requirements of Method 8260. The quality assurance program shall include the following elements:

(G) Method 8270 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, (incorporated by reference - refer to 260.11(a) of this chapter). Maintain a formal quality assurance program consistent with the requirements of Method 8270. The quality assurance program shall include the following elements:

(H) Any other EPA standard method that has been validated in accordance with "Alternative Validation Procedure for EPA Waste and Wastewater Methods", 40 CFR part 63, appendix D. As an alternative, other EPA standard methods may be validated by the procedure specified in paragraph (b)(3)(iii)(I) of this section.

(I) Any other analysis method that has been validated in accordance with the procedures specified in Section 5.1 or Section 5.3, and the corresponding calculations in Section 6.1 or Section 6.3, of Method 301 in 40 CFR part 63, appendix A. The data are acceptable if they meet the criteria specified in Section 6.1.5 or Section 6.3.3 of Method 301. If correction is required under section 6.3.3 of Method 301, the data are acceptable if the correction factor is within the range 0.7 to 1.30. Other sections of Method 301 are not required.

(iv) Calculations. The average VO concentration (C) on a mass-weighted basis shall be calculated by using the results for all waste determinations conducted in accordance with paragraphs (b)(3)(ii) and (iii) of this section and the following equation:

where:

n = Total number of waste determinations of the hazardous waste conducted for the averaging period (not to exceed 1 year). (11/99)

$$\bar{C} = \frac{1}{Q_T} \times \sum_{i=1}^n (Q_i \times C_i)$$

Where:

\bar{C} = Average VO concentration of the hazardous waste at the point of waste treatment on a mass-weighted basis, ppmw.

i = Individual waste determination "i" of the hazardous waste.

n = Total number of waste determinations of the hazardous waste conducted for the averaging period (not to exceed 1 year).

Q_i = Mass quantity of hazardous waste stream represented by C_i , kg/hr.

Q_T = Total mass quantity of hazardous waste during the averaging period, kg/hr.

C_i = Measured VO concentration of waste determination "i" as determined in accordance with the requirements of paragraph (b)(3)(iii) of this section (i.e. the average of the four or more samples specified in paragraph (b)(3)(ii)(B) of this section), ppmw.

(v) Provided that the test method is appropriate for the waste as required under paragraph (b)(3)(iii) of this section, compliance shall be determined based on the test method used by the owner or operator as recorded pursuant to 265.1090(f)(1) of this subpart.

(4) Procedure to determine the exit concentration limit (C_t) for a treated hazardous waste.

(i) The point of waste origination for each hazardous waste treated by the process at the same time shall be identified.

(ii) If a single hazardous waste stream is identified in paragraph (b)(4)(i) of this section, then the exit concentration limit (C_t) shall be 500 ppmw.

(iii) If more than one hazardous waste stream is identified in paragraph (b)(4)(i) of this section, then the average VO concentration of each hazardous waste stream at the point of waste origination shall be determined in accordance with the requirements of paragraph (a) of this section. The exit concentration limit (C_t) shall be calculated by using the results determined for each individual hazardous waste stream and the following equation:

$$C_t = \frac{\sum_{x=1}^m (Q_x \times \bar{C}_x) + \sum_{y=1}^n (Q_y \times 500 \text{ ppmw})}{\sum_{x=1}^m Q_x + \sum_{y=1}^n Q_y}$$

Where:

C_t = Exit concentration limit for treated hazardous waste, ppmw.

x = Individual hazardous waste stream "x" that has an average VO concentration less than 500 ppmw at the point of waste origination as determined in accordance with the requirements of 265.1084(a) of this subpart.

y = Individual hazardous waste stream "y" that has an average VO concentration equal to or greater than 500 ppmw at the point of waste origination as determined in accordance with the requirements of 265.1084(a) of this subpart.

m = Total number of "x" hazardous waste streams treated by process.

n = Total number of "y" hazardous waste streams treated by process.

Q_x = Annual mass quantity of hazardous waste stream "x," kg/yr.

Q_y = Annual mass quantity of hazardous waste stream "y," kg/yr.

\bar{C}_x = Average VO concentration of hazardous waste stream "x" at the point of waste origination as determined in accordance with the requirements of 265.1084(a) of this subpart, ppmw.

(5) Procedure to determine the organic reduction efficiency (R) for a treated hazardous waste.

(i) The organic reduction efficiency (R) for a treatment process shall be determined based on results for a minimum of three consecutive runs.

(ii) All hazardous waste streams entering the treatment process and all hazardous waste streams exiting the treatment process shall be identified. The owner or operator shall prepare a sampling plan for measuring these streams that accurately reflects the retention time of the hazardous waste in the process.

(iii) For each run, information shall be determined for each hazardous waste stream identified in paragraph (b)(5)(ii) of this section using the following procedures:

(A) The mass quantity of each hazardous waste stream entering the process (Q_b) and the mass quantity of each hazardous waste stream exiting the process (Q_a) shall be determined.

(B) The average VO concentration at the point of waste origination of each hazardous waste stream entering the process (\bar{C}) during the run shall be determined in accordance with the requirements of paragraph (a)(3) of this section. The average VO concentration at the point of waste treatment of each waste stream exiting the process (\bar{C}) during the run shall be determined in accordance with the requirements of paragraph (b)(3) of this section.

(iv) The waste volatile organic mass flow entering the process (E_b) and the waste volatile organic mass flow exiting the process (E_a) shall be calculated by using the results determined in accordance with paragraph (b)(5)(iii) of this section and the following equations:

$$E_b = \frac{1}{10^6} \sum_{j=1}^m (Q_{bj} x \bar{C}_{bj})$$

$$E_a = \frac{1}{10^6} \sum_{j=1}^m (Q_{aj} x \bar{C}_{aj})$$

Where:

E_a = Waste volatile organic mass flow exiting process, kg/hr.

E_b = Waste volatile organic mass flow entering process, kg/hr.

m = Total number of runs (at least 3)

j = Individual run "j"

Q_b = Mass quantity of hazardous waste entering process during run "j," kg/hr.

Q_a = Average mass quantity of hazardous waste exiting process during run "j," kg/hr.

\bar{C}_a = Average VO concentration of hazardous waste exiting process during run "j" as determined in accordance with the requirements of 265.1084(b)(3) of this subpart, ppmw.

\bar{C}_b = Average VO concentration of hazardous waste entering process during run "j" as determined in accordance with the requirements of 265.1084(a)(3) of this subpart, ppmw.

(v) The organic reduction efficiency of the process shall be calculated by using the results determined in accordance with paragraph (b)(5)(iv) of this section and the following equation:

$$R = \frac{E_b - E_a}{E_b} \times 100\%$$

Where:

R = Organic reduction efficiency, percent.

E_b = Waste volatile organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(5)(iv) of this section, kg/hr.

E_a = Waste volatile organic mass flow exiting process as determined in accordance with the requirements of paragraph (b)(5)(iv) of this section, kg/hr.

(6) Procedure to determine the organic biodegradation efficiency (R_{bio}) for a treated hazardous waste.

(i) The fraction of organics biodegraded (F_{bio}) shall be determined using the procedure specified in 40 CFR part 63, appendix C of this chapter.

(ii) The R_{bio} shall be calculated by using the following equation:

$$R_{bio} = F_{bio} \times 100\%$$

Where:

R_{bio} = Organic biodegradation efficiency, percent.

F_{bio} = Fraction of organic biodegraded as determined in accordance with the requirements of paragraph (b)(6)(i) of this section.

(7) Procedure to determine the required organic mass removal rate (RMR) for a treated hazardous waste.

(i) All of the hazardous waste streams entering the treatment process shall be identified.

(ii) The average VO concentration of each hazardous waste stream at the point of waste origination shall be determined in accordance with the requirements of paragraph (a) of this section.

(iii) For each individual hazardous waste stream that has an average VO concentration equal to or greater than 500 ppmw at the point of waste origination, the average volumetric flow rate and the density of the hazardous waste stream at the point of waste origination shall be determined.

(iv) The RMR shall be calculated by using the average VO concentration, average volumetric flow rate, and density determined for each individual hazardous waste stream, and the following equation:

$$RMR = \sum_{y=1}^n \left[V_y \times k_y \times \frac{(\bar{C}_y - 500 \text{ ppmw})}{10^6} \right]$$

Where:

RMR = Required organic mass removal rate, kg/hr.

y = Individual hazardous waste stream "y" that has an average VO concentration equal to or greater than 500 ppmw at the point of waste origination as determined in accordance with the requirements of 265.1084(a) of this subpart.

n = Total number of "y" hazardous waste streams treated by process.

V_y = Average volumetric flow rate of hazardous waste stream "y" at the point of waste origination, m³/hr.

k_y = Density of hazardous waste stream "y," kg/m³

\bar{C}_y = Average VO concentration of hazardous waste stream "y" at the point of waste origination as determined in accordance with the requirements of 265.1084(a) of this subpart, ppmw.

(8) Procedure to determine the actual organic mass removal rate (MR) for a treated hazardous waste.

(i) The MR shall be determined based on results for a minimum of three consecutive runs. The sampling time for each run shall be 1 hour.

(ii) The waste volatile organic mass flow entering the process (E_b) and the waste volatile organic mass flow exiting the process (E_a) shall be determined in accordance with the requirements of paragraph (b)(5)(iv) of this section.

(iii) The MR shall be calculated by using the mass flow rate determined in accordance with the requirements of paragraph (b)(8)(ii) of this section and the following equation:

$$MR = E_b - E_a$$

Where:

MR = Actual organic mass removal rate, kg/hr.

E_b = Waste volatile organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(5)(iv) of this section, kg/hr.

E_a = Waste volatile organic mass flow exiting process as determined in accordance with the requirements of paragraph (b)(5)(iv) of this section, kg/hr.

(9) Procedure to determine the actual organic mass biodegradation rate (MR_{bio}) for a treated hazardous waste.

(i) The MR_{bio} shall be determined based on results for a minimum of three consecutive runs. The sampling time for each run shall be 1 hour.

(ii) The waste organic mass flow entering the process (E_b) shall be determined in accordance with the requirements of paragraph (b)(5)(iv) of this section.

(iii) The fraction of organic biodegraded (F_{bio}) shall be determined using the procedure specified in 40 CFR part 63, appendix C of this chapter.

(iv) The MR_{bio} shall be calculated by using the mass flow rates and fraction of organic biodegraded determined in accordance with the requirements of paragraphs (b)(9)(ii) and (b)(9)(iii) of this section, respectively, and the following equation:

$$MR_{bio} = E_b \times F_{bio}$$

Where:

MR_{bio} = Actual organic mass biodegradation rate, kg/hr.

E_b = Waste organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(5)(iv) of this section, kg/hr.

F_{bio} = Fraction of organic biodegraded as determined in accordance with the requirements of paragraph (b)(9)(iii) of this section.

(c) Procedure to determine the maximum organic vapor pressure of a hazardous waste in a tank.

(1) An owner or operator shall determine the maximum organic vapor pressure for each hazardous waste placed in a tank using Tank Level 1 controls in accordance with the standards specified in 265.1085(c) of this subpart.

(2) An owner or operator shall use either direct measurement as specified in paragraph (c)(3) of this section or knowledge of the waste as specified by paragraph (c)(4) of this section to determine the maximum organic vapor pressure which is representative of the hazardous waste composition stored or treated in the tank.

(3) Direct measurement to determine the maximum organic vapor pressure of a hazardous waste.

(i) Sampling. A sufficient number of samples shall be collected to be representative of the waste contained in the tank. All samples shall be collected and handled in accordance with written procedures prepared by the owner or operator and documented in a site sampling plan. This plan shall describe the procedure by which representative samples of the hazardous waste are collected such that a minimum loss of organics occurs throughout the sample collection and handling process and by which sample integrity is maintained. A copy of the written sampling plan shall be maintained on-site in the facility operating records. An example of an acceptable sampling plan includes a plan incorporating sample collection and handling procedures in accordance with the requirements specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, (incorporated by reference—refer to 260.11(a) of this chapter), or in Method 25D in 40 CFR part 60, appendix A.

(ii) Analysis. Any appropriate one of the following methods may be used to analyze the samples and compute the maximum organic vapor pressure of the hazardous waste:

(A) Method 25E in 40 CFR part 60 appendix A;

(B) Methods described in American Petroleum Institute Publication 2517, Third Edition, February 1989, "Evaporative Loss from External Floating-Roof Tanks," (incorporated by reference—refer to 260.11 of this chapter);

(C) Methods obtained from standard reference texts;

(D) ASTM Method 2879-92 (incorporated by reference—refer to 260.11 of this chapter); and

(E) Any other method approved by the Department.

(4) Use of knowledge to determine the maximum organic vapor pressure of the hazardous waste. Documentation shall be prepared and recorded that presents the information used as the basis for the owner's or operator's knowledge that the maximum organic vapor pressure of the hazardous waste is less than the maximum vapor pressure limit listed in 265.1085(b)(1)(i) of this subpart for the applicable tank design capacity category. An example of information that may be used is documentation that the hazardous waste is generated by a process for which at other locations it previously has been determined by direct measurement that the waste maximum organic vapor pressure is less than the maximum vapor pressure limit for the appropriate tank design capacity category.

(d) Procedure for determining no detectable organic emissions for the purpose of complying with this subpart:

(1) The test shall be conducted in accordance with the procedures specified in Method 21 of 40 CFR part 60, appendix A. Each potential leak interface (i.e., a location where organic vapor leakage could occur) on the cover and associated closure devices shall be checked. Potential leak interfaces that are associated with covers and closure devices include, but are not limited to: The interface of the cover and its foundation mounting; the periphery of any opening on the cover and its associated closure device; and the sealing seat interface on a spring-loaded pressure relief valve.

(2) The test shall be performed when the unit contains a hazardous waste having an organic concentration representative of the range of concentrations for the hazardous waste expected to be managed in the unit. During the test, the cover and closure devices shall be secured in the closed position.

(3) The detection instrument shall meet the performance criteria of Method 21 of 40 CFR part 60, appendix A, except the instrument response factor criteria in section 3.1.2(a) of Method 21 shall be for the average composition of the organic constituents in the hazardous waste placed in the waste management unit, not for each individual organic constituent.

(4) The detection instrument shall be calibrated before use on each day of its use by the procedures specified in Method 21 of 40 CFR part 60, appendix A.

(5) Calibration gases shall be as follows:

(i) Zero air (less than 10 ppmv hydrocarbon in air), and

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

(6) The background level shall be determined according to the procedures in Method 21 of 40 CFR part 60, appendix A.

(7) Each potential leak interface shall be checked by traversing the instrument probe around the potential leak interface as close to the interface as possible, as described in Method 21 of 40 CFR part 60, appendix A. In the case when the configuration of the cover or closure device prevents a complete traverse of the interface, all accessible portions of the interface shall be sampled. In the case when the configuration of the closure device prevents any sampling at the interface and the device is equipped with an enclosed extension or horn (e.g., some pressure relief devices), the instrument probe inlet shall be placed at approximately the center of the exhaust area to the atmosphere.

(8) The arithmetic difference between the maximum organic concentration indicated by the instrument and the background level shall be compared with the value of 500 ppmv except when monitoring a seal around a rotating shaft that passes through a cover opening, in which case the comparison shall be as specified in paragraph (d)(9) of this section. If the difference is less than 500 ppmv, then the potential leak interface is determined to operate with no detectable organic emissions.

(9) For the seals around a rotating shaft that passes through a cover opening, the arithmetic difference between the maximum organic concentration indicated by the instrument and the background level shall be compared with the value of 10,000 ppmw. If the difference is less than 10,000 ppmw, then the potential leak interface is determined to operate with no detectable organic emissions.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001.

265.1085. Standards: Tanks.

(a) The provisions of this section apply to the control of air pollutant emissions from tanks for which 265.1083(b) of this subpart references the use of this section for such air emission control.

(b) The owner or operator shall control air pollutant emissions from each tank subject to this section in accordance with the following requirements, as applicable:

(1) For a tank that manages hazardous waste that meets all of the conditions specified in paragraphs (b)(1)(i) through (b)(1)(iii) of this section, the owner or operator shall control air pollutant emissions from the tank in accordance with the Tank Level 1 controls specified in paragraph (c) of this section or the Tank Level 2 controls specified in paragraph (d) of this section.

(i) The hazardous waste in the tank has a maximum organic vapor pressure which is less than the maximum organic vapor pressure limit for the tank's design capacity category as follows:

(A) For a tank design capacity equal to or greater than 151 m³, the maximum organic vapor pressure limit for the tank is 5.2 kPa.

(B) For a tank design capacity equal to or greater than 75 m³ less than 151 m³, the maximum organic vapor pressure limit for the tank is 27.6 kPa.

(C) For a tank design capacity less than 75 m³, the maximum organic vapor pressure limit for the tank is 76.6 kPa.

(ii) The hazardous waste in the tank is not heated by the owner or operator to a temperature that is greater than the temperature at which the maximum organic vapor pressure of the hazardous waste is determined for the purpose of complying with paragraph (b)(1)(i) of this section.

(iii) The hazardous waste in the tank is not treated by the owner or operator using a waste stabilization process, as defined in 265.1081 of this subpart.

(2) For a tank that manages hazardous waste that does not meet all of the conditions specified in paragraphs (b)(1)(i) through (b)(1)(iii) of this section, the owner or operator shall control air pollutant emissions from the tank by using Tank Level 2 controls in accordance with the requirements of paragraph (d) of this section. Examples of tanks required to use Tank Level 2 controls include: A tank used for a waste stabilization process; and a tank for which the hazardous waste in the tank has a maximum organic vapor pressure that is equal to or greater than the maximum organic vapor pressure limit for the tank's design capacity category as specified in paragraph (b)(1)(i) of this section.

(c) Owners and operators controlling air pollutant emissions from a tank using Tank Level 1 controls shall meet the requirements specified in paragraphs (c)(1) through (c)(4) of this section:

(1) The owner or operator shall determine the maximum organic vapor pressure for a hazardous waste to be managed in the tank using Tank Level 1 controls before the first time the hazardous waste is placed in the tank. The maximum organic vapor pressure shall be determined using the procedures specified in 265.1084(c) of this subpart. Thereafter, the owner or operator shall perform a new determination whenever changes to the hazardous waste managed in the tank could potentially cause the maximum organic vapor pressure to increase to a level that is equal to or greater than the maximum organic vapor pressure limit for the tank design capacity category specified in paragraph (b)(1)(i) of this section, as applicable to the tank.

(2) The tank shall be equipped with a fixed roof designed to meet the following specifications:

(i) The fixed roof and its closure devices shall be designed to form a continuous barrier over the entire surface area of the hazardous waste in the tank. The fixed roof may be a separate cover

installed on the tank (e.g., a removable cover mounted on an open-top tank) or may be an integral part of the tank structural design (e.g., a horizontal cylindrical tank equipped with a hatch).

(ii) The fixed roof shall be installed in a manner such that there are no visible cracks, holes, gaps, or other open spaces between roof section joints or between the interface of the roof edge and the tank wall.

(iii) Each opening in the fixed roof, and any manifold system associated with the fixed roof, shall be either:

(A) Equipped with a closure device designed to operate such that when the closure device is secured in the closed position there are no visible cracks, holes, gaps, or other open spaces in the closure device or between the perimeter of the opening and the closure device; or

(B) Connected by a closed-vent system that is vented to a control device. The control device shall remove or destroy organics in the vent stream, and shall be operating whenever hazardous waste is managed in the tank, except as provided for in paragraphs (c)(2)(iii)(B)(1) and (2) of this section.

(1) During periods it is necessary to provide access to the tank for performing the activities of paragraph (c)(2)(iii)(B)(2) of this section, venting of the vapor headspace underneath the fixed roof to the control device is not required, opening of closure devices is allowed, and removal of the fixed roof is allowed. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable, and resume operation of the control device.

(2) During periods of routine inspection, maintenance, or other activities needed for normal operations, and for the removal of accumulated sludge or other residues from the bottom of the tank.

(iv) The fixed roof and its closure devices shall be made of suitable materials that will minimize exposure of the hazardous waste to the atmosphere, to the extent practical, and will maintain the integrity of the fixed roof and closure devices throughout their intended service life. Factors to be considered when selecting the materials for and designing the fixed roof and closure devices shall include: Organic vapor permeability, the effects of any contact with the hazardous waste or its vapors managed in the tank; the effects of outdoor exposure to wind, moisture, and sunlight; and the operating practices used for the tank on which the fixed roof is installed.

(3) Whenever a hazardous waste is in the tank, the fixed roof shall be installed with each closure device secured in the closed position except as follows:

(i) Opening of closure devices or removal of the fixed roof is allowed at the following times:

(A) To provide access to the tank for performing routine inspection, maintenance, or other activities needed for normal operations. Examples of such activities include those times when a worker needs to open a port to sample the liquid in the tank, or when a worker needs to open a hatch to maintain or repair equipment. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable, to the tank.

(B) To remove accumulated sludge or other residues from the bottom of tank.

(ii) Opening of a spring-loaded pressure-vacuum relief valve, conservation vent, or similar type of pressure relief device which vents to the atmosphere is allowed during normal operations for the purpose of maintaining the tank internal pressure in accordance with the tank design specifications. The device shall be designed to operate with no detectable organic emissions when the device is secured in the closed position. The settings at which the device opens shall be established such that the device remains in the closed position whenever the tank internal pressure is within the internal pressure operating range determined by the owner or operator based on the tank manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials. Examples of normal operating conditions that may require these devices to open are during those times when the tank internal pressure exceeds the internal pressure operating range for the tank as a result of loading operations or diurnal ambient temperature fluctuations.

(iii) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(4) The owner or operator shall inspect the air emission control equipment in accordance with the following requirements.

(i) The fixed roof and its closure devices 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 the roof sections or between the roof and the tank wall; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.

(ii) The owner or operator shall perform an initial inspection of the fixed roof and its closure devices on or before the date that the tank becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year except under the special conditions provided for in paragraph (l) of this section.

(iii) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (k) of this section.

(iv) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(b) of this subpart.

(d) Owners and operators controlling air pollutant emissions from a tank using Tank Level 2 controls shall use one of the following tanks:

(1) A fixed-roof tank equipped with an internal floating roof in accordance with the requirements specified in paragraph (e) of this section;

(2) A tank equipped with an external floating roof in accordance with the requirements specified in paragraph (f) of this section;

(3) A tank vented through a closed-vent system to a control device in accordance with the requirements specified in paragraph (g) of this section;

(4) A pressure tank designed and operated in accordance with the requirements specified in paragraph (h) of this section; or

(5) A tank located inside an enclosure that is vented through a closed-vent system to an enclosed combustion control device in accordance with the requirements specified in paragraph (i) of this section.

(e) The owner or operator who controls air pollutant emissions from a tank using a fixed-roof with an internal floating roof shall meet the requirements specified in paragraphs (e)(1) through (e)(3) of this section.

(1) The tank shall be equipped with a fixed roof and an internal floating roof in accordance with the following requirements:

(i) The internal floating roof shall be designed to float on the liquid surface except when the floating roof must be supported by the leg supports.

(ii) The internal floating roof shall be equipped with a continuous seal between the wall of the tank and the floating roof edge that meets either of the following requirements:

(A) A single continuous seal that is either a liquid-mounted seal or a metallic shoe seal, as defined in 265.1081 of this subpart; or

(B) Two continuous seals mounted one above the other. The lower seal may be a vapor-mounted seal.

(iii) The internal floating roof shall meet the following specifications:

(A) Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the liquid surface.

(B) Each opening in the internal floating roof shall be equipped with a gasketed cover or a gasketed lid except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains.

(C) Each penetration of the internal floating roof for the purpose of sampling shall have a slit fabric cover that covers at least 90 percent of the opening.

(D) Each automatic bleeder vent and rim space vent shall be gasketed.

(E) Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

(F) Each penetration of the internal floating roof that allows for passage of a column supporting the fixed roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

(2) The owner or operator shall operate the tank in accordance with the following requirements:

(i) When the floating roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be completed as soon as practical.

(ii) Automatic bleeder vents are to be set closed at all times when the roof is floating, except when the roof is being floated off or is being landed on the leg supports.

(iii) Prior to filling the tank, each cover, access hatch, gauge float well or lid on any opening in the internal floating roof shall be bolted or fastened closed (i.e., no visible gaps). Rim space vents are to be set to open only when the internal floating roof is not floating or when the pressure beneath the rim exceeds the manufacturer's recommended setting.

(3) The owner or operator shall inspect the internal floating roof in accordance with the procedures specified as follows:

(i) The floating roof and its closure devices 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: The internal floating roof is not floating on the surface of the liquid inside the tank; liquid has accumulated on top of the internal floating roof; any portion of the roof seals have detached from the roof rim; holes, tears, or other openings are visible in the seal fabric; the gaskets no longer close off the hazardous waste surface from the atmosphere; or the slotted membrane has more than 10 percent open area.

(ii) The owner or operator shall inspect the internal floating roof components as follows except as provided in paragraph (e)(3)(iii) of this section:

(A) Visually inspect the internal floating roof components through openings on the fixed-roof (e.g., manholes and roof hatches) at least once every 12 months after initial fill, and

(B) Visually inspect the internal floating roof, primary seal, secondary seal (if one is in service), gaskets, slotted membranes, and sleeve seals (if any) each time the tank is emptied and degassed and at least every 10 years.

(iii) As an alternative to performing the inspections specified in paragraph (e)(3)(ii) of this section for an internal floating roof equipped with two continuous seals mounted one above the other, the owner or operator may visually inspect the internal floating roof, primary and secondary seals, gaskets, slotted membranes, and sleeve seals (if any) each time the tank is emptied and degassed and at least every 5 years.

(iv) Prior to each inspection required by paragraph (e)(3)(ii) or (e)(3)(iii) of this section, the owner or operator shall notify the Department in advance of each inspection to provide the Department with the opportunity to have an observer present during the inspection. The owner or operator shall notify the Department of the date and location of the inspection as follows:

(A) Prior to each visual inspection of an internal floating roof in a tank that has been emptied and degassed, written notification shall be prepared and sent by the owner or operator so that it is received by the Department at least 30 calendar days before refilling the tank except when an inspection is not planned as provided for in paragraph (e)(3)(iv)(B) of this section.

(B) When a visual inspection is not planned and the owner or operator could not have known about the inspection 30 calendar days before refilling the tank, the owner or operator shall notify the Department as soon as possible, but no later than 7 calendar days before refilling of the tank. This notification may be made by telephone and immediately followed by a written explanation for why the inspection is unplanned. Alternatively, written notification, including the explanation for the unplanned inspection, may be sent so that it is received by the Department at least 7 calendar days before refilling the tank.

(v) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (k) of this section.

(vi) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(b) of this subpart.

(4) Safety devices, as defined in 265.1081 of this subpart, may be installed and operated as necessary on any tank complying with the requirements of paragraph (e) of this section.

(f) The owner or operator who controls air pollutant emissions from a tank using an external floating roof shall meet the requirements specified in paragraphs (f)(1) through (f)(3) of this section.

(1) The owner or operator shall design the external floating roof in accordance with the following requirements:

(i) The external floating roof shall be designed to float on the liquid surface except when the floating roof must be supported by the leg supports.

(ii) The floating roof shall be equipped with two continuous seals, one above the other, between the wall of the tank and the roof edge. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal.

(A) The primary seal shall be a liquid-mounted seal or a metallic shoe seal, as defined in 265.1081 of this subpart. The total area of the gaps between the tank wall and the primary seal shall not exceed 212 square centimeters (cm²) per meter of tank diameter, and the width of any portion of these gaps shall not exceed 3.8 centimeters (cm). If a metallic shoe seal is used for the primary seal, the metallic shoe seal shall be designed so that one end extends into the liquid in the tank and the other end extends a vertical distance of at least 61 centimeters above the liquid surface.

(B) The secondary seal shall be mounted above the primary seal and cover the annular space between the floating roof and the wall of the tank. The total area of the gaps between the tank wall and the secondary seal shall not exceed 21.2 square centimeters (cm²) per meter of tank diameter, and the width of any portion of these gaps shall not exceed 1.3 centimeters (cm).

(iii) The external floating roof shall meet the following specifications:

(A) Except for automatic bleeder vents (vacuum breaker vents) and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the liquid surface.

(B) Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof shall be equipped with a gasketed cover, seal, or lid.

(C) Each access hatch and each gauge float well shall be equipped with a cover designed to be bolted or fastened when the cover is secured in the closed position.

(D) Each automatic bleeder vent and each rim space vent shall be equipped with a gasket.

(E) Each roof drain that empties into the liquid managed in the tank shall be equipped with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

(F) Each unslotted and slotted guide pole well shall be equipped with a gasketed sliding cover or a flexible fabric sleeve seal.

(G) Each unslotted guide pole shall be equipped with a gasketed cap on the end of the pole.

(H) Each slotted guide pole shall be equipped with a gasketed float or other device which closes off the liquid surface from the atmosphere.

(I) Each gauge hatch and each sample well shall be equipped with a gasketed cover.

(2) The owner or operator shall operate the tank in accordance with the following requirements:

(i) When the floating roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be completed as soon as practical.

(ii) Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof shall be secured and maintained in a closed position at all times except when the closure device must be open for access.

(iii) Covers on each access hatch and each gauge float well shall be bolted or fastened when secured in the closed position.

(iv) Automatic bleeder vents shall be set closed at all times when the roof is floating, except when the roof is being floated off or is being landed on the leg supports.

(v) Rim space vents shall be set to open only at those times that the roof is being floated off the roof leg supports or when the pressure beneath the rim seal exceeds the manufacturer's recommended setting.

(vi) The cap on the end of each unslotted guide pole shall be secured in the closed position at all times except when measuring the level or collecting samples of the liquid in the tank.

(vii) The cover on each gauge hatch or sample well shall be secured in the closed position at all times except when the hatch or well must be opened for access.

(viii) Both the primary seal and the secondary seal shall completely cover the annular space between the external floating roof and the wall of the tank in a continuous fashion except during inspections.

(3) The owner or operator shall inspect the external floating roof in accordance with the procedures specified as follows:

(i) The owner or operator shall measure the external floating roof seal gaps in accordance with the following requirements:

(A) The owner or operator shall perform measurements of gaps between the tank wall and the primary seal within 60 calendar days after initial operation of the tank following installation of the floating roof and, thereafter, at least once every 5 years.

(B) The owner or operator shall perform measurements of gaps between the tank wall and the secondary seal within 60 calendar days after initial operation of the tank following installation of the floating roof and, thereafter, at least once every year.

(C) If a tank ceases to hold hazardous waste for a period of 1 year or more, subsequent introduction of hazardous waste into the tank shall be considered an initial operation for the purposes of paragraphs (f)(3)(i)(A) and (f)(3)(i)(B) of this section.

(D) The owner or operator shall determine the total surface area of gaps in the primary seal and in the secondary seal individually using the following procedure:

(1) The seal gap measurements shall be performed at one or more floating roof levels when the roof is floating off the roof supports.

(2) Seal gaps, if any, shall be measured around the entire perimeter of the floating roof in each place where a 0.32-centimeter (cm) diameter uniform probe passes freely (without forcing or binding against the seal) between the seal and the wall of the tank and measure the circumferential distance of each such location.

(3) For a seal gap measured under paragraph (f)(3) of this section, the gap surface area shall be determined by using probes of various widths to measure accurately the actual distance from the tank wall to the seal and multiplying each such width by its respective circumferential distance.

(4) The total gap area shall be calculated by adding the gap surface areas determined for each identified gap location for the primary seal and the secondary seal individually, and then dividing the sum for each seal type by the nominal diameter of the tank. These total gap areas for the primary seal and secondary seal are then compared to the respective standards for the seal type as specified in paragraph (f)(1)(ii) of this section.

(E) In the event that the seal gap measurements do not conform to the specifications in paragraph (f)(1)(ii) of this section, the owner or operator shall repair the defect in accordance with the requirements of paragraph (k) of this section.

(F) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(b) of this subpart.

(ii) The owner or operator shall visually inspect the external floating roof in accordance with the following requirements:

(A) The floating roof and its closure devices 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: Holes, tears, or other openings in the rim seal or seal fabric of the floating roof; a

rim seal detached from the floating roof; all or a portion of the floating roof deck being submerged below the surface of the liquid in the tank; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.

(B) The owner or operator shall perform an initial inspection of the external floating roof and its closure devices on or before the date that the tank becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year except for the special conditions provided for in paragraph (l) of this section.

(C) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (k) of this section.

(D) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(b) of this subpart.

(iii) Prior to each inspection required by paragraph (f)(3)(i) or (f)(3)(ii) of this section, the owner or operator shall notify the Department in advance of each inspection to provide the Department with the opportunity to have an observer present during the inspection. The owner or operator shall notify the Department of the date and location of the inspection as follows:

(A) Prior to each inspection to measure external floating roof seal gaps as required under paragraph (f)(3)(i) of this section, written notification shall be prepared and sent by the owner or operator so that it is received by the Department at least 30 calendar days before the date the measurements are scheduled to be performed.

(B) Prior to each visual inspection of an external floating roof in a tank that has been emptied and degassed, written notification shall be prepared and sent by the owner or operator so that it is received by the Department at least 30 calendar days before refilling the tank except when an inspection is not planned as provided for in paragraph (f)(3)(iii)(C) of this section.

(C) When a visual inspection is not planned and the owner or operator could not have known about the inspection 30 calendar days before refilling the tank, the owner or operator shall notify the Department as soon as possible, but no later than 7 calendar days before refilling of the tank. This notification may be made by telephone and immediately followed by a written explanation for why the inspection is unplanned. Alternatively, written notification, including the explanation for the unplanned inspection, may be sent so that it is received by the Department at least 7 calendar days before refilling the tank.

(4) Safety devices, as defined in 265.1081, may be installed and operated as necessary on any tank complying with the requirements of paragraph (f) of this section.

(g) The owner or operator who controls air pollutant emissions from a tank by venting the tank to a control device shall meet the requirements specified in paragraphs (g)(1) through (g)(3) of this section.

(1) The tank shall be covered by a fixed roof and vented directly through a closed-vent system to a control device in accordance with the following requirements:

(i) The fixed roof and its closure devices shall be designed to form a continuous barrier over the entire surface area of the liquid in the tank.

(ii) Each opening in the fixed roof not vented to the control device shall be equipped with a closure device. If the pressure in the vapor headspace underneath the fixed roof is less than atmospheric pressure when the control device is operating, the closure devices shall be designed to operate such that when the closure device is secured in the closed position there are no visible cracks, holes, gaps, or other open spaces in the closure device or between the perimeter of the cover opening and the closure device. If the pressure in the vapor headspace underneath the fixed roof is equal to or greater than atmospheric pressure when the control device is operating, the closure device shall be designed to operate with no detectable organic emissions.

(iii) The fixed roof and its closure devices shall be made of suitable materials that will minimize exposure of the hazardous waste to the atmosphere, to the extent practical, and will maintain the integrity of the fixed roof and closure devices throughout their intended service life. Factors to be considered when selecting the materials for and designing the fixed roof and closure devices shall include: Organic vapor permeability, the effects of any contact with the liquid and its vapor

managed in the tank; the effects of outdoor exposure to wind, moisture, and sunlight; and the operating practices used for the tank on which the fixed roof is installed.

(iv) The closed-vent system and control device shall be designed and operated in accordance with the requirements of 265.1088 of this subpart.

(2) Whenever a hazardous waste is in the tank, the fixed roof shall be installed with each closure device secured in the closed position and the vapor headspace underneath the fixed roof vented to the control device except as follows:

(i) Venting to the control device is not required, and opening of closure devices or removal of the fixed roof is allowed at the following times:

(A) To provide access to the tank for performing routine inspection, maintenance, or other activities needed for normal operations. Examples of such activities include those times when a worker needs to open a port to sample liquid in the tank, or when a worker needs to open a hatch to maintain or repair equipment. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable, to the tank.

(B) To remove accumulated sludge or other residues from the bottom of a tank.

(ii) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(3) The owner or operator shall inspect and monitor the air emission control equipment in accordance with the following procedures:

(i) The fixed roof and its closure devices 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 the roof sections or between the roof and the tank wall; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.

(ii) The closed-vent system and control device shall be inspected and monitored by the owner or operator in accordance with the procedures specified in 265.1088 of this subpart.

(iii) The owner or operator shall perform an initial inspection of the air emission control equipment on or before the date that the tank becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year except for the special conditions provided for in paragraph (l) of this section.

(iv) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (k) of this section.

(v) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(b) of this subpart.

(h) The owner or operator who controls air pollutant emissions by using a pressure tank shall meet the following requirements.

(1) The tank shall be designed not to vent to the atmosphere as a result of compression of the vapor headspace in the tank during filling of the tank to its design capacity.

(2) All tank openings shall be equipped with closure devices designed to operate with no detectable organic emissions as determined using the procedure specified in 265.1084(d) of this subpart.

(3) Whenever a hazardous waste is in the tank, the tank shall be operated as a closed system that does not vent to the atmosphere except under either of the following conditions as specified in paragraph (h)(3)(i) or (h)(3)(ii) of this section.

(i) At those times when opening of a safety device, as defined in 265.1081 of this subpart, is required to avoid an unsafe condition.

(ii) At those times when purging of inerts from the tank is required and the purge stream is routed to a closed-vent system and control device designed and operated in accordance with the requirements of 265.1088 of this subpart.

(i) The owner or operator who controls air pollutant emissions by using an enclosure vented through a closed-vent system to an enclosed combustion control device shall meet the requirements specified in paragraphs (i)(1) through (i)(4) of this section.

(1) The tank shall be located inside an enclosure. The enclosure shall be designed and operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, Appendix B. The enclosure may have permanent or temporary openings to allow worker access; passage of material into or out of the enclosure by conveyor, vehicles, or other mechanical means; entry of permanent mechanical or electrical equipment; or direct airflow into the enclosure. The owner or operator shall perform the verification procedure for the enclosure as specified in Section 5.0 to "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" initially when the enclosure is first installed and, thereafter, annually.

(2) The enclosure shall be vented through a closed-vent system to an enclosed combustion control device that is designed and operated in accordance with the standards for either a vapor incinerator, boiler, or process heater specified in 265.1088 of this subpart.

(3) Safety devices, as defined in 265.1081 of this subpart, may be installed and operated as necessary on any enclosure, closed-vent system, or control device used to comply with the requirements of paragraphs (i)(1) and (i)(2) of this section.

(4) The owner or operator shall inspect and monitor the closed-vent system and control device as specified in 265.1088 of this subpart.

(j) The owner or operator shall transfer hazardous waste to a tank subject to this section in accordance with the following requirements:

(1) Transfer of hazardous waste, except as provided in paragraph (j)(2) of this section, to the tank from another tank subject to this section or from a surface impoundment subject to 265.1086 of this subpart shall be conducted using continuous hard-piping or another closed system that does not allow exposure of the hazardous waste to the atmosphere. For the purpose of complying with this provision, an individual drain system is considered to be a closed system when it meets the requirements of 40 CFR part 63, subpart RR—National Emission Standards for Individual Drain Systems.

(2) The requirements of paragraph (j)(1) of this section do not apply when transferring a hazardous waste to the tank under any of the following conditions:

(i) The hazardous waste meets the average VO concentration conditions specified in 265.1083(c)(1) of this subpart at the point of waste origination.

(ii) The hazardous waste has been treated by an organic destruction or removal process to meet the requirements in 265.1083(c)(2) of this subpart.

(iii) The hazardous waste meets the requirements of 265.1083(c)(4) of this subpart.

(k) The owner or operator shall repair each defect detected during an inspection performed in accordance with the requirements of paragraphs (c)(4), (e)(3), (f)(3), or (g)(3) of this section as follows:

(1) The owner or operator shall make first efforts at repair of the defect no later than 5 calendar days after detection, and repair shall be completed as soon as possible but no later than 45 calendar days after detection except as provided in paragraph (k)(2) of this section.

(2) Repair of a defect may be delayed beyond 45 calendar days if the owner or operator determines that repair of the defect requires emptying or temporary removal from service of the tank and no alternative tank capacity is available at the site to accept the hazardous waste normally managed in the tank. In this case, the owner or operator shall repair the defect the next time the process or unit that is generating the hazardous waste managed in the tank stops operation. Repair of the defect shall be completed before the process or unit resumes operation.

(l) Following the initial inspection and monitoring of the cover as required by the applicable provisions of this subpart, subsequent inspection and monitoring may be performed at intervals longer than 1 year under the following special conditions:

(1) In the case when inspecting or monitoring the cover would expose a worker to dangerous, hazardous, or other unsafe conditions, then the owner or operator may designate a cover as an "unsafe to inspect and monitor cover" and comply with all of the following requirements:

(i) Prepare a written explanation for the cover stating the reasons why the cover is unsafe to visually inspect or to monitor, if required.

(ii) Develop and implement a written plan and schedule to inspect and monitor the cover, using the procedures specified in the applicable section of this subpart, as frequently as practicable during those times when a worker can safely access the cover.

(2) In the case when a tank is buried partially or entirely underground, an owner or operator is required to inspect and monitor, as required by the applicable provisions of this section, only those portions of the tank cover and those connections to the tank (e.g., fill ports, access hatches, gauge wells, etc.) that are located on or above the ground surface.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000.

265.1086. Standards: surface impoundments.

(a) The provisions of this section apply to the control of air pollutant emissions from surface impoundments for which 265.1083(b) of this subpart references the use of this section for such air emission control.

(b) The owner or operator shall control air pollutant emissions from the surface impoundment by installing and operating either of the following:

(1) A floating membrane cover in accordance with the provisions specified in paragraph (c) of this section; or

(2) A cover that is vented through a closed-vent system to a control device in accordance with the requirements specified in paragraph (d) of this section.

(c) The owner or operator who controls air pollutant emissions from a surface impoundment using a floating membrane cover shall meet the requirements specified in paragraphs (c)(1) through (c)(3) of this section.

(1) The surface impoundment shall be equipped with a floating membrane cover designed to meet the following specifications:

(i) The floating membrane cover shall be designed to float on the liquid surface during normal operations and form a continuous barrier over the entire surface area of the liquid.

(ii) The cover shall be fabricated from a synthetic membrane material that is either:

(A) High density polyethylene (HDPE) with a thickness no less than 2.5 millimeters (mm); or

(B) A material or a composite of different materials determined to have both organic permeability properties that are equivalent to those of the material listed in paragraph (c)(1)(ii)(A) of this section and chemical and physical properties that maintain the material integrity for the intended service life of the material.

(iii) The cover shall be installed in a manner such that there are no visible cracks, holes, gaps, or other open spaces between cover section seams or between the interface of the cover edge and its foundation mountings.

(iv) Except as provided for in paragraph (c)(1)(v) of this section, each opening in the floating membrane cover shall be equipped with a closure device designed to operate such that when the closure device is secured in the closed position there are no visible cracks, holes, gaps, or other open spaces in the closure device or between the perimeter of the cover opening and the closure device.

(v) The floating membrane cover may be equipped with one or more emergency cover drains for removal of stormwater. Each emergency cover drain shall be equipped with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening or a flexible fabric sleeve seal.

(vi) The closure devices shall be made of suitable materials that will minimize exposure of the hazardous waste to the atmosphere, to the extent practical, and will maintain the integrity of the closure devices throughout their intended service life. Factors to be considered when selecting the materials of construction and designing the cover and closure devices shall include: Organic vapor permeability; the effects of any contact with the liquid and its vapor managed in the surface

impoundment; the effects of outdoor exposure to wind, moisture, and sunlight; and the operating practices used for the surface impoundment on which the floating membrane cover is installed.

(2) Whenever a hazardous waste is in the surface impoundment, the floating membrane cover shall float on the liquid and each closure device shall be secured in the closed position except as follows:

(i) Opening of closure devices or removal of the cover is allowed at the following times:

(A) To provide access to the surface impoundment for performing routine inspection, maintenance, or other activities needed for normal operations. Examples of such activities include those times when a worker needs to open a port to sample the liquid in the surface impoundment, or when a worker needs to open a hatch to maintain or repair equipment. Following completion of the activity, the owner or operator shall promptly replace the cover and secure the closure device in the closed position, as applicable.

(B) To remove accumulated sludge or other residues from the bottom of surface impoundment.

(ii) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(3) The owner or operator shall inspect the floating membrane cover in accordance with the following procedures:

(i) The floating membrane cover and its closure devices 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 the cover section seams or between the interface of the cover edge and its foundation mountings; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.

(ii) The owner or operator shall perform an initial inspection of the floating membrane cover and its closure devices on or before the date that the surface impoundment becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year except for the special conditions provided for in paragraph (g) of this section.

(iii) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (f) of this section.

(iv) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(c) of this subpart.

(d) The owner or operator who controls air pollutant emissions from a surface impoundment using a cover vented to a control device shall meet the requirements specified in paragraphs (d)(1) through (d)(3) of this section.

(1) The surface impoundment shall be covered by a cover and vented directly through a closed-vent system to a control device in accordance with the following requirements:

(i) The cover and its closure devices shall be designed to form a continuous barrier over the entire surface area of the liquid in the surface impoundment.

(ii) Each opening in the cover not vented to the control device shall be equipped with a closure device. If the pressure in the vapor headspace underneath the cover is less than atmospheric pressure when the control device is operating, the closure devices shall be designed to operate such that when the closure device is secured in the closed position there are no visible cracks, holes, gaps, or other open spaces in the closure device or between the perimeter of the cover opening and the closure device. If the pressure in the vapor headspace underneath the cover is equal to or greater than atmospheric pressure when the control device is operating, the closure device shall be designed to operate with no detectable organic emissions using the procedure specified in 265.1084(d) of this subpart.

(iii) The cover and its closure devices shall be made of suitable materials that will minimize exposure of the hazardous waste to the atmosphere, to the extent practical, and will maintain the integrity of the cover and closure devices throughout their intended service life. Factors to be considered when selecting the materials of construction and designing the cover and closure devices shall include: Organic vapor permeability; the effects of any contact with the liquid or its

vapors managed in the surface impoundment; the effects of outdoor exposure to wind, moisture, and sunlight; and the operating practices used for the surface impoundment on which the cover is installed.

(iv) The closed-vent system and control device shall be designed and operated in accordance with the requirements of 265.1088 of this subpart.

(2) Whenever a hazardous waste is in the surface impoundment, the cover shall be installed with each closure device secured in the closed position and the vapor headspace underneath the cover vented to the control device except as follows:

(i) Venting to the control device is not required, and opening of closure devices or removal of the cover is allowed at the following times:

(A) To provide access to the surface impoundment for performing routine inspection, maintenance, or other activities needed for normal operations. Examples of such activities include those times when a worker needs to open a port to sample liquid in the surface impoundment, or when a worker needs to open a hatch to maintain or repair equipment. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable, to the surface impoundment.

(B) To remove accumulated sludge or other residues from the bottom of the surface impoundment.

(ii) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(3) The owner or operator shall inspect and monitor the air emission control equipment in accordance with the following procedures:

(i) The surface impoundment cover and its closure devices 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 the cover section seams or between the interface of the cover edge and its foundation mountings; broken, cracked, or otherwise damaged seals or gaskets on closure devices; and broken or missing hatches, access covers, caps, or other closure devices.

(ii) The closed-vent system and control device shall be inspected and monitored by the owner or operator in accordance with the procedures specified in 265.1088 of this subpart.

(iii) The owner or operator shall perform an initial inspection of the air emission control equipment on or before the date that the surface impoundment becomes subject to this section. Thereafter, the owner or operator shall perform the inspections at least once every year except for the special conditions provided for in paragraph (g) of this section.

(iv) In the event that a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (f) of this section.

(v) The owner or operator shall maintain a record of the inspection in accordance with the requirements specified in 265.1090(c) of this subpart.

(e) The owner or operator shall transfer hazardous waste to a surface impoundment subject to this section in accordance with the following requirements:

(1) Transfer of hazardous waste, except as provided in paragraph (e)(2) of this section, to the surface impoundment from another surface impoundment subject to this section or from a tank subject to 265.1085 of this subpart shall be conducted using continuous hard-piping or another closed system that does not allow exposure of the waste to the atmosphere. For the purpose of complying with this provision, an individual drain system is considered to be a closed system when it meets the requirements of 40 CFR part 63, subpart RR—National Emission Standards for Individual Drain Systems.

(2) The requirements of paragraph (e)(1) of this section do not apply when transferring a hazardous waste to the surface impoundment under either of the following conditions:

(i) The hazardous waste meets the average VO concentration conditions specified in 265.1083(c)(1) of this subpart at the point of waste origination.

(ii) The hazardous waste has been treated by an organic destruction or removal process to meet the requirements in 265.1083(c)(2) of this subpart.

(iii) The hazardous waste meets the requirements of 265.1083(c)(4) of this subpart.

(f) The owner or operator shall repair each defect detected during an inspection performed in accordance with the requirements of paragraph (c)(3) or (d)(3) of this section as follows:

(1) The owner or operator shall make first efforts at repair of the defect no later than 5 calendar days after detection, and repair shall be completed as soon as possible but no later than 45 calendar days after detection except as provided in paragraph (f)(2) of this section.

(2) Repair of a defect may be delayed beyond 45 calendar days if the owner or operator determines that repair of the defect requires emptying or temporary removal from service of the surface impoundment and no alternative capacity is available at the site to accept the hazardous waste normally managed in the surface impoundment. In this case, the owner or operator shall repair the defect the next time the process or unit that is generating the hazardous waste managed in the tank stops operation. Repair of the defect shall be completed before the process or unit resumes operation.

(g) Following the initial inspection and monitoring of the cover as required by the applicable provisions of this subpart, subsequent inspection and monitoring may be performed at intervals longer than 1 year in the case when inspecting or monitoring the cover would expose a worker to dangerous, hazardous, or other unsafe conditions. In this case, the owner or operator may designate the cover as an "unsafe to inspect and monitor cover" and comply with all of the following requirements:

(1) Prepare a written explanation for the cover stating the reasons why the cover is unsafe to visually inspect or to monitor, if required.

(2) Develop and implement a written plan and schedule to inspect and monitor the cover using the procedures specified in the applicable section of this subpart as frequently as practicable during those times when a worker can safely access the cover.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

265.1087. Standards: Containers.

(a) The provisions of this section apply to the control of air pollutant emissions from containers for which 265.1083(b) of this subpart references the use of this section for such air emission control.

(b) General requirements.

(1) The owner or operator shall control air pollutant emissions from each container subject to this section in accordance with the following requirements, as applicable to the container, except when the special provisions for waste stabilization processes specified in paragraph (b)(2) of this section apply to the container.

(i) For a container having a design capacity greater than 0.1 m³ and less than or equal to 0.46 m³, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section.

(ii) For a container having a design capacity greater than 0.46 m³ that is not in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 1 standards specified in paragraph (c) of this section.

(iii) For a container having a design capacity greater than 0.46 m³ that is in light material service, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 2 standards specified in paragraph (d) of this section.

(2) When a container having a design capacity greater than 0.1 m³ is used for treatment of a hazardous waste by a waste stabilization process, the owner or operator shall control air pollutant emissions from the container in accordance with the Container Level 3 standards specified in paragraph (e) of this section at those times during the waste stabilization process when the hazardous waste in the container is exposed to the atmosphere.

(c) Container Level 1 standards.

(1) A container using Container Level 1 controls is one of the following:

(i) A container that meets the applicable U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as specified in paragraph (f) of this section.

(ii) A container equipped with a cover and closure devices that form a continuous barrier over the container openings such that when the cover and closure devices are secured in the closed position there are no visible holes, gaps, or other open spaces into the interior of the container. The cover may be a separate cover installed on the container (e.g., a lid on a drum or a suitably secured tarp on a roll-off box) or may be an integral part of the container structural design (e.g., a “portable tank” or bulk cargo container equipped with a screw-type cap).

(iii) An open-top container in which an organic-vapor suppressing barrier is placed on or over the hazardous waste in the container such that no hazardous waste is exposed to the atmosphere. One example of such a barrier is application of a suitable organic-vapor suppressing foam.

(2) A container used to meet the requirements of paragraph (c)(1)(ii) or (c)(1)(iii) of this section shall be equipped with covers and closure devices, as applicable to the container, that are composed of suitable materials to minimize exposure of the hazardous waste to the atmosphere and to maintain the equipment integrity for as long as it is in service. Factors to be considered in selecting the materials of construction and designing the cover and closure devices shall include: Organic vapor permeability, the effects of contact with the hazardous waste or its vapor managed in the container; the effects of outdoor exposure of the closure device or cover material to wind, moisture, and sunlight; and the operating practices for which the container is intended to be used.

(3) Whenever a hazardous waste is in a container using Container Level 1 controls, the owner or operator shall install all covers and closure devices for the container, as applicable to the container, and secure and maintain each closure device in the closed position except as follows:

(i) Opening of a closure device or cover is allowed for the purpose of adding hazardous waste or other material to the container as follows:

(A) In the case when the container is filled to the intended final level in one continuous operation, the owner or operator shall promptly secure the closure devices in the closed position and install the covers, as applicable to the container, upon conclusion of the filling operation.

(B) In the case when discrete quantities or batches of material intermittently are added to the container over a period of time, the owner or operator shall promptly secure the closure devices in the closed position and install covers, as applicable to the container, upon either the container being filled to the intended final level; the completion of a batch loading after which no additional material will be added to the container within 15 minutes; the person performing the loading operation leaving the immediate vicinity of the container; or the shutdown of the process generating the material being added to the container, whichever condition occurs first.

(ii) Opening of a closure device or cover is allowed for the purpose of removing hazardous waste from the container as follows:

(A) For the purpose of meeting the requirements of this section, an empty container as defined in 261.7(b) may be open to the atmosphere at any time (i.e., covers and closure devices are not required to be secured in the closed position on an empty container).

(B) In the case when discrete quantities or batches of material are removed from the container but the container does not meet the conditions to be an empty container as defined in 261.7(b), the owner or operator shall promptly secure the closure devices in the closed position and install covers, as applicable to the container, upon the completion of a batch removal after which no additional material will be removed from the container within 15 minutes or the person performing the unloading operation leaves the immediate vicinity of the container, whichever condition occurs first.

(iii) Opening of a closure device or cover is allowed when access inside the container is needed to perform routine activities other than transfer of hazardous waste. Examples of such activities include those times when a worker needs to open a port to measure the depth of or sample the material in the container, or when a worker needs to open a manhole hatch to access equipment inside the container. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable to the container.

(iv) Opening of a spring-loaded, pressure-vacuum relief valve, conservation vent, or similar type of pressure relief device which vents to the atmosphere is allowed during normal operations for the purpose of maintaining the container internal pressure in accordance with the design specifications of the container. The device shall be designed to operate with no detectable organic emissions when the device is secured in the closed position. The settings at which the device opens shall be established such that the device remains in the closed position whenever the internal pressure of the container is within the internal pressure operating range determined by the owner or operator based on container manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials. Examples of normal operating conditions that may require these devices to open are during those times when the internal pressure of the container exceeds the internal pressure operating range for the container as a result of loading operations or diurnal ambient temperature fluctuations.

(v) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(4) The owner or operator of containers using Container Level 1 controls shall inspect the containers and their covers and closure devices as follows:

(i) In the case when a hazardous waste already is in the container at the time the owner or operator first accepts possession of the container at the facility and the container is not emptied within twenty-four (24) hours after the container is accepted at the facility (i.e., does not meet the conditions for an empty container as specified in section 261.7(b)), the owner or operator shall visually inspect the container and its cover and closure devices to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position. The container visual inspection shall be conducted on or before the date that the container is accepted at the facility (i.e., the date the container becomes subject to the subpart CC container standards). For purposes of this requirement, the date of acceptance is the date of signature that the facility owner or operator enters on Item 20 of the Uniform Hazardous Waste Manifest (EPA Forms 8700-22 and 8700-22A), as required under subpart E of this part, at section 265.71. If a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (c)(4)(iii) of this section.

(ii) In the case when a container used for managing hazardous waste remains at the facility for a period of 1 year or more, the owner or operator shall visually inspect the container and its cover and closure devices initially and thereafter, at least once every 12 months, to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position. If a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (c)(4)(iii) of this section.

(iii) When a defect is detected for the container, cover, or closure devices, the owner or operator shall make first efforts at repair of the defect no later than 24 hours after detection, and repair shall be completed as soon as possible but no later than 5 calendar days after detection. If repair of a defect cannot be completed within 5 calendar days, then the hazardous waste shall be removed from the container and the container shall not be used to manage hazardous waste until the defect is repaired.

(5) The owner or operator shall maintain at the facility a copy of the procedure used to determine that containers with capacity of 0.46 m³ or greater, which do not meet applicable DOT regulations as specified in paragraph (f) of this section, are not managing hazardous waste in light material service.

(d) Container Level 2 standards.

(1) A container using Container Level 2 controls is one of the following:

(i) A container that meets the applicable U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as specified in paragraph (f) of this section.

(ii) A container that operates with no detectable organic emissions as defined in 265.1081 of this subpart and determined in accordance with the procedure specified in paragraph (g) of this section.

(iii) A container that has been demonstrated within the preceding 12 months to be vapor-tight by using 40 CFR part 60, appendix A, Method 27 in accordance with the procedure specified in paragraph (h) of this section.

(2) Transfer of hazardous waste in or out of a container using Container Level 2 controls shall be conducted in such a manner as to minimize exposure of the hazardous waste to the atmosphere, to the extent practical, considering the physical properties of the hazardous waste and good engineering and safety practices for handling flammable, ignitable, explosive, reactive or other hazardous materials. Examples of container loading procedures that the EPA considers to meet the requirements of this paragraph include using any one of the following: A submerged-fill pipe or other submerged-fill method to load liquids into the container; a vapor-balancing system or a vapor-recovery system to collect and control the vapors displaced from the container during filling operations; or a fitted opening in the top of a container through which the hazardous waste is filled and subsequently purging the transfer line before removing it from the container opening.

(3) Whenever a hazardous waste is in a container using Container Level 2 controls, the owner or operator shall install all covers and closure devices for the container, and secure and maintain each closure device in the closed position except as follows:

(i) Opening of a closure device or cover is allowed for the purpose of adding hazardous waste or other material to the container as follows:

(A) In the case when the container is filled to the intended final level in one continuous operation, the owner or operator shall promptly secure the closure devices in the closed position and install the covers, as applicable to the container, upon conclusion of the filling operation.

(B) In the case when discrete quantities or batches of material intermittently are added to the container over a period of time, the owner or operator shall promptly secure the closure devices in the closed position and install covers, as applicable to the container, upon either the container being filled to the intended final level; the completion of a batch loading after which no additional material will be added to the container within 15 minutes; the person performing the loading operation leaving the immediate vicinity of the container; or the shutdown of the process generating the material being added to the container, whichever condition occurs first.

(ii) Opening of a closure device or cover is allowed for the purpose of removing hazardous waste from the container as follows:

(A) For the purpose of meeting the requirements of this section, an empty container as defined in 261.7(b) may be open to the atmosphere at any time (i.e., covers and closure devices are not required to be secured in the closed position on an empty container).

(B) In the case when discrete quantities or batches of material are removed from the container but the container does not meet the conditions to be an empty container as defined in 261.7(b), the owner or operator shall promptly secure the closure devices in the closed position and install covers, as applicable to the container, upon the completion of a batch removal after which no additional material will be removed from the container within 15 minutes or the person performing the unloading operation leaves the immediate vicinity of the container, whichever condition occurs first.

(iii) Opening of a closure device or cover is allowed when access inside the container is needed to perform routine activities other than transfer of hazardous waste. Examples of such activities include those times when a worker needs to open a port to measure the depth of or sample the material in the container, or when a worker needs to open a manhole hatch to access equipment inside the container. Following completion of the activity, the owner or operator shall promptly secure the closure device in the closed position or reinstall the cover, as applicable to the container.

(iv) Opening of a spring-loaded, pressure-vacuum relief valve, conservation vent, or similar type of pressure relief device which vents to the atmosphere is allowed during normal operations for the purpose of maintaining the internal pressure of the container in accordance with the container design specifications. The device shall be designed to operate with no detectable organic emission when the device is secured in the closed position. The settings at which the device opens shall be established such that the device remains in the closed position whenever the internal pressure of the container is within the internal pressure operating range determined by the owner or operator

based on container manufacturer recommendations, applicable regulations, fire protection and prevention codes, standard engineering codes and practices, or other requirements for the safe handling of flammable, ignitable, explosive, reactive, or hazardous materials. Examples of normal operating conditions that may require these devices to open are during those times when the internal pressure of the container exceeds the internal pressure operating range for the container as a result of loading operations or diurnal ambient temperature fluctuations.

(v) Opening of a safety device, as defined in 265.1081 of this subpart, is allowed at any time conditions require doing so to avoid an unsafe condition.

(4) The owner or operator of containers using Container Level 2 controls shall inspect the containers and their covers and closure devices as follows:

(i) In the case when a hazardous waste already is in the container at the time the owner or operator first accepts possession of the container at the facility and the container is not emptied within twenty-four (24) hours after the container is accepted at the facility (i.e., does not meet the conditions for an empty container as specified in section 261.7(b)), the owner or operator shall visually inspect the container and its cover and closure devices to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position. The container visual inspection shall be conducted on or before the date that the container is accepted at the facility (i.e., the date the container becomes subject to the subpart CC container standards). For purposes of this requirement, the date of acceptance is the date of signature that the facility owner or operator enters on Item 20 of the Uniform Hazardous Waste Manifest (EPA Forms 8700-22 and 8700-22A), as required under subpart E of this part, at section 265.71. If a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (d)(4)(iii) of this section.

(ii) In the case when a container used for managing hazardous waste remains at the facility for a period of 1 year or more, the owner or operator shall visually inspect the container and its cover and closure devices initially and thereafter, at least once every 12 months, to check for visible cracks, holes, gaps, or other open spaces into the interior of the container when the cover and closure devices are secured in the closed position. If a defect is detected, the owner or operator shall repair the defect in accordance with the requirements of paragraph (d)(4)(iii) of this section.

(iii) When a defect is detected for the container, cover, or closure devices, the owner or operator shall make first efforts at repair of the defect no later than 24 hours after detection, and repair shall be completed as soon as possible but no later than 5 calendar days after detection. If repair of a defect cannot be completed within 5 calendar days, then the hazardous waste shall be removed from the container and the container shall not be used to manage hazardous waste until the defect is repaired.

(e) Container Level 3 standards.

(1) A container using Container Level 3 controls is one of the following:

(i) A container that is vented directly through a closed-vent system to a control device in accordance with the requirements of paragraph (e)(2)(ii) of this section.

(ii) A container that is vented inside an enclosure which is exhausted through a closed-vent system to a control device in accordance with the requirements of paragraphs (e)(2)(i) and (e)(2)(ii) of this section.

(2) The owner or operator shall meet the following requirements, as applicable to the type of air emission control equipment selected by the owner or operator:

(i) The container enclosure shall be designed and operated in accordance with the criteria for a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, appendix B. The enclosure may have permanent or temporary openings to allow worker access; passage of containers through the enclosure by conveyor or other mechanical means; entry of permanent mechanical or electrical equipment; or direct airflow into the enclosure. The owner or operator shall perform the verification procedure for the enclosure as specified in Section 5.0 to "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" initially when the enclosure is first installed and, thereafter, annually.

(ii) The closed-vent system and control device shall be designed and operated in accordance with the requirements of 265.1088 of this subpart.

(3) Safety devices, as defined in 265.1081 of this subpart, may be installed and operated as necessary on any container, enclosure, closed-vent system, or control device used to comply with the requirements of paragraph (c)(1) of this section.

(4) Owners and operators using Container Level 3 controls in accordance with the provisions of this subpart shall inspect and monitor the closed-vent systems and control devices as specified in 265.1088 of this subpart.

(5) Owners and operators that use Container Level 3 controls in accordance with the provisions of this subpart shall prepare and maintain the records specified in 265.1090(d) of this subpart.

(6) Transfer of hazardous waste in or out of a container using Container Level 3 controls shall be conducted in such a manner as to minimize exposure of the hazardous waste to the atmosphere, to the extent practical, considering the physical properties of the hazardous waste and good engineering and safety practices for handling flammable, ignitable, explosive, reactive, or other hazardous materials. Examples of container loading procedures that the Department considers to meet the requirements of this paragraph include using any one of the following: A submerged-fill pipe or other submerged-fill method to load liquids into the container; a vapor-balancing system or a vapor-recovery system to collect and control the vapors displaced from the container during filling operations; or a fitted opening in the top of a container through which the hazardous waste is filled and subsequently purging the transfer line before removing it from the container opening.

(f) For the purpose of compliance with paragraph (c)(1)(i) or (d)(1)(i) of this section, containers shall be used that meet the applicable U.S. Department of Transportation (DOT) regulations on packaging hazardous materials for transportation as follows:

(1) The container meets the applicable requirements specified in 49 CFR part 178—Specifications for Packaging or 49 CFR part 179—Specifications for Tank Cars.

(2) Hazardous waste is managed in the container in accordance with the applicable requirements specified in 49 CFR part 107, subpart B—Exemptions; 49 CFR part 172—Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements; 49 CFR part 173—Shippers—General Requirements for Shipments and Packages; and 49 CFR part 180—Continuing Qualification and Maintenance of Packagings.

(3) For the purpose of complying with this subpart, no exceptions to the 49 CFR part 178 or part 179 regulations are allowed except as provided for in paragraph (f)(4) of this section.

(4) For a lab pack that is managed in accordance with the requirements of 49 CFR part 178 for the purpose of complying with this subpart, an owner or operator may comply with the exceptions for combination packagings specified in 49 CFR 173.12(b).

(g) To determine compliance with the no detectable organic emissions requirements of paragraph (d)(1)(ii) of this section, the procedure specified in 265.1084(d) of this subpart shall be used.

(h) Procedure for determining a container to be vapor-tight using Method 27 of 40 CFR part 60, appendix A for the purpose of complying with paragraph (d)(1)(iii) of this section.

(1) The test shall be performed in accordance with Method 27 of 40 CFR part 60, appendix A of this chapter.

(2) A pressure measurement device shall be used that has a precision of ± 2.5 mm water and that is capable of measuring above the pressure at which the container is to be tested for vapor tightness.

(3) If the test results determined by Method 27 indicate that the container sustains a pressure change less than or equal to 750 Pascals within 5 minutes after it is pressurized to a minimum of 4,500 Pascals, then the container is determined to be vapor-tight.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; SCSR 43–11 Doc. No. 4882, eff November 22, 2019.

265.1088. Standards: Closed-vent systems and control devices.

(a) This section applies to each closed-vent system and control device installed and operated by the owner or operator to control air emissions in accordance with standards of this subpart.

(b) The closed-vent system shall meet the following requirements:

(1) The closed-vent system shall route the gases, vapors, and fumes emitted from the hazardous waste in the waste management unit to a control device that meets the requirements specified in paragraph (c) of this section.

(2) The closed-vent system shall be designed and operated in accordance with the requirements specified in 265.1033(j) of this part.

(3) In the case when the closed-vent system includes bypass devices that could be used to divert the gas or vapor stream to the atmosphere before entering the control device, each bypass device shall be equipped with either a flow indicator as specified in paragraph (b)(3)(i) of this section or a seal or locking device as specified in paragraph (b)(3)(ii) of this section. For the purpose of complying with this paragraph, low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, spring-loaded pressure relief valves, and other fittings used for safety purposes are not considered to be bypass devices.

(i) If a flow indicator is used to comply with paragraph (b)(3) of this section, the indicator shall be installed at the inlet to the bypass line used to divert gases and vapors from the closed-vent system to the atmosphere at a point upstream of the control device inlet. For this paragraph, a flow indicator means a device which indicates the presence of either gas or vapor flow in the bypass line.

(ii) If a seal or locking device is used to comply with paragraph (b)(3) of this section, the device shall be placed on the mechanism by which the bypass device position is controlled (e.g., valve handle, damper lever) when the bypass device is in the closed position such that the bypass device cannot be opened without breaking the seal or removing the lock. Examples of such devices include, but are not limited to, a car-seal or a lock-and-key configuration valve. The owner or operator shall visually inspect the seal or closure mechanism at least once every month to verify that the bypass mechanism is maintained in the closed position.

(4) The closed-vent system shall be inspected and monitored by the owner or operator in accordance with the procedure specified in 265.1033(k).

(c) The control device shall meet the following requirements:

(1) The control device shall be one of the following devices:

(i) A control device designed and operated to reduce the total organic content of the inlet vapor stream vented to the control device by at least 95 percent by weight;

(ii) An enclosed combustion device designed and operated in accordance with the requirements of 265.1033(c); or

(iii) A flare designed and operated in accordance with the requirements of 265.1033(d).

(2) The owner or operator who elects to use a closed-vent system and control device to comply with the requirements of this section shall comply with the requirements specified in paragraphs (c)(2)(i) through (c)(2)(vi) of this section.

(i) Periods of planned routine maintenance of the control device, during which the control device does not meet the specifications of paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this section, as applicable, shall not exceed 240 hours per year.

(ii) The specifications and requirements in paragraphs (c)(1)(i), (c)(1)(ii), and (c)(1)(iii) of this section for control devices do not apply during periods of planned routine maintenance.

(iii) The specifications and requirements in paragraphs (c)(1)(i), (c)(1)(ii), and (c)(1)(iii) of this section for control devices do not apply during a control device system malfunction.

(iv) The owner or operator shall demonstrate compliance with the requirements of paragraph (c)(2)(i) of this section (i.e., planned routine maintenance of a control device, during which the control device does not meet the specifications of paragraphs (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this section, as applicable, shall not exceed 240 hours per year) by recording the information specified in 265.1090(e)(1)(v) of this subpart.

(v) The owner or operator shall correct control device system malfunctions as soon as practicable after their occurrence in order to minimize excess emissions of air pollutants.

(vi) The owner or operator shall operate the closed-vent system such that gases, vapors, and/or fumes are not actively vented to the control device during periods of planned maintenance or control device system malfunction (i.e., periods when the control device is not operating or not operating normally) except in cases when it is necessary to vent the gases, vapors, or fumes to avoid an unsafe condition or to implement malfunction corrective actions or planned maintenance actions.

(3) The owner or operator using a carbon adsorption system to comply with paragraph (c)(1) of this section shall operate and maintain the control device in accordance with the following requirements:

(i) Following the initial startup of the control device, all activated carbon in the control device shall be replaced with fresh carbon on a regular basis in accordance with the requirements of 265.1033(g) or 265.1033(h).

(ii) All carbon that is a hazardous waste and that is removed from the control device shall be managed in accordance with the requirements of 265.1033(m), regardless of the average volatile organic concentration of the carbon.

(4) An owner or operator using a control device other than a thermal vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with paragraph (c)(1) of this section shall operate and maintain the control device in accordance with the requirements of 265.1033(i).

(5) The owner or operator shall demonstrate that a control device achieves the performance requirements of paragraph (c)(1) of this section as follows:

(i) An owner or operator shall demonstrate using either a performance test as specified in paragraph (c)(5)(iii) of this section or a design analysis as specified in paragraph (c)(5)(iv) of this section the performance of each control device except for the following:

(A) A flare;

(B) A boiler or process heater with a design heat input capacity of 44 megawatts or greater;

(C) A boiler or process heater into which the vent stream is introduced with the primary fuel;

(D) A boiler or industrial furnace burning hazardous waste for which the owner or operator has been issued a final permit under part 270 and has designed and operates the unit in accordance with the requirements of part 266, subpart H; or

(E) A boiler or industrial furnace burning hazardous waste for which the owner or operator has designed and operates in accordance with the interim status requirements of part 266, subpart H.

(ii) An owner or operator shall demonstrate the performance of each flare in accordance with the requirements specified in 265.1033(e).

(iii) For a performance test conducted to meet the requirements of paragraph (c)(5)(i) of this section, the owner or operator shall use the test methods and procedures specified in 265.1034(c)(1) through (c)(4).

(iv) For a design analysis conducted to meet the requirements of paragraph (c)(5)(i) of this section, the design analysis shall meet the requirements specified in 265.1035(b)(4)(iii).

(v) The owner or operator shall demonstrate that a carbon adsorption system achieves the performance requirements of paragraph (c)(1) of this section based on the total quantity of organics vented to the atmosphere from all carbon adsorption system equipment that is used for organic adsorption, organic desorption or carbon regeneration, organic recovery, and carbon disposal.

(6) If the owner or operator and the Department do not agree on a demonstration of control device performance using a design analysis then the disagreement shall be resolved using the results of a performance test performed by the owner or operator in accordance with the requirements of paragraph (c)(5)(iii) of this section. The Department may choose to have an authorized representative observe the performance test.

(7) The closed-vent system and control device shall be inspected and monitored by the owner or operator in accordance with the procedures specified in 265.1033(f)(2) and 265.1033(k). The

readings from each monitoring device required by 265.1033(f)(2) shall be inspected at least once each operating day to check control device operation. Any necessary corrective measures shall be immediately implemented to ensure the control device is operated in compliance with the requirements of this section.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

265.1089. Inspection and monitoring requirements.

(a) The owner or operator shall inspect and monitor air emission control equipment used to comply with this subpart in accordance with the applicable requirements specified in 265.1085 through 265.1088 of this subpart.

(b) The owner or operator shall develop and implement a written plan and schedule to perform the inspections and monitoring required by paragraph (a) of this section. The owner or operator shall incorporate this plan and schedule into the facility inspection plan required under 265.15.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1090. Recordkeeping requirements.

(a) Each owner or operator of a facility subject to requirements in this subpart shall record and maintain the information specified in paragraphs (b) through (j) of this section, as applicable to the facility. Except for air emission control equipment design documentation and information required by paragraphs (i) and (j) of this section, records required by this section shall be maintained in the operating record for a minimum of 3 years. Air emission control equipment design documentation shall be maintained in the operating record until the air emission control equipment is replaced or otherwise no longer in service. Information required by paragraphs (i) and (j) of this section shall be maintained in the operating record for as long as the waste management unit is not using air emission controls specified in 265.1085 through 265.1088 of this subpart in accordance with the conditions specified in 265.1080(d) or 265.1080(b)(7), respectively.

(b) The owner or operator of a tank using air emission controls in accordance with the requirements of 265.1085 of this subpart shall prepare and maintain records for the tank that include the following information:

(1) For each tank using air emission controls in accordance with the requirements of 265.1085 of this subpart, the owner or operator shall record:

(i) A tank identification number (or other unique identification description as selected by the owner or operator).

(ii) A record for each inspection required by 265.1085 of this subpart that includes the following information:

(A) Date inspection was conducted.

(B) For each defect detected during the inspection. The location of the defect, a description of the defect, the date of detection, and corrective action taken to repair the defect. In the event that repair of the defect is delayed in accordance with the provisions of 265.1085 of this subpart, the owner or operator shall also record the reason for the delay and the date that completion of repair of the defect is expected.

(2) In addition to the information required by paragraph (b)(1) of this section, the owner or operator shall record the following information, as applicable to the tank:

(i) The owner or operator using a fixed roof to comply with the Tank Level 1 control requirements specified in 265.1085(c) of this subpart shall prepare and maintain records for each determination for the maximum organic vapor pressure of the hazardous waste in the tank performed in accordance with the requirements of 265.1085(c) of this subpart. The records shall include the date and time the samples were collected, the analysis method used, and the analysis results.

(ii) The owner or operator using an internal floating roof to comply with the Tank Level 2 control requirements specified in 265.1085(e) of this subpart shall prepare and maintain documentation describing the floating roof design.

(iii) Owners and operators using an external floating roof to comply with the Tank Level 2 control requirements specified in 265.1085(f) of this subpart shall prepare and maintain the following records:

(A) Documentation describing the floating roof design and the dimensions of the tank.

(B) Records for each seal gap inspection required by 265.1085(f)(3) of this subpart describing the results of the seal gap measurements. The records shall include the date that the measurements were performed, the raw data obtained for the measurements, and the calculations of the total gap surface area. In the event that the seal gap measurements do not conform to the specifications in 265.1085(f)(1) of this subpart, the records shall include a description of the repairs that were made, the date the repairs were made, and the date the tank was emptied, if necessary.

(iv) Each owner or operator using an enclosure to comply with the Tank Level 2 control requirements specified in 265.1085(i) of this subpart shall prepare and maintain the following records:

(A) Records for the most recent set of calculations and measurements performed by the owner or operator to verify that the enclosure meets the criteria of a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741 appendix B.

(B) Records required for the closed-vent system and control device in accordance with the requirements of paragraph (e) of this section.

(c) The owner or operator of a surface impoundment using air emission controls in accordance with the requirements of 265.1086 of this subpart shall prepare and maintain records for the surface impoundment that include the following information:

(1) A surface impoundment identification number (or other unique identification description as selected by the owner or operator).

(2) Documentation describing the floating membrane cover or cover design, as applicable to the surface impoundment, that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the specifications listed in 265.1086(c) of this subpart.

(3) A record for each inspection required by 265.1086 of this subpart that includes the following information:

(i) Date inspection was conducted.

(ii) For each defect detected during the inspection the following information: The location of the defect, a description of the defect, the date of detection, and corrective action taken to repair the defect. In the event that repair of the defect is delayed in accordance with the provisions of 265.1086(f) of this subpart, the owner or operator shall also record the reason for the delay and the date that completion of repair of the defect is expected.

(4) For a surface impoundment equipped with a cover and vented through a closed-vent system to a control device, the owner or operator shall prepare and maintain the records specified in paragraph (e) of this section.

(d) The owner or operator of containers using Container Level 3 air emission controls in accordance with the requirements of 265.1087 of this subpart shall prepare and maintain records that include the following information:

(1) Records for the most recent set of calculations and measurements performed by the owner or operator to verify that the enclosure meets the criteria of a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, appendix B.

(2) Records required for the closed-vent system and control device in accordance with the requirements of paragraph (e) of this section.

(e) The owner or operator using a closed-vent system and control device in accordance with the requirements of 265.1088 of this subpart shall prepare and maintain records that include the following information:

(1) Documentation for the closed-vent system and control device that includes:

(i) Certification that is signed and dated by the owner or operator stating that the control device is designed to operate at the performance level documented by a design analysis as specified in paragraph (e)(1)(ii) of this section or by performance tests as specified in paragraph (e)(1)(iii) of this section when the tank, surface impoundment, or container is or would be operating at capacity or the highest level reasonably expected to occur.

(ii) If a design analysis is used, then design documentation as specified in 265.1035(b)(4). The documentation shall include information prepared by the owner or operator or provided by the control device manufacturer or vendor that describes the control device design in accordance with 265.1035(b)(4)(iii) and certification by the owner or operator that the control equipment meets the applicable specifications.

(iii) If performance tests are used, then a performance test plan as specified in 265.1035(b)(3) and all test results.

(iv) Information as required by 265.1035(c)(1) and 265.1035(c)(2), as applicable.

(v) An owner or operator shall record, on a semiannual basis, the information specified in paragraphs (e)(1)(v)(A) and (e)(1)(v)(B) of this section for those planned routine maintenance operations that would require the control device not to meet the requirements of 265.1088 (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this subpart, as applicable.

(A) A description of the planned routine maintenance that is anticipated to be performed for the control device during the next 6-month period. This description shall include the type of maintenance necessary, planned frequency of maintenance, and lengths of maintenance periods.

(B) A description of the planned routine maintenance that was performed for the control device during the previous 6-month period. This description shall include the type of maintenance performed and the total number of hours during those 6 months that the control device did not meet the requirements of 265.1088 (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this subpart, as applicable, due to planned routine maintenance.

(vi) An owner or operator shall record the information specified in paragraphs (e)(1)(vi)(A) through (e)(1)(vi)(C) of this section for those unexpected control device system malfunctions that would require the control device not to meet the requirements of 265.1088 (c)(1)(i), (c)(1)(ii), or (c)(1)(iii) of this subpart, as applicable.

(A) The occurrence and duration of each malfunction of the control device system.

(B) The duration of each period during a malfunction when gases, vapors, or fumes are vented from the waste management unit through the closed-vent system to the control device while the control device is not properly functioning.

(C) Actions taken during periods of malfunction to restore a malfunctioning control device to its normal or usual manner of operation.

(vii) Records of the management of carbon removed from a carbon adsorption system conducted in accordance with 265.1088(c)(3)(ii) of this subpart.

(f) The owner or operator of a tank, surface impoundment, or container exempted from standards in accordance with the provisions of 265.1083(c) of this subpart shall prepare and maintain the following records, as applicable:

(1) For tanks, surface impoundments, or containers exempted under the hazardous waste organic concentration conditions specified in 265.1083(c)(1) or 265.1083(c)(2)(i) through (c)(2)(vi) of this subpart, the owner or operator shall record the information used for each waste determination (e.g., test results, measurements, calculations, and other documentation) in the facility operating log. If analysis results for waste samples are used for the waste determination, then the owner or operator shall record the date, time, and location that each waste sample is collected in accordance with applicable requirements of 265.1084 of this subpart.

(2) For tanks, surface impoundments, or containers exempted under the provisions of 265.1083(c)(2)(vii) or 265.1083(c)(2)(viii) of this subpart, the owner or operator shall record the identification number for the incinerator, boiler, or industrial furnace in which the hazardous waste is treated.

(g) An owner or operator designating a cover as “unsafe to inspect and monitor” pursuant to 265.1085(l) or 265.1086(g) of this subpart shall record in a log that is kept in the facility operating record the following information: The identification numbers for waste management units with covers that are designated as “unsafe to inspect and monitor,” the explanation for each cover stating why the cover is unsafe to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

(h) The owner or operator of a facility that is subject to this subpart and to the control device standards in 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to demonstrate compliance with the applicable sections of this subpart by documentation either pursuant to this subpart, or pursuant to the provisions of 40 CFR part 60, subpart VV or 40 CFR part 61, subpart V, to the extent that the documentation required by parts 60 or 61 duplicates the documentation required by this section.

(i) For each tank or container not using air emission controls specified in 265.1085 through 265.1088 of this subpart in accordance with the conditions specified in 265.1080(d) of this subpart, the owner or operator shall record and maintain the following information:

(1) A list of the individual organic peroxide compounds manufactured at the facility that meet the conditions specified in 265.1080(d)(1).

(2) A description of how the hazardous waste containing the organic peroxide compounds identified in paragraph (i)(1) of this section are managed at the facility in tanks and containers. This description shall include the following information:

(i) For the tanks used at the facility to manage this hazardous waste, sufficient information shall be provided to describe for each tank: A facility identification number for the tank; the purpose and placement of this tank in the management train of this hazardous waste; and the procedures used to ultimately dispose of the hazardous waste managed in the tanks.

(ii) For containers used at the facility to manage these hazardous wastes, sufficient information shall be provided to describe: A facility identification number for the container or group of containers; the purpose and placement of this container, or group of containers, in the management train of this hazardous waste; and the procedures used to ultimately dispose of the hazardous waste handled in the containers.

(3) An explanation of why managing the hazardous waste containing the organic peroxide compounds identified in paragraph (i)(1) of this section in the tanks and containers as described in paragraph (i)(2) of this section would create an undue safety hazard if the air emission controls, as required under 265.1085 through 265.1088 of this subpart, are installed and operated on these waste management units. This explanation shall include the following information:

(i) For tanks used at the facility to manage these hazardous wastes, sufficient information shall be provided to explain: How use of the required air emission controls on the tanks would affect the tank design features and facility operating procedures currently used to prevent an undue safety hazard during the management of this hazardous waste in the tanks; and why installation of safety devices on the required air emission controls, as allowed under this subpart, will not address those situations in which evacuation of tanks equipped with these air emission controls is necessary and consistent with good engineering and safety practices for handling organic peroxides.

(ii) For containers used at the facility to manage these hazardous wastes, sufficient information shall be provided to explain: How use of the required air emission controls on the containers would affect the container design features and handling procedures currently used to prevent an undue safety hazard during the management of this hazardous waste in the containers; and why installation of safety devices on the required air emission controls, as allowed under this subpart, will not address those situations in which evacuation of containers equipped with these air emission controls is necessary and consistent with good engineering and safety practices for handling organic peroxides.

(j) For each hazardous waste management unit not using air emission controls specified in 265.1085 through 265.1088 of this subpart in accordance with the provisions of 265.1080(b)(7) of this subpart, the owner and operator shall record and maintain the following information:

(1) Certification that the waste management unit is equipped with and operating air emission controls in accordance with the requirements of an applicable Clean Air Act regulation codified under 40 CFR part 60, part 61, or part 63.

(2) Identification of the specific requirements codified under 40 CFR part 60, part 61, or part 63 with which the waste management unit is in compliance.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998. Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001.

SUBPART DD
Containment Buildings

265.1100. Applicability.

The requirements of this subpart apply to owners or operators who store or treat hazardous waste in units designed and operated under 265.1101 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 units, 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 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 possible time, unless the unit has been granted a variance from the secondary containment system requirements under § 265.1101(b)(4);

(d) Has controls as needed to prevent fugitive dust emissions; and

(e) Is designed and operated to ensure containment and prevent the tracking of materials from the unit by personnel or equipment.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

265.1101. 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 and EPA 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.

(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 prevent 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 that protects human health and the environment.

(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 1×10^{-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 3×10^{-5} m²/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 overlaying 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 265.193(e)(1). In addition, the containment building must meet the requirements of 265.193 (b) and (c) to be considered an acceptable secondary containment system for a tank.)

(4) For existing units other than 90-day generator units, the Department may delay the secondary containment requirement for up to two years, based on a demonstration by the owner or operator that the unit substantially meets the standards of this Subpart. In making this demonstration, the owner or operator must:

(i) Provide written notice to the Department of their request by February 18, 1993. This notification must describe the unit and its operating practices with specific reference to the performance of existing containment systems, and specific plans for retrofitting the unit with secondary containment;

(ii) Respond to any comments from the Department on these plans within 30 days; and

(iii) Fulfill the terms of the revised plans, if such plans are approved by the Department.

(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. In addition, all associated particulate collection devices (e.g., fabric filter, electrostatic precipitator) must be operated and maintained with sound air pollution control practices. This state of no visible emissions must be maintained effectively at all times during normal operating conditions, including when vehicles and personnel are entering and exiting the unit.

(2) Obtain and keep on-site a certification by a qualified Professional Engineer that the containment building design meets the requirements of paragraphs (a), (b), and (c) of this section.

(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, the owner or operator 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 Department of the condition, and within 14 working days, provide a written notice to the Department with a description of the steps taken to repair the containment building, and the schedule for accomplishing the work.

(ii) The Department 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 Department 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 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 a containment building that contains both areas 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

(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 Department may waive requirements for secondary containment for a permitted containment building where the owner or 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.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012.

265.1102. 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 section 261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for containment buildings must meet all of the requirements specified in subparts G and H of this part.

(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 must close the facility and perform post-closure care in accordance with the closure and post-closure requirements that apply to landfills (265.310). 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 subparts G and H of this part.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART EE

Hazardous Waste Munitions and Explosives Storage

265.1200. Applicability.

The requirements of this subpart apply to owners or operators who store munitions and explosive hazardous wastes, except as 265.1 provides otherwise. (NOTE: Depending on explosive hazards, hazardous waste munitions and explosives may also be managed in other types of storage units, including containment buildings (part 265, subpart DD), tanks (part 265, subpart J), or containers (part 265, subpart I); See 266.205 for storage of waste military munitions).

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1201. Design and operating standards.

(a) Hazardous waste munitions and explosives storage units must be designed and operated with containment systems, controls, and monitoring, that:

(1) Minimize the potential for detonation or other means of release of hazardous waste, hazardous constituents, hazardous decomposition products, or contaminated runoff, to the soil, ground water, surface water, and atmosphere;

(2) Provide a primary barrier, which may be a container (including a shell) or tank, designed to contain the hazardous waste;

(3) For wastes stored outdoors, provide that the waste and containers will not be in standing precipitation;

(4) For liquid wastes, provide a secondary containment system that assures that any released liquids are contained and promptly detected and removed from the waste area, or vapor detection system that assures that any released liquids or vapors are promptly detected and an appropriate response taken (e.g., additional containment, such as overpacking, or removal from the waste area); and

(5) Provide monitoring and inspection procedures that assure the controls and containment systems are working as designed and that releases that may adversely impact human health or the environment are not escaping from the unit.

(b) Hazardous waste munitions and explosives stored under this subpart may be stored in one of the following:

(1) Earthcovered magazines. Earthcovered magazines must be:

(i) Constructed of waterproofed, reinforced concrete or structural steel arches, with steel doors that are kept closed when not being accessed;

(ii) Designed and constructed:

(A) To be of sufficient strength and thickness to support the weight of any explosives or munitions stored and any equipment used in the unit;

(B) To provide working space for personnel and equipment in the unit; and

(C) To withstand movement activities that occur in the unit; and

(iii) Located and designed, with walls and earthen covers that direct an explosion in the unit in a safe direction, so as to minimize the propagation of an explosion to adjacent units and to minimize other effects of any explosion.

(2) Aboveground magazines. Aboveground magazines must be located and designed so as to minimize the propagation of an explosion to adjacent units and to minimize other effects of any explosion.

(3) Outdoor or open storage areas. Outdoor or open storage areas must be located and designed so as to minimize the propagation of an explosion to adjacent units and to minimize other effects of any explosion.

(c) Hazardous waste munitions and explosives must be stored in accordance with a Standard Operating Procedure specifying procedures to ensure safety, security, and environmental protection. If these procedures serve the same purpose as the security and inspection requirements of 265.14, the preparedness and prevention procedures of part 265, subpart C, and the contingency plan and emergency procedures requirements of part 265, subpart D, then these procedures will be used to fulfill those requirements.

(d) Hazardous waste munitions and explosives must be packaged to ensure safety in handling and storage.

(e) Hazardous waste munitions and explosives must be inventoried at least annually.

(f) Hazardous waste munitions and explosives and their storage units must be inspected and monitored as necessary to ensure explosives safety and to ensure that there is no migration of contaminants out of the unit.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

265.1202. Closure and postclosure care.

(a) At closure of a magazine or unit which stored hazardous waste under this subpart, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components, contaminated subsoils, and structures and equipment contaminated with waste, and manage them as hazardous waste unless 261.3(d) of this chapter applies. The closure plan, closure activities, cost estimates for closure, and financial responsibility for magazines or units must meet all of the requirements specified in subparts G and H of this part, except that the owner or operator may defer closure of the unit as long as it remains in service as a munitions or explosives magazine or storage unit.

(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 or she must close the facility and perform postclosure care in accordance with the closure and postclosure requirements that apply to landfills (264.310).

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

APPENDIX I. Recordkeeping Instructions

The recordkeeping provisions of 265.73 specify that an owner or operator must keep a written operating record at his facility. This appendix provides additional instructions for keeping portions of the operating record. See 265.73(b) for additional recordkeeping requirements.

The following information must be recorded, as it becomes available, and maintained in the operating record until closure of the facility in the following manner:

Records of each hazardous waste received, treated, stored, or disposed of at the facility which include the following:

(1) A description by its common name and the EPA Hazardous Waste Number(s) from Part 261 of this chapter which apply to the waste. The waste description also must include the waste’s physical form, i.e., liquid, sludge, solid, or contained gas. If the waste is not listed in Part 261, Subpart D, of this chapter, the description also must include the process that produced it (for example, solid filter cake from production of _____, EPA Hazardous Waste Number W051).

Each hazardous waste listed in Part 261, Subpart D, of this chapter, and each hazardous waste characteristic defined in Part 261, Subpart C, of this chapter, has a four-digit EPA Hazardous Waste Number assigned to it. This number must be used for recordkeeping and reporting purposes. Where a hazardous waste contains more than one listed hazardous waste, or where more than one hazardous waste characteristic applies to the waste, the waste description must include all applicable EPA Hazardous Waste Numbers.

(2) The estimated or manifest-reported weight, or volume and density, where applicable, in one of the units of measure specified in Table 1:

(3) The methods (by handling code/s as specified in Table 2) and date(s) of treatment, storage or disposal.

Table 1

Unit of Measure	Code ¹
Gallons	G
Gallons per Hours	E
Gallons per Day	U
Liters	L
Liters per Hour	H
Liters per Day	V
Short Tons per Hour	D
Metric Tons per Hour	W
Short Tons per Day	N
Metric Tons per Day	S
Pounds per Hour	J
Kilograms per Hour	R
Cubic Yards	Y
Cubic Meters	C
Acres	B
Acre-feet	A
Hectares	Q
Hectare-meter	F
Btu’s per Hour	I

¹ Single digit symbols are used here for data processing purposes.

Table 2—Handling Codes for Treatment, Storage, and Disposal Methods

Enter the handling code(s) listed below that most closely represents the technique(s) used at the facility to treat, store or dispose of each quantity of hazardous waste received.

1. Storage

- S01 Container (barrel, drum, etc.)
- S02 Tank
- S03 Waste Pile
- S04 Surface impoundment
- S05 Drip Pad
- S06 Containment Building (Storage)
- S99 Other Storage (Specify)

2. Treatment

(a) Thermal Treatment—

- T06 Liquid injection incinerator
- T07 Rotary kiln incinerator
- T08 Fluidized bed incinerator
- T09 Multiple hearth incinerator
- T10 Infrared furnace incinerator
- T11 Molten salt destructor
- T12 Pyrolysis
- T13 Wet air oxidation
- T14 Calcination
- T15 Microwave discharge
- T18 Other (specify)

(b) Chemical Treatment—

- T19 Absorption mound
- T20 Absorption field
- T21 Chemical fixation
- T22 Chemical Oxidation
- T23 Chemical precipitation
- T24 Chemical reduction
- T25 Chlorination
- T26 Chlorinolysis
- T27 Cyanide destruction
- T28 Degradation
- T29 Detoxification
- T30 Ion exchange
- T31 Neutralization
- T32 Ozonation
- T33 Photolysis
- T34 Other (specify)

(c) Physical Treatment—

(1) Separation of components:

- T35 Centrifugation
- T36 Clarification
- T37 Coagulation
- T38 Decanting

- T39 Encapsulation
- T40 Filtration
- T41 Flocculation
- T42 Flotation
- T43 Foaming
- T44 Sedimentation
- T45 Thickening
- T46 Ultrafiltration
- T47 Other (specify)

(2) Removal of Specific Components:

- T48 Absorption-molecular sieve
- T49 Activated carbon
- T50 Blending
- T51 Catalysis
- T52 Crystallization
- T53 Dialysis
- T54 Distillation
- T55 Electrodialysis
- T56 Electrolysis
- T57 Evaporation
- T58 High gradient magnetic separation
- T59 Leaching
- T60 Liquid Ion exchange
- T61 Liquid-liquid extraction
- T62 Reverse osmosis
- T63 Solvent recovery
- T64 Stripping
- T65 Sand filter
- T66 Other (specify)

(d) Biological Treatment

- T67 Activated sludge
- T68 Aerobic lagoon
- T69 Aerobic tank
- T70 Anaerobic tank
- T71 Composting
- T72 Septic Tank
- T73 Spray irrigation
- T74 Thickening filter
- T75 Trickling filter
- T76 Waste stabilization pond
- T77 Other (specify)
- T78 [Reserved]
- T79 [Reserved]

(e) Boilers and Industrial Furnaces

- T80 Boiler
- T81 Cement Kiln
- T82 Lime Kiln
- T83 Aggregate Kiln
- T84 Phosphate Kiln
- T85 Coke Oven
- T86 Blast Furnace
- T87 Smelting, Melting, or Refining Furnace
- T88 Titanium Dioxide Chloride Process Oxidation Reactor
- T89 Methane Reforming Furnace
- T90 Pulping Liquor Recovery Furnace
- T91 Combustion Device Used in the Recovery of Sulfur Values from Spent Sulfuric Acid
- T92 Halogen Acid Furnaces
- T93 Other Industrial Furnaces Listed in 260.10 (specify)

(f) Other Treatment

- T94 Containment Building (Treatment)

3. Disposal

- D79 Underground injection
- D80 Landfill
- D81 Land Treatment
- D82 Ocean Disposal
- D83 Surface impoundment (to be closed as a landfill)
- D99 Other Disposal (specify)

4. Miscellaneous

- X01 Open Burning/Open Detonation
- X02 Mechanical Processing
- X03 Thermal Unit
- X04 Geologic Repository
- X99 Other (specify)

HISTORY: Amended by State Register Volume 16, Issue. No 12, eff December 25, 1992; State Register Volume 18, Issue No. 12, eff December 23, 1994.

APPENDIX III. EPA Interim Primary Drinking Water Standards

Parameter	Maximum level (mg/l)
Arsenic	0.05
Barium	1.0
Cadmium	0.01
Chromium	0.05
Fluoride	1.4-2.4
Lead	0.05
Mercury	0.002
Nitrate (as N)	10
Selenium	0.01
Silver	0.05
Endrin	0.0002
Lindane	0.004
Methoxychlor	0.1
Toxaphene	0.005

Parameter	Maximum level (mg/l)
2,4-D	0.1
2,4,5-TP Silver	0.01
Radium	5 pCi/l
Gross Alpha	15 pCi/l
Gross Beta	4 millirem/yr
Turbidity	1/TU
Coliform Bacteria	1/100 ml

[Comment: Turbidity is applicable only to surface water supplies.]

APPENDIX IV. Tests for Significance

As required in § 265.93(b) the owner or operator must use the Student's t-test to determine statistically significant changes in the concentration or value of an indicator parameter in periodic ground-water samples when compared to the initial background concentration or value of that indicator parameter. The comparison must consider individually each of the wells in the monitoring system. For three of the indicator parameters (specific conductance, total organic carbon, and total organic halogen) a single-tailed Student's t-test must be used to test at the 0.01 level of significance for significant increases over background. The difference test for pH must be a two-tailed Student's t-test at the overall 0.01 level of significance.

The student's t-test involves calculation of the value of a t-statistic for each comparison of the mean (average) concentration or value (based on a minimum of four replicate measurements) of an indicator parameter with its initial background concentration or value. The calculated value of the t-statistic must then be compared to the value of the t-statistic found in a table for t-test of significance at the specified level of significance. A calculated value of t which exceeds the value of t found in the table indicates a statistically significant change in the concentration or value of the indicator parameter.

Formulae for calculation of the t-statistic and tables for t-test of significance can be found in most introductory statistics texts.

APPENDIX V. Examples of Potentially Incompatible Waste

Many hazardous wastes, when mixed with other waste or materials at a hazardous waste facility, can produce effects which are harmful to human health and the environment, such as (1) heat or pressure, (2) fire or explosion, (3) violent reaction, (4) toxic dusts, mists, fumes, or gases, or (5) flammable fumes or gases.

Below are examples of potentially incompatible wastes, waste components, and materials, along with the harmful consequences which result from mixing materials in one group with materials in another group. The list is intended as a guide to owners or operators of treatment, storage, and disposal facilities, and to enforcement and permit granting officials, to indicate the need for special precautions when managing these potentially incompatible waste materials or components.

This list is not intended to be exhaustive. An owner or operator must, as the regulations require, adequately analyze his wastes so that he can avoid creating uncontrolled substances or reactions of the type listed below, whether they are listed below or not.

It is possible for potentially incompatible wastes to be mixed in a way that precludes a reaction (e.g., adding acid to water rather than water to acid) or that neutralizes them (e.g., a strong acid mixed with a strong base), or that controls substances produced (e.g., by generating flammable gases in a closed tank equipped so that ignition cannot occur, and burning the gases in an incinerator).

In the lists below, the mixing of a Group A material with a Group B material may have the potential consequence as noted.

Group 1-A	Group 1-B
Acetylene sludge	Acid sludge
Alkaline caustic liquids	Acid and water
Alkaline cleaner	Battery acid
Alkaline corrosive liquids	Chemical cleaners

Group 1-A	Group 1-B
Alkaline corrosive battery fluid	Electrolyte, acid
Caustic wastewater	Etching acid liquid or solvent
Lime sludge and other corrosive alkalis	Pickling liquor and other corrosive acids
Lime wastewater	Spent acid
Lime and water	Spent mixed acid
Spent caustic	Spent sulfuric acid

Potential consequences: Heat generation; violent reaction.

Group 2-A	Group 2-B
Aluminum	Any waste in Group 1-A or 1-B
Beryllium	
Calcium	
Lithium	
Magnesium	
Potassium	
Sodium	
Zinc powder	
Other reactive metals and metal hydrides	

Potential consequences: Fire or explosion; generation of flammable hydrogen gas.

Group 3-A	Group 3-B
Alcohols	Any concentrated waste in Groups 1-A or 1-B
Water	Calcium
	Lithium
	Metal hydrides
	Potassium
	SO ₂ Cl ₂ SOCl ₂ PCl ₃
	CH ₃ SiCl ₃
	Other water-reactive waste

Potential consequences: Fire, explosion, or heat generation; generation of flammable or toxic gases.

APPENDIX VI. Compounds With Henry's Law Constant Less Than 0.1 Y/X

COMPOUND NAME	CAS NO.
Acetaldol	107-89-1
Acetamide	60-35-5
2-Acetylaminofluorene	53-96-3
3-Acetyl-5-hydroxypiperidine	
3-Acetylpiperidine	618-42-8
1-Acetyl-2-thiourea	591-08-2
Acrylamide	79-06-1
Acrylic acid	79-10-7
Adenine	73-24-5
Adipic acid	124-04-9
Adiponitrile	111-69-3
Alachlor	15972-60-8
Aldicarb	116-06-3
Ametryn	834-12-8
4-Aminobiphenyl	92-67-1
4-Aminopyridine	504-24-5
Aniline	62-53-3
o-Anisidine	90-04-0
Anthraquinone	84-65-1

COMPOUND NAME	CAS NO.
Atrazine	1912-24-9
Benzeneearsonic acid	98-05-5
Benzenesulfonic acid	98-11-3
Benzidine	92-87-5
Benzo(a)anthracene	56-55-3
Benzo(k)fluoranthene	207-08-9
Benzoic acid	65-85-0
Benzo(g,h,i)perylene	191-24-2
Benzo(a)pyrene	50-32-8
Benzyl alcohol	100-51-6
gamma-BHC	58-89-9
Bis(2-ethylhexyl)phthalate	117-81-7
Bromochloromethyl acetate	
Bromoxynil	1689-84-5
Butyric acid	107-92-6
Caprolactam (hexahydro-2H-azepin-2-one)	105-60-2
Catechol (o-dihydroxybenzene)	120-80-9
Cellulose	9004-34-6
Cell wall	
Chlorhydrin (3-Chloro-1,2-propanediol)	96-24-2
Chloroacetic acid	79-11-8
2-Chloroacetophenone	93-76-5
p-Chloroaniline	106-47-8
p-Chlorobenzophenone	134-85-0
Chlorobenzilate	510-15-6
p-Chloro-m-cresol (6-chloro-m-cresol)	59-50-7
3-Chloro-2,5-diketopyrrolidine	
Chloro-1,2-ethane diol	
4-Chlorophenol	106-48-9
Chlorophenol polymers (2-chlorophenol & 4-chlorophenol)	95-57-8 & 106-48-9
1-(o-Chlorophenyl)thiourea	5344-82-1
Chrysene	218-01-9
Citric acid	77-92-9
Creosote	8001-58-9
m-Cresol	108-39-4
o-Cresol	95-48-7
p-Cresol	106-44-5
Cresol (mixed isomers)	1319-77-3
4-Cumylphenol	27576-86
Cyanide	57-12-5
4-Cyanomethyl benzoate	
Diazinon	333-41-5
Dibenzo(a,h)anthracene	53-70-3
Dibutylphthalate	84-74-2
2,5-Dichloroaniline (N,N'-dichloroaniline)	95-82-9
2,6-Dichlorobenzonitrile 11	1194-65-6
2,6-Dichloro-4-nitroaniline	99-30-9
2,5-Dichlorophenol	333-41-5
3,4-Dichlorotetrahydrofuran	3511-19
Dichlorvos (DDVP)	62-73-7
Diethanolamine	111-42-2
N,N-Diethylaniline	91-66-7
Diethylene glycol	111-46-6
Diethylene glycol dimethyl ether (dimethyl Carbitol)	111-96-6
Diethylene glycol monobutyl ether (butyl Carbitol)	112-34-5
Diethylene glycol monoethyl ether acetate (Carbitol acetate)	112-15-2
Diethylene glycol monoethyl ether (Carbitol Cellosolve)	111-90-0
Diethylene glycol monoethyl ether (methyl Carbitol)	111-77-3
N,N'-Diethylhydrazine	1615-80-1
Diethyl (4-methylumbelliferyl) thionophosphate	299-45-6
Diethyl phosphorothioate	126-75-0
N,N'-Diethylpropionamide	15299-99-7

COMPOUND NAME	CAS NO.
Dimethoate	60-51-5
2,3-Dimethoxystrychnidin-10-one	357-57-3
4-Dimethylaminoazobenzene	60-11-7
7,12-Dimethylbenz(a)anthracene	57-97-6
3,3-Dimethylbenzidine	119-93-7
Dimethylcarbamoyl chloride	79-44-7
Dimethyldisulfide	624-92-0
Dimethylformamide	68-12-2
1,1-Dimethylhydrazine	57-14-7
Dimethylphthalate	131-11-3
Dimethylsulfone	67-71-0
Dimethylsulfoxide	67-68-5
4,6-Dinitro-o-cresol	534-52-1
1,2-Diphenylhydrazine	122-66-7
Dipropylene glycol (1,1'-oxydi-2-propanol)	110-98-5
Endrin	72-20-8
Epinephrine	51-43-4
mono-Ethanolamine	141-43-5
Ethyl carbamate (urethane)	5-17-96
Ethylene glycol	107-21-1
Ethylene glycol monobutyl ether (butyl Cellosolve)	111-76-2
Ethylene glycol monoethyl ether (Cellosolve)	110-80-5
Ethylene glycol monoethyl ether acetate (Cellosolve acetate)	111-15-9
Ethylene glycol monomethyl ether (methyl Cellosolve)	109-86-4
Ethylene glycol monophenyl ether (phenyl Cellosolve)	122-99-6
Ethylene glycol monopropyl ether (propyl Cellosolve)	2807-30-9
Ethylene thiourea (2-imidazolidinethione)	96-45-7
4-Ethylmorpholine	100-74-3
3-Ethylphenol	620-17-7
Fluoroacetic acid, sodium salt	62-74-8
Formaldehyde	50-00-0
Formamide	75-12-7
Formic acid	64-18-6
Fumaric acid	110-17-8
Glutaric acid	110-94-1
Glycerin (Glycerol)	56-81-5
Glycidol	556-52-5
Glycinamide	598-41-4
Glyphosate	1071-83-6
Guthion	86-50-0
Hexamethylene-1, 6-diisocyanate (1,6-diisocyanatohexane)	822-06-0
Hexamethyl phosphoramidate	680-31-9
Hexanoic acid	142-62-1
Hydrazine	302-01-2
Hydrocyanic acid	74-90-8
Hydroquinone	123-31-9
Hydroxy-2-propionitrile (hydracrylonitrile)	109-78-4
Indeno (1,2,3-cd) pyrene	193-39-5
Lead acetate	301-04-2
Lead subacetate (lead acetate, monobasic)	1335-32-6
Leucine	61-90-5
Malathion	121-75-5
Maleic acid	110-16-7
Maleic anhydride	108-31-6
Mesityl oxide	141-79-7
Methane sulfonic acid	75-75-2
Methomyl	16752-77-5
p-Methoxyphenol	150-76-5
Methyl acrylate	96-33-3
4,4'-Methylene-bis-(2-chloroaniline)	101-14-4
4,4'-Methylenediphenyl diisocyanate (diphenyl methane diisocyanate)	101-68-8
4,4'-Methylenedianiline	101-77-9
Methylene diphenylamine (MDA)	

COMPOUND NAME	CAS NO.
5-Methylfurfural	620-02-0
Methylhydrazine	60-34-4
Methyliminoacetic acid	
Methyl methane sulfonate	66-27-3
1-Methyl-2-methoxyaziridine	
Methylparathion	298-00-0
Methyl sulfuric acid (sulfuric acid, dimethyl ester)	77-78-1
4-Methylthiophenol	106-45-6
Monomethylformamide (N-methylformamide)	123-39-7
Nabam	142-59-6
alpha-Naphthol	90-15-3
beta-Naphthol	135-19-3
alpha-Naphthylamine	134-32-7
beta-Naphthylamine	91-59-8
Neopentyl glycol (dimethylpropane)	126-30-7
Niacinamide	98-92-0
o-Nitroaniline	88-74-4
Nitroglycerin	55-63-0
2-Nitrophenol	88-75-5
4-Nitrophenol	100-02-7
N-Nitrosodimethylamine	62-75-9
Nitrosoguanidine	674-81-7
N-Nitroso-n-methylurea	684-93-5
N-Nitrosomorpholine (4-nitrosomorpholine)	59-89-2
Oxalic acid	144-62-7
Parathion	56-38-2
Pentaerythritol	115-77-5
Phenacetin	62-44-2
Phenol	108-95-2
Phenylacetic acid	103-82-2
m-Phenylene diamine	108-45-2
o-Phenylene diamine	95-54-5
p-Phenylene diamine	106-50-3
Phenyl mercuric acetate	62-38-4
Phorate	298-02-2
Phthalic anhydride	85-44-9
alpha-Picoline (2-methyl pyridine)	109-06-8
1,3-Propane sultone	1120-71-4
beta-Propiolactone	57-57-8
Proporur (Baygon)	
Propylene glycol	57-55-6
Pyrene	129-00-0
Pyridinium bromide	39416-48-3
Quinoline	91-22-5
Quinone (p-benzoquinone)	106-51-4
Resorcinol	108-46-3
Simazine	122-34-9
Sodium acetate	127-09-3
Sodium formate	141-53-7
Strychnine	57-24-9
Succinic acid	110-15-6
Succinimide	123-56-8
Sulfanilic acid	121-47-1
Terephthalic acid	100-21-0
Tetraethyldithiopyrophosphate	3689-24-5
Tetraethylenepentamine	112-57-2
Thiofanox	39196-18-4
Thiosemicarbazide	79-19-6
2,4-Toluenediamine	95-80-7
2,6-Toluenediamine	823-40-5
3,4-Toluenediamine	496-72-0
2,4-Toluene diisocyanate	584-84-9
p-Toluic acid	99-94-5

COMPOUND NAME	CAS NO.
m-Toluidine	108-44-1
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1
Triethanolamine	102-71-6
Triethylene glycol dimethyl ether	
Tripropylene glycol	24800-44-0
Warfarin	81-81-2
3,4-Xylenol (3,4-dimethylphenol)	95-65-8

HISTORY: Amended by State Register Volume 23, Issue No. 11, eff November 26, 1999.

SUBPART FF

Fees for the Electronic Hazardous Waste Manifest Program

265.1300. Applicability.

(a) This subpart prescribes:

(1) The methodology by which EPA will determine the user fees which owners or operators of facilities must pay for activities and manifest related services provided by EPA through the development and operation of the electronic hazardous waste manifest system (e-Manifest system); and

(2) The process by which EPA will revise e-Manifest system fees and provide notice of the fee schedule revisions to owners or operators of facilities.

(b) The fees determined under this subpart apply to owners or operators of facilities whose activities receiving, rejecting, or managing federally- or state-regulated wastes or other materials bring them within the definition of “user of the electronic manifest system” under section 260.10.

HISTORY: Added by SCSR 43-11 Doc. No. 4882, eff November 22, 2019.

265.1310. Definitions applicable to this subpart.

The following definitions apply to this subpart:

“**Consumer price index**” means the consumer price index for all U.S. cities using the “U.S. city average” area, “all items” and “not seasonally adjusted” numbers calculated by the Bureau of Labor Statistics in the Department of Labor.

“**CROMERR costs**” are the sub-category of operations and maintenance costs that are expended by EPA in implementing electronic signature, user registration, identity proofing, and copy of record solutions that meet EPA’s electronic reporting regulations as set forth in the Cross Media Electronic Reporting Rule (CROMERR) as codified at 40 CFR part 3.

“**Electronic manifest submissions**” means manifests that are initiated electronically using the electronic format supported by the e-Manifest system, and that are signed electronically and submitted electronically to the e-Manifest system by facility owners or operators to indicate the receipt or rejection of the wastes identified on the electronic manifest. Electronic manifest submissions include the hybrid or mixed paper/electronic manifests authorized under section 262.24(c)(1).

“**EPA program costs**” mean the Agency’s intramural and non-information technology extramural costs expended in the design, development and operations of the e-Manifest system, as well as in regulatory development activities supporting e-Manifest, in conducting its capital planning, project management, oversight and outreach activities related to e-Manifest, in conducting economic analyses supporting e-Manifest, and in establishing the System Advisory Board to advise EPA on the system. Depending on the date on which EPA program costs are incurred, these costs may be further classified as either system setup costs or operations and maintenance costs.

“**Help desk costs**” mean the costs incurred by EPA or its contractors to operate the e-Manifest Help Desk, which EPA will establish to provide e-Manifest system users with technical assistance and related support activities.

“**Indirect costs**” mean costs not captured as marginal costs, system setup costs, or operations and maintenance costs, but that are necessary to capture because of their enabling and supporting nature, and to ensure full cost recovery. Indirect costs include, but are not limited to, such cost items as physical overhead, maintenance, utilities, and rents on land, buildings, or equipment. Indirect costs

also include the EPA costs incurred from the participation of EPA offices and upper management personnel outside of the lead program office responsible for implementing the e-Manifest program.

“**Manifest submission type**” means the type of manifest submitted to the e-Manifest system for processing, and includes electronic manifest submissions and paper manifest submissions.

“**Marginal labor costs**” mean the human labor costs incurred by staff operating the paper manifest processing center in conducting data key entry, quality assurance (QA), scanning, copying, and other manual or clerical functions necessary to process the data from paper manifest submissions into the e-Manifest system’s data repository.

“**Operations and maintenance costs**” mean all system related costs incurred by EPA or its contractors after the activation of the e-Manifest system. Operations and maintenance costs include the costs of operating the electronic manifest information technology system and data repository, CROM-ERR costs, help desk costs, EPA program costs incurred after e-Manifest system activation, and the costs of operating the paper manifest processing center, other than the paper processing center’s marginal labor costs.

“**Paper manifest submissions**” mean submissions to the paper processing center of the e-Manifest system by facility owners or operators, of the data from the designated facility copy of a paper manifest, EPA Form 8700–22, or a paper Continuation Sheet, EPA Form 8700–22A. Such submissions may be made by mailing the paper manifests or continuation sheets, by submitting image files from paper manifests or continuation sheets in accordance with section 265.1311(b), or by submitting both an image file and data file in accordance with the procedures of section 265.1311(c).

“**System setup costs**” mean all system related costs, intramural or extramural, incurred by EPA prior to the activation of the e-Manifest system. Components of system setup costs include the procurement costs from procuring the development and testing of the e-Manifest system, and the EPA program costs incurred prior to e-Manifest system activation.

HISTORY: Added by SCSR 43–11 Doc. No. 4882, eff November 22, 2019.

265.1311. Manifest transactions subject to fees.

(a) Per manifest fee. Fees shall be assessed on a per manifest basis for the following manifest submission transactions:

(1) The submission of each electronic manifest that is electronically signed and submitted to the e-Manifest system by the owners or operators of receiving facilities, with the fee assessed at the applicable rate for electronic manifest submissions;

(2) The submission of each paper manifest submission to the paper processing center signed by owners or operators of receiving facilities, with the fee assessed according to whether the manifest is submitted to the system by mail, by the upload of an image file, or by the upload of a data file representation of the paper manifest; and

(3) The submission of copies of return shipment manifests by facilities that are rejecting hazardous wastes and returning hazardous wastes under return manifests to the original generator. This fee is assessed for the processing of the return shipment manifest(s), and is assessed at the applicable rate determined by the method of submission. The submission shall also include a copy of the original signed manifest showing the rejection of the wastes.

(b) Image file uploads from paper manifests. Receiving facilities may submit image file uploads of completed, ink-signed manifests in lieu of submitting mailed paper forms to the e-Manifest system. Such image file upload submissions may be made for individual manifests received by a facility or as a batch upload of image files from multiple paper manifests received at the facility:

(1) The image file upload must be made in an image file format approved by EPA and supported by the e-Manifest system; and

(2) At the time of submission of an image file upload, a responsible representative of the receiving facility must make a CROMERR compliant certification that to the representative’s knowledge or belief, the submitted image files are accurate and complete representations of the facility’s received manifests, and that the facility acknowledges that it is obligated to pay the applicable per manifest fee for each manifest included in the submission.

(c) Data file uploads from paper manifests. Receiving facilities may submit data file representations of completed, ink-signed manifests in lieu of submitting mailed paper forms or image files to the e-Manifest system. Such data file submissions from paper manifests may be made for individual manifests received by a facility or as a batch upload of data files from multiple paper manifests received at the facility.

(1) The data file upload must be made in a data file format approved by EPA and supported by the e-Manifest system;

(2) The receiving facility must also submit an image file of each manifest that is included in the individual or batch data file upload; and

(3) At the time of submission of the data file upload, a responsible representative of the receiving facility must make a CROMERR compliant certification that to the representative's knowledge or belief, the data and images submitted are accurate and complete representations of the facility's received manifests, and that the facility acknowledges that it is obligated to pay the applicable per manifest fee for each manifest included in the submission.

HISTORY: Added by SCSR 43-11 Doc. No. 4882, eff November 22, 2019.

265.1312. User fee calculation methodology.

(a) The fee calculation formula or methodology that EPA will use initially to determine per manifest fees is as follows:

$Fee_i = (\text{System Setup Cost}/[\text{Years} \times N_i]) + (\text{Marginal Cost}_i + [\text{O\&M Cost}/N_i]) \times (1 + \text{Indirect Cost Factor})$

System Setup Cost = Procurement Cost + EPA Program Cost

O&M Cost = Electronic System O&M Cost + Paper Center O&M Cost + Help Desk Cost + EPA Program Cost + CROMERR Cost + LifeCycle Cost to Modify or Upgrade eManifest System Related Services

Where Fee_i represents the per manifest fee for each manifest submission type "i" and N_i refers to the total number of manifests completed in a year.

(b)(1) If after four (4) years of system operations, electronic manifest usage does not equal or exceed seventy-five (75) percent of total manifest usage, EPA may transition to the following formula or methodology to determine per manifest fees:

$Fee_i = (\text{System Setup Cost}/[\text{Years} \times N_i]) + (\text{Marginal Cost}_i + [\text{O\&M}_i \text{ Cost}/N_i]) \times (1 + \text{Indirect Cost Factor})$

System Setup Cost = Procurement Cost + EPA Program Cost

O&M_{fully electronic} Cost = Electronic System O&M Cost + Help Desk Cost + EPA Program Cost + CROMERR Cost + LifeCycle Cost to Modify or Upgrade eManifest System Related Services

O&M_{all other} Cost = Electronic System O&M Cost + Paper Center O&M Cost + Help Desk Cost + EPA Program Cost + CROMERR Cost + LifeCycle Cost to Modify or Upgrade eManifest System Related Services

Where N_i refers to the total number of one (1) of the four (4) manifest submission types "i" completed in a year and $O\&M_i \text{ Cost}$ refers to the differential O&M Cost for each manifest submission type "i."

(2) At the completion of four (4) years of system operations, EPA shall publish a notice:

(i) Stating the date upon which the fee formula set forth in paragraph (b)(1) of this section shall become effective; or

(ii) Stating that the fee formula in paragraph (b)(1) of this section shall not go into effect under this section, and that the circumstances of electronic manifest adoption and the appropriate fee response shall be referred to the System Advisory Board for the Board's advice.

HISTORY: Added by SCSR 43-11 Doc. No. 4882, eff November 22, 2019.

265.1313. User fee revisions.

(a) Revision schedule.

(1) EPA will revise the fee schedules for e-Manifest submissions and related activities at two-year intervals, by utilizing the applicable fee calculation formula prescribed in section 265.1312 and the most recent program cost and manifest usage numbers.

(2) The fee schedules will be published to users through the e-Manifest program website by July 1 of each odd numbered calendar year, and will cover the next two (2) fiscal years beginning on October 1 of that year and ending on September 30 of the next odd numbered year.

(b) Inflation adjuster. The second year of each two-year fee schedule shall be adjusted for inflation by using the following adjustment formula:

$$Fee_{iYear\ 2} = Fee_{iYear1} \times (CPI_{Year2-2}/CPI_{Year2-1})$$

Where:

Fee_{iYear2} is the Fee for each type of manifest submission “i” in Year 2 of the fee cycle;

Fee_{iYear1} is the Fee for each type of manifest submission “i” in Year 1 of the fee cycle; and

$CPI_{Year2-2}/CPI_{Year2-1}$ is the ratio of the CPI published for the year two (2) years prior to Year 2 to the CPI for the year one (1) year prior to Year 2 of the cycle.

(c) Revenue recovery adjusters. The fee schedules published at two-year intervals under this section shall include an adjustment to recapture revenue lost in the previous two-year fee cycle on account of imprecise estimates of manifest usage. This adjustment shall be calculated using the following adjustment formula to calculate a revenue recapture amount which will be added to O&M Costs in the fee calculation formula of section 265.1312:

$$\text{Revenue Recapture}_i = [(N_{iYear1} + N_{iYear2})_{\text{Actual}} - (N_{iYear1} + N_{iYear2})_{\text{Est}}] \times Fee_{i(Ave)}$$

Where:

$\text{Revenue Recapture}_i$ is the amount of fee revenue recaptured for each type of manifest submission “i;”

$(N_{iYear1} + N_{iYear2})_{\text{Actual}} - (N_{iYear1} + N_{iYear2})_{\text{Est}}$ is the difference between actual manifest numbers submitted to the system for each manifest type during the previous two-year cycle, and the numbers estimated when we developed the previous cycle’s fee schedule; and

$Fee_{i(Ave)}$ is the average fee charged per manifest type over the previous two-year cycle.

HISTORY: Added by SCSR 43–11 Doc. No. 4882, eff November 22, 2019.

265.1314. How to make user fee payments.

(a) All fees required by this subpart shall be paid by the owners or operators of the receiving facility in response to an electronic invoice or bill identifying manifest-related services provided to the user during the previous month and identifying the fees owed for the enumerated services.

(b) All fees required by this subpart shall be paid to EPA by the facility electronically in U.S. dollars, using one of the electronic payment methods supported by the Department of the Treasury’s pay.gov online electronic payment service, or any applicable additional online electronic payment service offered by the Department of Treasury.

(c) All fees for which payments are owed in response to an electronic invoice or bill must be paid within thirty (30) days of the date of the invoice or bill.

HISTORY: Added by SCSR 43–11 Doc. No. 4882, eff November 22, 2019.

265.1315. Sanctions for delinquent payments.

(a) Interest. In accordance with 31 U.S.C. 3717(a)(1), delinquent e-Manifest user fee accounts shall be charged a minimum annual rate of interest equal to the average investment rate for Treasury tax and loan accounts (Current Value of Funds Rate or CVFR) for the twelve-month period ending September 30 of each year, rounded to the nearest whole percent.

(1) E-Manifest user fee accounts are delinquent if the accounts remain unpaid after the due date specified in the invoice or other notice of the fee amount owed.

(2) Due dates for invoiced or electronically billed fee amounts shall be thirty (30) days from the date of the electronic invoice or bill.

(b) Financial penalty. In accordance with 31 U.S.C. 3717(e), e-Manifest user fee accounts that are more than ninety (90) days past due (i.e., not paid by date one hundred twenty (120) days from date of invoice) shall be charged an additional penalty of six (6) percent per year assessed on any part of the debt that is past due for more than ninety (90) days, plus any applicable processing and handling charges.

(c) Compliance with manifest perfection requirement. A manifest is fully perfected when:

(1) The manifest has been submitted by the owner or operator of a receiving facility to the e-Manifest system, as either an electronic submission or a paper manifest submission; and

(2) All user fees arising from the submission of the manifest have been fully paid.

HISTORY: Added by SCSR 43-11 Doc. No. 4882, eff November 22, 2019.

265.1316. Informal fee dispute resolution.

(a) Users of e-Manifest services that believe their invoice or charges to be in error must present their claims for fee dispute resolution informally using the process described in this section.

(b) Users asserting a billing dispute claim must first contact the system's billing representatives by phone or email at the phone number or email address provided for this purpose on the e-Manifest program's website or other customer services directory.

(1) The fee dispute claimant must provide the system's billing representatives with information identifying the claimant and the invoice(s) that are affected by the dispute, including:

(i) The claimant's name, and the facility at which the claimant is employed;

(ii) The EPA Identification Number of the affected facility;

(iii) The date, invoice number, or other information to identify the particular invoice(s) that is the subject of the dispute; and

(iv) A phone number or email address where the claimant can be contacted.

(2) The fee dispute claimant must provide the system's billing representatives with sufficient supporting information to identify the nature and amount of the fee dispute, including:

(i) If the alleged error results from the types of manifests submitted being inaccurately described in the invoice, the correct description of the manifest types that should have been billed;

(ii) If the alleged error results from the number of manifests submitted being inaccurately described in the invoice, the correct description of the number of manifests that should have been billed;

(iii) If the alleged error results from a mathematical error made in calculating the amount of the invoice, the correct fee calculations showing the corrected fee amounts; and

(iv) Any other information from the claimant that explains why the invoiced amount is in error and what the fee amount invoiced should be if corrected.

(3) EPA's system billing representatives must respond to billing dispute claims made under this section within ten (10) days of receipt of a claim. In response to a claim, the system's billing representative will:

(i) State whether the claim is accepted or rejected, and if accepted, the response will indicate the amount of any fee adjustment that will be refunded or credited to the facility; and

(ii) If a claim is rejected, then the response shall provide a brief statement of the reasons for the rejection of the claim and advise the claimant of their right to appeal the claim to the Office Director for the Office of Resource Conservation and Recovery.

(c) Fee dispute claimants that are not satisfied by the response to their claim from the system's billing representatives may appeal their claim and initial decision to the Office Director for the Office of Resource Conservation and Recovery.

(1) Any appeal from the initial decision of the system's billing representatives must be taken within ten (10) days of the initial decision of the system's billing representatives under paragraph (b) of this section.

(2) The claimant shall provide the Office Director with the claim materials submitted to the system's billing representatives, the response provided by the system's billing representatives to the

claim, and a brief written statement by the claimant explaining the nature and amount of the billing error, explaining why the claimant believes the decision by the system's billing representatives is in error, and why the claimant is entitled to the relief requested on its appeal.

(3) The Office Director shall review the record presented to him or her on an appeal under this paragraph (c), and shall determine whether the claimant is entitled to relief from the invoice alleged to be in error, and if so, shall state the amount of the recalculated invoice and the amount of the invoice to be adjusted.

(4) The decision of the Office Director on any appeal brought under this section is final and non-reviewable.

HISTORY: Added by SCSR 43-11 Doc. No. 4882, eff November 22, 2019.

**61-79.266. STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES
AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES.**

SUBPART C

Recyclable Materials Used in a Manner Constituting Disposal

266.20. Applicability.

(a) The regulations of this Subpart apply to recyclable materials that are applied to or placed on the land;

(1) without mixing with any other substance(s); or

(2) after mixing or combination with any other substance(s). These materials will be referred to throughout this subpart as "materials used in a manner that constitutes disposal."

(b) Products produced for the general public's use that are used in a manner that constitutes disposal and that contain recyclable materials are not presently subject to regulation if the recyclable materials have undergone a chemical reaction in the course of producing the products so as to become inseparable by physical means and if such products meet the applicable treatment standards in subpart D of part 268 (or applicable prohibition levels in 268.32 of this chapter or RCRA section 3004(d), where no treatment standards have been established) for each recyclable material (i.e., hazardous waste) that they contain and the recycler complies with 268.7(b)(6) of this chapter.

(c) Anti-skid/deicing uses of slags which are generated from high temperature metals recovery (HTMR) processing of hazardous waste K061, K062, and F006, in a manner constituting disposal are not covered by the exemption in paragraph (b) of this section and remain subject to regulation (9/98).

(d) Fertilizers that contain recyclable materials are not subject to regulation provided that:

(1) They are zinc fertilizers excluded from the definition of solid waste according to 261.4(a)(21);

(2) They meet the applicable treatment standards in subpart D of Part 268 for each hazardous waste that they contain.

HISTORY: Amended by State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 36, Issue No. 9, eff September 28, 2012; State Register Volume 39, Issue No. 6, Doc. No. 4541, eff June 26, 2015.

266.21. Standards applicable to generators and transporters of materials used in a manner that constitute disposal.

Generators and transporters of materials that are used in a manner that constitutes disposal are subject to the applicable requirements of R.61-79.262 and R.61-79.263 of this chapter, and the notification requirements under SCHWMA 44-56-120 or RCRA section 3010.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

266.22. Standards applicable to storers of materials that are to be used in a manner that constitutes disposal who are not the ultimate users.

Owners or operators of facilities that store recyclable materials that are to be used in a manner that constitutes disposal, but who are not the ultimate users of the materials, are regulated under all

applicable provisions of subparts A through L of R.61-79.264, R.61-79.265, R.61-79.124, and R.61-79.270 of this chapter and the notification requirements of RCRA section 3010 and the South Carolina Hazardous Waste Management Act 44-56-120. (amended 11/90)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992.

266.23. Standards applicable to users of materials that are used in a manner that constitutes disposal.

(a) Owners or operators of facilities that use recyclable materials in a manner that constitutes disposal are regulated under all applicable provisions of subparts A through N of R.61-79.124, R.61-79.264, R.61-79.265, R.61-79.268 and R.61-79.270 and the notification requirements under RCRA section 3010 and the South Carolina Hazardous Waste Management Act, 44-56-120. (These requirements do not apply to products which contain these recyclable materials under the provisions of Section 266.20(b).) (amended 11/90, 12/92; 5/96)

(b) The use of waste or used oil or other material, which is contaminated with dioxin or any other hazardous waste (other than a waste identified solely on the basis of ignitability) for dust suppression or road treatment is prohibited.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 20, Issue No. 5, eff May 24, 1996.

SUBPART F
Recyclable Materials Utilized for Precious Metal Recovery

266.70. Applicability and requirements.

(a) The regulations of this subpart apply to recyclable materials that are reclaimed to recover economically significant amounts of gold, silver, platinum, palladium, irridium, osmium, rhodium, ruthenium, or any combination of these.

(b) Persons who generate, transport, or store recyclable materials that are regulated under this subpart are subject to the following requirements:

(1) Notification requirements under SC Hazardous Waste Management Act 44-56-120 and section 3010 of RCRA;

(2) Subpart B of part 262 (for generators), 263.20 and 263.21 (for transporters), and 265.71 and 265.72 (for persons who store) of this chapter; and

(3) For precious metals exported to or imported from other countries for recovery, part 262 subpart H and 265.12.

(c) Persons who store recycled materials that are regulated under this Subpart must keep the following records to document that they are not accumulating these materials speculatively (as defined in R.61-79.261.1(c)):

(1) Records showing the volume of these materials stored at the beginning of the calendar year;

(2) The amount of these materials generated or received during the calendar year; and

(3) The amount of materials remaining at the end of the calendar year.

(d) Recyclable materials that are regulated under this Subpart that are accumulated speculatively (as defined in R.61-79.261.1(c)) are subject to all applicable provisions of R.61-79.262 through R.61-79.265, R.61-79.270 and R.61-79.124.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

SUBPART G
Spent Lead-acid Batteries Being Reclaimed

266.80. Applicability and requirements.

(a) Are spent lead-acid batteries exempt from hazardous waste management requirements? If you generate, collect, transport, store, or regenerate lead-acid batteries for reclamation purposes, you may

be exempt from certain hazardous waste management requirements. Use the following table to determine which requirements apply to you. Alternatively, you may choose to manage your spent lead-acid batteries under the “Universal Waste” rule in part 273.

Table 1 – 266.80 Applicability and requirements

If your batteries...	And if you...	Then you...	And you...
(1) Will be reclaimed through regeneration (such as by electrolyte replacement).		are exempt from parts 262 (except for section 262.11), 263, 264, 265, 266, 268, 270, 124 of this chapter, and the notification requirements of the South Carolina HWMA 44–56–120 and at section 3010 of RCRA.	are subject to part 261 and section 262.11.
(2) Will be reclaimed other than through regeneration.	generate, collect, and/or transport these batteries.	are exempt from parts 262 (except for section 262.11), 263, 264, 265, 266, 270, 124 of this chapter, and the notification requirements of South Carolina HWMA 44–56–120 and at section 3010 of RCRA	are subject to part 261, section 262.11, and applicable provisions under part 268.
(3) Will be reclaimed other than through regeneration	store these batteries but you aren’t the reclaimer.	are exempt from parts 262 (except for section 262.11), 263, 264, 265, 266, 270, 124, and the notification requirements of South Carolina HWMA 44–56–120 and at section 1310 of RCRA.	are subject to part 261, section 262.11, and applicable provisions under part 268.
(4) Will be reclaimed other than through regeneration.	Store these batteries before you reclaim them.	Must comply with section 266.80(b) and as appropriate other regulatory provisions described in section 266.80(b)	are subject to part 261, section 262.11, and applicable provisions under part 268.
(5) Will be reclaimed other than through regeneration.	don’t store these batteries before you reclaim them.	are exempt from parts 262 (except for section 262.11), 263, 264, 265, 266, 270, 124, and the notification requirements of South Carolina HWMA 44–56–120 and at section 3010 of RCRA	are subject to part 261, section 262.11, and applicable provisions under part 268
(6) Will be reclaimed through regeneration or any other means	export these batteries for reclamation in a foreign country	are exempt from parts 262 (except for sections 262.11, 262.18 and subpart H), 263, 264, 265, 266, 268, 270, 124, and the notification requirements at the SC Hazardous Waste Management Act 44–56–120 and section 3010 of RCRA.	are subject to part 261, sections 262.11, 262.18, and part 262 subpart H.
(7) Will be reclaimed through regeneration or any other means	Transport these batteries in the U.S. to export them for reclamation in a foreign country	are exempt from parts 263, 264, 265, 266, 268, 270, 124, and the notification requirements at the SC Hazardous Waste Management Act 44–56–120 and section 3010 of RCRA	must comply with applicable requirements in part 262, subpart H.
(8) Will be reclaimed other than through regeneration	Import these batteries from a foreign country and store these batteries but you aren’t the reclaimer	are exempt from parts 262 (except for sections 262.11, 262.18, and subpart H), 263, 264, 265, 266, 270, 124, and the notification requirements at the SC Hazardous Waste Man-	are subject to part 261, sections 262.11, 262.18, part 262 subpart H, and appli-

		agement Act 44–56–120 and section 3010 of RCRA	cable provisions under part 268.
(9) Will be reclaimed other than through regeneration	Import these batteries from a foreign country and store these batteries before you reclaim them	must comply with section 266.80(b) and as appropriate other regulatory provisions described in section 266.80(b)	are subject to part 261, sections 262.11, 262.18, part 262 subpart H, and applicable provisions under part 268.
(10) Will be reclaimed other than through regeneration	Import these batteries from a foreign country and don't store these batteries before you reclaim them	are exempt parts 262 (except for sections 262.11, 262.18, and subpart H), 263, 264, 265, 266, 270, 124, and the notification requirements at SC Hazardous Waste Management Act 44–56–120 and section 3010 of RCRA	are subject to part 261, sections 262.11, 262.18, part 262 subpart H, and applicable provisions under part 268.

(b) If I store spent lead-acid batteries before I reclaim them but not through regeneration, which requirements apply? The requirements of paragraph (b) of this section apply to you if you store spent lead-acid batteries before you reclaim them, but you don't reclaim them through regeneration. The requirements are slightly different depending on your RCRA permit status.

(1) For Interim Status Facilities, you must comply with:

- (i) Notification requirements of South Carolina HWMA 44–56–120 and under section 3010 of RCRA.
- (ii) All applicable provisions in subpart A of part 265 of this chapter.
- (iii) All applicable provisions in subpart B of part 265 of this chapter except 265.13 (waste analysis).
- (iv) All applicable provisions in subparts C and D of part 265 of this chapter.
- (v) All applicable provisions in subpart E of part 265 of this chapter except 265.71 and 265.72 (dealing with the use of the manifest and manifest discrepancies).
- (vi) All applicable provisions in subparts F through L of part 265 of this chapter.
- (vii) All applicable provisions in parts 270 and 124 of this chapter.

(2) For Permitted Facilities.

- (i) Notification requirements of South Carolina HWMA 44–56–120 and under section 3010 of RCRA.
- (ii) All applicable provisions in subpart A of part 264 of this chapter.
- (iii) All applicable provisions in subpart B of part 264 of this chapter (but not 264.13 (waste analysis)).
- (iv) All applicable provisions in subparts C and D of part 264 of this chapter.
- (v) All applicable provisions in subpart E of part 264 of this chapter except 264.71 or 264.72 (dealing with the use of the manifest and manifest discrepancies).
- (vi) All applicable provisions in subparts F through L of part 264 of this chapter.
- (vii) All applicable provisions in parts 270 and 124 of this chapter.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 42–12 Doc. No. 4840, eff December 28, 2018; SCSR 46–5 Doc. No. 5058, eff May 27, 2022.

SUBPART H
Hazardous Waste Burned in Boilers and Industrial Furnaces

266.100. Applicability (6/03).

(a) The regulations of this Subpart apply to hazardous waste burned or processed in a boiler or industrial furnace (as defined in 260.10) irrespective of the purpose of burning or processing, except as provided by paragraphs (b), (c), (d), (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 emissions standards of 266.104, 266.105, 266.106, and 266.107 apply to facilities operating under interim status or under a permit as specified in R.61–79.266.102 and 266.103.

(b) Integration of the MACT standards.

(1) Except as provided by (b)(2), (b)(3), and (b)(4) of this section, the standards do not apply to a new hazardous waste boiler or industrial furnace unit that becomes subject to RCRA permit requirements after October 12, 2005; or no longer apply when an owner or operator of an existing hazardous waste boiler or industrial furnace unit demonstrates compliance with the maximum achievable control technology (MACT) requirements of 40 CFR part 63, Subpart EEE, by conducting a comprehensive performance test and submitting to the Department a Notification of Compliance under 63.1207(j) and 63.1210(d) documenting compliance with the requirements of 40 CFR part 63, Subpart EEE. Nevertheless, even after this demonstration of compliance with the MACT standards, RCRA permit conditions that were based on the standards will continue to be in effect until they are removed from the permit or the permit is terminated or revoked, unless the permit expressly provides otherwise.

(2) The following standards continue to apply:

(i) If you elect to comply with 270.235(a)(1)(i) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events, 266.102(e)(1) requiring operations in accordance with the operating requirements specified in the permit at all times that hazardous waste is in the unit, and 266.102(e)(2)(iii) requiring compliance with the emission standards and operating requirements during startup and shutdown if hazardous waste is in the combustion chamber, except for particular hazardous wastes. These provisions apply only during startup, shutdown, and malfunction events;

(ii) The closure requirements of 266.102(e)(11) and 266.103(l);

(iii) The standards for direct transfer of 266.111;

(iv) The standards for regulation of residues of 266.112; and

(v) The applicable requirements of Subparts A through H, BB and CC of parts 264 and 265.

(3) If you own or operate a boiler or hydrochloric acid production furnace that is an area source under section 63.2 and you elect not to comply with the emission standards under sections 63.1216, 63.1217, and 63.1218 for particulate matter, semivolatile and low volatile metals, and total chlorine, you also remain subject to:

(i) 266.105—Standards to control particulate matter;

(ii) 266.106—Standards to control metals emissions, except for mercury; and

(iii) 266.107—Standards to control hydrogen chloride and chlorine gas.

(4) The particulate matter standard of 266.105 remains in effect for boilers that elect to comply with the alternative to the particulate matter standard under sections 63.1216(e) and 63.1217(e).

(c) The following hazardous wastes and facilities are not subject to regulation under this Subpart: (9/01)

(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 261. Such used oil is subject to regulation under R.61–107.279;

(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 sections 261.4 and 261.6(a)(3)(iii) and (vi), and hazardous wastes that are subject to the special requirements for very small quantity generators under section 262.14; and

(4) Coke ovens, if the only hazardous waste burned is EPA Hazardous Waste No. K087, decanter tank tar sludge from coking operations.

(d) 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 266.101 and 266.112. (9/01)

(1) To be exempt from 266.102 through 266.111, 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 (d)(3), 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 (h).

(i) Provide a one-time written notice to the Department 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 (c)(2) of this section;

(C) The hazardous waste contains recoverable levels of metals; and

(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 under procedures specified by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, incorporated by reference in 260.11 of this chapter or alternative methods that meet or exceed the SW-846 method performance capabilities. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method; and feedstocks.

(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 this chapter 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 (d)(1)(iii); or (12/93)

(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 (d)(1)(iii).

(3) To be exempt from 266.102 through 266.111, 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 (d)(1). The owners or operator must comply with the requirements of paragraph (d)(1) of this section for those wastes claimed to be exempt under that paragraph and must comply with the requirements below for those wastes claimed to be exempt under this paragraph (d)(3)(i). (12/93, 5/96)

(i) The hazardous wastes listed in Appendices XI, XII, and XIII, part 266, and baghouse bags used to capture metallic dusts emitted by steel manufacturing are exempt from the requirements of paragraph (d)(1) of this section, provided that: (12/93; 5/96)

(A) A waste listed in appendix XI must contain recoverable levels of lead, a waste listed in appendix XII of this part must contain recoverable levels of nickel or chromium, a waste listed in appendix XIII of this part must contain recoverable levels of mercury and contain less than 500 ppm of R.61-70.261, Appendix VIII organic constituents, and baghouse bags used to capture metallic dusts emitted by steel manufacturing must contain recoverable levels of metal; and (revised 5/96)

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

(C) The waste is not a hazardous waste listed in subpart D of part 261 of this chapter because it is listed for an organic constituent as identified in appendix VII of part 261 of this chapter; and

(D) The owner or operator certifies in the one-time notice that hazardous waste is burned under the provisions of (d)(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 (d)(1)(ii) of this section and records to document compliance with (d)(3) of this section shall be kept for at least three years.

(ii) The Department may decide on a case-by-case basis that the toxic organic constituents in a material listed in appendix XI, XII, or XIII of this part that contains a total concentration of more than 500 ppm toxic organic compounds listed in appendix VIII, part 261 of this chapter, 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 Department will consider the following factors: (added 12/93; revised 5/96)

(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 of this part 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.

(e) The standards for direct transfer operations under 266.111 apply only to facilities subject to the permit standards of 266.102 or the interim status standards of 266.103. (9/01)

(f) The management standards for residues under 266.112 apply to any boiler or industrial furnace burning hazardous waste.

(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 266.112. To be exempt from 266.101 through 266.111 an owner or operator must: (12/93, 9/01)

(1) Provide a one-time written notice to the Department 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 is burned for recovery of economically significant amounts of precious metal using procedures specified by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, incorporated by reference in 260.11 of this chapter or alternative methods that meet or exceed the SW-846 method performance capabilities. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method; 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) Starting June 23, 1997, 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, except for 266.101. To be exempt, an owner or operator must provide a one-time notice to the Department 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 less than 500 ppm by weight, as fired and as provided in paragraph (d)(2)(i), or is listed in Appendix XI.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 27, Issue No. 7, Part 1, eff June 27, 2003; State Register Volume 30, Issue No. 6, eff June 23, 2006; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 34, Issue No. 5, eff May 28, 2010; SCSR 44-6 Doc. No. 4883, eff June 26, 2020; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

266.101. Management prior to burning.

(a) Generators. Generators of hazardous waste that is burned in a boiler or industrial furnace are subject to part 262 of this chapter.

(b) Transporters. Transporters of hazardous waste that is burned in a boiler or industrial furnace are subject to part 263 of this chapter.

(c) Storage and Treatment Facilities. (9/01)

(1) Owners and operators of facilities that store or treat hazardous waste that is burned in a boiler or industrial furnace are subject to the applicable provisions of parts 264, 265, and 270 of this chapter, except as provided by paragraph (c)(2) of this section. These standards apply to storage and treatment by the burner as well as to storage and treatment facilities operated by intermediaries (processors, blenders, distributors, etc.) between the generator and the burner. (12/93, 9/01)

(2) Owners and operators of facilities that burn, in an onsite boiler or industrial furnace exempt from regulation under the small quantity burner provisions of 266.108, hazardous waste that they generate are exempt from the regulations of parts 264, 265, and 270 of this chapter applicable to storage units for those storage units that store mixtures of hazardous waste and the primary fuel to the boiler or industrial furnace in tanks that feed the fuel mixture directly to the burner. Storage of hazardous waste prior to mixing with the primary fuel is subject to regulation as prescribed in paragraph (c)(1) of this section.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003.

266.102. Permit standards for burners.

(a) Applicability.

(1) General. Owners and operators of boilers and industrial furnaces burning hazardous waste and not operating under interim status must comply with the requirements of this section and 270.22 and 270.66 of this chapter, unless exempt under the small quantity burner exemption of 266.108.

(2) Applicability of part 264 standards. Owners and operators of boilers and industrial furnaces that burn hazardous waste are subject to the following provisions of part 264 of this chapter, except as provided otherwise by this subpart:

- (i) In subpart A (General), 264.4;
- (ii) In subpart B (General facility standards), 264.11 through 264.18;
- (iii) In subpart C (Preparedness and prevention), 264.31 through 264.37;
- (iv) In subpart D (Contingency plan and emergency procedures), 264.51 through 264.56;
- (v) In subpart E (Manifest system, recordkeeping, and reporting), the applicable provisions of 264.71 through 264.77;
- (vi) In subpart F (Releases from Solid Waste Management Units), 264.90 and 264.101;
- (vii) In subpart G (Closure and postclosure), 264.111 through 264.115;
- (viii) In subpart H (Financial requirements), 264.141, 264.142, 264.143, and 264.147 through 264.151, except that States and the Federal government are exempt from the requirements of subpart H; and
- (ix) Subpart BB (Air emission standards for equipment leaks), except 264.1050(a).

(b) Hazardous waste analysis.

(1) 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 analytical procedures prescribed by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (incorporated by reference, see 260.11 of this chapter). Alternative methods that meet or exceed the method performance capabilities of SW-846 methods may be used. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method. 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 270.22 and 270.66 of this chapter and to enable the permit writer to prescribe such permit conditions as necessary to protect human health and the 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 270.66(g) of this chapter as well as any other analysis required by the permit authority in preparing the permit. Owners and operators of boilers and industrial furnaces not operating under the interim status standards must provide the information required by 270.22 or 270.66(c) of this chapter in the part B application to the greatest extent possible.

(2) Throughout normal operation, the owner or operator must conduct sampling and analysis as necessary to ensure that the hazardous waste, other fuels, and industrial furnace feedstocks fired into the boiler or industrial furnace are within the physical and chemical composition limits specified in the permit.

(c) Emissions standards. Owners and operators must comply with emissions standards provided by 266.104 through 266.107.

(d) Permits.

(1) The owner or operator may burn only hazardous wastes specified in the facility permit and only under the operating conditions specified under paragraph (e) of this section, except in approved trial burns under the conditions specified in 270.66 of this chapter.

(2) Hazardous wastes not specified in the permit may not be burned until operating conditions have been specified under a new permit or 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 270.22 of this chapter.

(3) Boilers and industrial furnaces operating under the interim status standards of 266.103 are permitted under procedures provided by 270.66(g) of this chapter.

(4) A permit for a new boiler or industrial furnace (those boilers and industrial furnaces not operating under the interim status standards) must establish appropriate conditions for each of the applicable requirements of this section, including but not limited to allowable hazardous waste firing rates and operating conditions necessary to meet the requirements of paragraph (e) of this section, in order to comply with the following standards:

(i) For the period beginning with initial introduction of hazardous waste and ending with initiation of the trial burn, and only for the minimum time required to bring the device to a point of operational readiness to conduct a trial burn, not to exceed a duration of 720 hours operating time when burning hazardous waste, the operating requirements must be those most likely to ensure compliance with the emission standards of 266.104 through 266.107, based on the Department's engineering judgment. If the applicant is seeking a waiver from a trial burn to demonstrate conformance with a particular emission standard, the operating requirements during this initial period of operation shall include those specified by the applicable provisions of 266.104, 266.105, 266.106, or 266.107. The Department may extend the duration of this period 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 emissions standards of 266.104 through 266.107 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, review of the trial burn results and modification of the facility permit by the Department to reflect the trial burn results, the operating requirements must be those most likely to ensure compliance with the emission standards 266.104 through 266.107 based on the Department's engineering judgment.

(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 270.22 of this chapter, as sufficient to ensure compliance with the emissions standards of 266.104 through 266.107.

(e) Operating requirements.

(1) General. A boiler or industrial furnace burning hazardous waste must be operated in accordance with the operating requirements specified in the permit at all times where there is hazardous waste in the unit.

(2) Requirements to ensure compliance with the organic emissions 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 270.22) to be sufficient to comply with the destruction and removal efficiency (DRE) performance standard of 266.104(a) or as those special operating requirements provided by 266.104(a)(4) for the waiver of the DRE trial burn. When the DRE trial burn is not waived under 266.104(a)(4), 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 (e)(6) 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 (e)(6) of this section;

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

(D) Allowable variation in 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 (e)(6) of this section;

(F) An appropriate indicator of combustion gas velocity, measured and specified as prescribed in paragraph (e)(6) of this section, unless documentation is provided under 270.66 of this chapter demonstrating adequate combustion gas residence time; and

(G) Such other operating requirements as are necessary to ensure that the DRE performance standard of 266.104(a) is met.

(ii) Carbon monoxide and hydrocarbon standards. The permit must incorporate a carbon monoxide (CO) limit and, as appropriate, a hydrocarbon (HC) limit as provided by paragraphs (b), (c), (d), (e) and (f) of 266.104. The permit limits will be specified as follows:

(A) When complying with the CO standard of 266.104(b)(1), the permit limit is 100 ppmv;

(B) When complying with the alternative CO standard under 266.104(c), 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 266.104(c)(1)), except as provided in 266.104(f).

(C) When complying with the alternative HC limit for industrial furnaces under 266.104(f), the permit limit for HC and CO is the baseline level when hazardous waste is not burned as specified by that paragraph.

(iii) Startup and shutdown. During startup and shutdown of the 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, and except low risk waste exempt from the trial burn requirements under 266.104(a)(5), 266.105, 266.106, and 266.107) 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) Except as provided in paragraphs (e)(3) (ii) and (iii) of this section, the permit shall specify the following operating requirements to ensure conformance with the particulate standard specified in 266.105:

(A) Total ash feed rate to the device from hazardous waste, other fuels, and industrial furnace feedstocks, measured and specified as prescribed in paragraph (e)(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 (e)(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 boiler and 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 266.105(a) is met.

(ii) Permit conditions to ensure conformance with the particulate matter standard shall not be provided for facilities exempt from the particulate matter standard under 266.105(b);

(iii) For cement kilns and light weight aggregate kilns, permit conditions to ensure compliance with the particulate standard shall not limit the ash content of hazardous waste or other feed materials.

(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 266.106, 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 (e)(6) of this section;

(B) Total feed rate of hazardous waste measured and specified as prescribed in paragraph (e)(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 266.106(c) and the Tier III metals controls under 266.106(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 (e)(6)(i) of this section;
 - (C) Feed rate of each metal in the following feedstreams, measured and specified as prescribed in paragraphs (e)(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 (e)(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 (e)(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 (e)(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 (e)(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 boiler and 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 266.106(c) or 266.106(d) are met.
- (iii) For conformance with an alternative implementation approach approved by the Department under 266.106(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 (e)(6)(i) of this section;
 - (C) Feed rate of each metal in the following feedstreams, measured and specified as prescribed in paragraph (e)(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 feed streams measured and specified as prescribed in paragraph (e)(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 (e)(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 (e)(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 (e)(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 boiler and 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 266.106(c) or 266.106(d) are met.
- (5) Requirements to ensure conformance with the hydrogen chloride and chlorine gas standards.

(i) For conformance with the Tier I total chloride and chlorine feed rate screening limits of 266.107(b)(1), the permit will specify the following operating requirements:

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

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

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

(ii) For conformance with the Tier II HCl and Cl₂ emission rate screening limits under 266.107(b)(2) and the Tier III HCl and Cl₂ controls under 266.107(c), the permit will specify the following operating requirements:

(A) Maximum emission rate for HCl and for Cl₂ specified as the average emission rate during the trial burn;

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

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

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

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

(F) Allowable variation in boiler and 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 Cl₂ standards under 266.107 (b)(2) or (c) are met.

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

(i) General requirements. As specified in paragraphs (e)(2) through (e)(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 and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (e)(6)(i) 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 chloride and chlorine, and ash. Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored by knowing 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 (e)(6) (i) and (ii) of this section.

(iv) Conduct of trial burn testing.

(A) If compliance with all applicable emissions standards of 266.104 through 266.107 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 as close as possible to the original operating conditions.

(B) Prior to obtaining test data for purposes of demonstrating compliance with the emissions standards of 266.104 through 266.107 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 Department 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 266.106(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/Cl₂, organic compounds) for which the parameter must be established as specified by paragraph (e) of this section.

(7) General requirements

(i) Fugitive emissions. Fugitive emissions must be controlled by:

(A) Keeping the combustion zone totally sealed against fugitive emissions; or

(B) Maintaining the combustion zone pressure lower than atmospheric pressure; or

(C) 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.

(ii) Automatic waste feed cutoff. A 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 Department may limit the number of cutoffs per an operating period on a case-by-case basis. In addition:

(A) 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,

(B) 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

(C) 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 Department 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.

(iii) Changes. A 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 boiler or industrial furnace design or operating conditions deviate from the limits as specified in the permit.

(8) Monitoring and Inspections.

(i) The owner or operator must monitor and record the following, at a minimum, while burning hazardous waste:

(A) If specified by the permit, feed rates and composition of hazardous waste, other fuels, and industrial furnace feedstocks, and feed rates of ash, metals, and total chloride and chlorine;

(B) If specified by the permit, carbon monoxide (CO), hydrocarbons (HC), and oxygen on a continuous basis at a common point in the 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 (e)(2)(ii) of this section. CO, HC, and oxygen monitors must be installed, operated, and maintained in accordance with methods specified in appendix IX of this part.

(C) Upon the request of the Department, sampling and analysis of the hazardous waste (and other fuels and industrial furnace feedstocks as appropriate), residues, and exhaust emissions must be conducted to verify that the operating requirements established in the permit achieve the applicable standards of 266.104, 266.105, 266.106, and 266.107.

(ii) All monitors shall record data in units corresponding to the permit limit unless otherwise specified in the permit.

(iii) The 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.

(iv) 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 Department 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.

(v) These monitoring and inspection data must be recorded and the records must be placed in the operating record required by 264.73 of this chapter.

(9) Direct transfer to the burner. If hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit, the owner and operator must comply with 266.111.

(10) 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.

(11) 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 boiler or industrial furnace.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 32, Issue No. 6, eff June 27, 2008.

266.103. Interim status standards for burners.

(a) Purpose, scope, applicability.

(1) General.

(i) The purpose of this section is to establish minimum national standards for owners and operators of "existing" boilers and industrial furnaces that burn hazardous waste where such

standards define the acceptable management of hazardous waste during the period of interim status. The standards of this section apply to owners and operators of existing facilities until either a permit is issued under 266.102(d) or until closure responsibilities identified in this section are fulfilled.

(ii) Existing or in existence means a boiler or industrial furnace that on or before August 21, 1991 is either in operation burning or processing hazardous waste or for which construction (including the ancillary facilities to burn or to process the hazardous waste) has commenced. A facility has commenced construction if the owner or operator has obtained the Federal, State, and local approvals or permits necessary to begin physical construction; and either:

(A) A continuous onsite, physical construction program has begun; or

(B) The owner or operator has entered into contractual obligations—which cannot be canceled or modified without substantial loss—for physical construction of the facility to be completed within a reasonable time.

(iii) If a boiler or industrial furnace is located at a facility that already has a permit or interim status, then the facility must comply with the applicable regulations dealing with permit modifications in 270.42 or changes in interim status in 270.72 of this chapter.

(2) Exemptions. The requirements of this section do not apply to hazardous waste and facilities exempt under 266.100(b), or 266.108.

(3) Prohibition on burning dioxin-listed wastes. The following hazardous waste listed for dioxin and hazardous waste derived from any of these wastes may not be burned in a boiler or industrial furnace operating under interim status: F020, F021, F022, F023, F026, and F027.

(4) Applicability of part 265 standards. Owners and operators of boilers and industrial furnaces that burn hazardous waste and are operating under interim status are subject to the following provisions of part 265 of this chapter, except as provided otherwise by this section:

(i) In subpart A (General), 265.4;

(ii) In subpart B (General facility standards), 265.11 through 265.17;

(iii) In subpart C (Preparedness and prevention), 265.31 through 265.37;

(iv) In subpart D (Contingency plan and emergency procedures), 265.51 through 265.56;

(v) In subpart E (Manifest system, recordkeeping, and reporting), 265.71 through 265.77, except that 265.71, 265.72, and 265.76 do not apply to owners and operators of onsite facilities that do not receive any hazardous waste from offsite sources;

(vi) In subpart G (Closure and postclosure), 265.111 through 265.115;

(vii) In subpart H (Financial requirements), 265.141, 265.142, 265.143, and 265.147 through 265.150, except that States and the Federal government are exempt from the requirements of subpart H; and

(viii) Subpart BB (Air emission standards for equipment leaks), except 265.1050(a).

(5) Special requirements for furnaces. The following controls apply during interim status to industrial furnaces (e.g., kilns, cupolas) that feed hazardous waste for a purpose other than solely as an ingredient (see paragraph (a)(5)(ii) of this section) at any location other than the hot end where products are normally discharged or where fuels are normally fired:

(i) Controls.

(A) The hazardous waste shall be fed at a location where combustion gas temperatures are at least 1800 °F;

(B) The owner or operator must determine that adequate oxygen is present in combustion gases to combust organic constituents in the waste and retain documentation of such determination in the facility record;

(C) For cement kiln systems, the hazardous waste shall be fed into the kiln; and

(D) The hydrocarbon controls of 266.104(c) or paragraph (c)(5) of this section apply upon certification of compliance under paragraph (c) of this section irrespective of the CO level achieved during the compliance test.

(ii) Burning hazardous waste solely as an ingredient. A hazardous waste is burned for a purpose other than solely as an ingredient if it meets either of these criteria:

(A) The hazardous waste has a total concentration of nonmetal compounds listed in part 261, appendix VIII, of this chapter exceeding 500 ppm by weight, as-fired, and so, is considered to be burned for destruction. The concentration of nonmetal compounds in a waste as-generated may be reduced to the 500 ppm limit by bona fide treatment that removes or destroys nonmetal 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 facility record; or

(B) 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 to augment the heating value to meet the 5,000 Btu/lb limit is prohibited and documentation that the waste has not been impermissibly blended must be retained in the facility record.

(6) Restrictions on burning hazardous waste that is not a fuel. Prior to certification of compliance under paragraph (c) of this section, owners and operators shall not feed hazardous waste (other than hazardous waste burned solely as an ingredient) in a boiler or industrial furnace that has a heating value less than 5,000 Btu/lb, as-generated, (except that the heating value of a waste as-generated may be increased to above the 5,000 Btu/lb limit by bona fide treatment; however, blending to augment the heating value to meet the 5,000 Btu/lb limit is prohibited and records must be kept to document that impermissible blending has not occurred) in a boiler or industrial furnace, except that:

(i) Hazardous waste may be burned solely as an ingredient; or

(ii) Hazardous waste may be burned for purposes of compliance testing (or testing prior to compliance testing) for a total period of time not to exceed 720 hours; or

(iii) Such waste may be burned if the Department has documentation to show that, prior to August 21, 1991:

(A) The boiler or industrial furnace is operating under the interim status standards for incinerators provided by subpart O of part 265 of this chapter, or the interim status standards for thermal treatment units provided by subpart P of part 265 of this chapter; and

(B) The boiler or industrial furnace met the interim status eligibility requirements under 270.70 of this chapter for subpart O or subpart P of part 265 of this chapter; and

(C) Hazardous waste with a heating value less than 5,000 Btu/lb was burned prior to that date; or

(iv) Such waste may be burned in a halogen acid furnace if the waste was burned as an excluded ingredient under 261.2(e) of this chapter prior to February 21, 1991 and documentation is kept on file supporting this claim.

(7) Direct transfer to the burner. If hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit, the owner and operator must comply with 266.111.

(b) Certification of precompliance-

(1) General. The owner or operator must provide complete and accurate information specified in paragraph (b)(2) of this section to the Department on or before August 21, 1991, and must establish limits for the operating parameters specified in paragraph (b)(3) of this section. Such information is termed a "certification of precompliance" and constitutes a certification that the owner or operator has determined that, when the facility is operated within the limits specified in paragraph (b)(3) of this section, the owner or operator believes that, using best engineering judgment, emissions of particulate matter, metals, and HCl and Cl₂ are not likely to exceed the limits provided by 266.105, 266.106, and 266.107. The facility may burn hazardous waste only under the operating conditions that the owner or operator establishes under paragraph (b)(3) of this section until the owner or operator submits a revised certification of precompliance under paragraph (b)(8) of this section or a certification of compliance under paragraph (c) of this section, or until a permit is issued.

(2) Information required. The following information must be submitted with the certification of precompliance to support the determination that the limits established for the operating parameters

identified in paragraph (b)(3) of this section are not likely to result in an exceedance of the allowable emission rates for particulate matter, metals, and HCl and Cl₂:

(i) General facility information:

(A) EPA facility ID number;

(B) Facility name, contact person, telephone number, and address;

(C) Description of boilers and industrial furnaces burning hazardous waste, including type and capacity of device;

(D) A scaled plot plan showing the entire facility and location of the boilers and industrial furnaces burning hazardous waste; and

(E) A description of the air pollution control system on each device burning hazardous waste, including the temperature of the flue gas at the inlet to the particulate matter control system.

(ii) Except for facilities complying with the Tier I or Adjusted Tier I feed rate screening limits for metals or total chlorine and chloride provided by 266.106 (b) or (e) and 266.107 (b)(1) or (e), respectively, the estimated uncontrolled (at the inlet to the air pollution control system) emissions of particulate matter, each metal controlled by 266.106, and hydrogen chloride and chlorine, and the following information to support such determinations:

(A) The feed rate (lb/hr) of ash, chlorine, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium in each feedstream (hazardous waste, other fuels, industrial furnace feedstocks);

(B) The estimated partitioning factor to the combustion gas for the materials identified in paragraph (b)(2)(ii)(A) of this section and the basis for the estimate and an estimate of the partitioning to HCl and Cl₂ of total chloride and chlorine in feed materials. To estimate the partitioning factor, the owner or operator must use either best engineering judgment or the procedures specified in appendix IX of this part.

(C) For industrial furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions standards under paragraph (c)(3)(ii)(A), the estimated enrichment factor for each metal. To estimate the enrichment factor, the owner or operator must use either best engineering judgment or the procedures specified in "Alternative Methodology for Implementing Metals Controls" in appendix IX of this part.

(D) If best engineering judgment is used to estimate partitioning factors or enrichment factors under paragraphs (b)(2)(ii)(B) or (b)(2)(ii)(C) respectively, the basis for the judgment. When best engineering judgment is used to develop or evaluate data or information and make determinations under this section, the determinations must be made by a qualified, registered professional engineer and a certification of his/her determinations in accordance with 270.11(d) of this chapter must be provided in the certification of precompliance.

(iii) For facilities complying with the Tier I or Adjusted Tier I feed rate screening limits for metals or total chlorine and chloride provided by 266.106 (b) or (e) and 266.107 (b)(1) or (e), the feed rate (lb/hr) of total chloride and chlorine, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium in each feedstream (hazardous waste, other fuels, industrial furnace feedstocks).

(iv) For facilities complying with the Tier II or Tier III emission limits for metals or HCl and Cl₂ (under 266.106 (c) or (d) or 266.107(b)(2) or (c)), the estimated controlled (outlet of the air pollution control system) emissions rates of particulate matter, each metal controlled by 266.106, and HCl and Cl₂, and the following information to support such determinations:

(A) The estimated air pollution control system (APCS) removal efficiency for particulate matter, HCl, Cl₂, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium.

(B) To estimate APCS removal efficiency, the owner or operator must use either best engineering judgment or the procedures prescribed in appendix IX of this part.

(C) If best engineering judgment is used to estimate APCS removal efficiency, the basis for the judgment. Use of best engineering judgment must be in conformance with provisions of paragraph (b)(2)(ii)(D) of this section.

(v) Determination of allowable emissions rates for HCl, Cl₂, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium, and the following information to support such determinations:

(A) For all facilities:

- (1) Physical stack height;
- (2) Good engineering practice stack height as defined by 40 CFR 51.100(ii);
- (3) Maximum flue gas flow rate;
- (4) Maximum flue gas temperature;
- (5) Attach a US Geological Service topographic map (or equivalent) showing the facility location and surrounding land within 5 km of the facility;
- (6) Identify terrain type: complex or noncomplex; and
- (7) Identify land use: urban or rural.

(B) For owners and operators using Tier III site specific dispersion modeling to determine allowable levels under 266.106(d) or 266.107(c), or adjusted Tier I feed rate screening limits under 266.106(e) or 266.107(e):

- (1) Dispersion model and version used;
- (2) Source of meteorological data;
- (3) The dilution factor in micrograms per cubic meter per gram per second of emissions for the maximum annual average offsite (unless onsite is required) ground level concentration (MEI location); and
- (4) Indicate the MEI location on the map required under paragraph (b)(2)(v)(A)(5);

(vi) For facilities complying with the Tier II or III emissions rate controls for metals or HCl and Cl₂, a comparison of the estimated controlled emissions rates determined under paragraph (b)(2)(iv) with the allowable emission rates determined under paragraph (b)(2)(v);

(vii) For facilities complying with the Tier I (or adjusted Tier I) feed rate screening limits for metals or total chloride and chlorine, a comparison of actual feed rates of each metal and total chlorine and chloride determined under paragraph (b)(2)(iii) of this section to the Tier I allowable feed rates; and

(viii) For industrial furnaces that feed hazardous waste for any purpose other than solely as an ingredient (as defined by paragraph (a)(5)(ii) of this section) at any location other than the product discharge end of the device, documentation of compliance with the requirements of paragraphs (a)(5)(i) (A), (B), and (C) of this section.

(ix) For industrial furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions standards under paragraph (c)(3)(ii) (A) of this section:

- (A) The applicable particulate matter standard in lb/hr; and
- (B) The precompliance limit on the concentration of each metal in collected PM.

(3) Limits on operating conditions. The owner and operator shall establish limits on the following parameters consistent with the determinations made under paragraph (b)(2) of this section and certify (under provisions of paragraph (b)(9) of this section) to the Department that the facility will operate within the limits during interim status when there is hazardous waste in the unit until revised certification of precompliance under paragraph (b)(8) of this section or certification of compliance under paragraph (c) of this section:

(i) Feed rate of total hazardous waste and (unless complying with the Tier I or adjusted Tier I metals feed rate screening limits under 266.106(b) or (e)) pumpable hazardous waste;

(ii) Feed rate of each metal in the following feed streams:

(A) Total feed streams, except that industrial furnaces that comply with the alternative metals implementation approach under paragraph (b)(4) of this section must specify limits on the concentration of each metal in collected particulate matter in lieu of feed rate limits for total feedstreams;

(B) Total hazardous waste feed, unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106 (b) or (e); and

(C) Total pumpable hazardous waste feed, unless complying with the Tier I or adjusted Tier I metals feed rate screening limits under 266.106 (b) or (e);

(iii) Total feed rate of chlorine and chloride in total feed streams;

(iv) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light weight aggregate kilns is not limited; and

(v) Maximum production rate of the device in appropriate units when producing normal product, unless complying with the Tier I or Adjusted Tier I feed rate screening limits for chlorine under section 266.107 (b)(1) or (e) and for all metals under section 266.106 (b) or (e), and the uncontrolled particulate emissions do not exceed the standard under section 266.105.

(4) Operating requirements for furnaces that recycle PM. Owners and operators of furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions controls under paragraph (c)(3)(ii)(A) of this section must comply with the special operating requirements provided in "Alternative Methodology for Implementing Metals Controls" in appendix IX of this part.

(5) Measurement of feed rates and production rate-

(i) General requirements. Limits on each of the parameters specified in paragraph (b)(3) of this section (except for limits on metals concentrations in collected particulate matter (PM) for industrial furnaces that recycle collected PM) shall be established and continuously monitored under either of the following methods:

(A) Instantaneous limits. A limit for a parameter may be established and continuously monitored and recorded on an instantaneous basis (i.e., the value that occurs at any time) not to be exceeded at any time; or

(B) Hourly rolling average limits. A limit for a parameter may be established and continuously monitored on an hourly rolling average basis defined as follows:

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

(ii) Rolling average limits for carcinogenic metals and lead. Feed rate limits for the carcinogenic metals (arsenic, beryllium, cadmium, and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (b)(5)(i)(B) or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an averaging 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 the preceding clock hour.

(iii) Feed rate limits for metals, total chloride and chlorine, and ash. Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored by knowing 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 (b)(5) (i) and (ii) of this section.

(6) Public notice requirements at precompliance. On or before August 21, 1991 the owner or operator must submit a notice with the following information for publication in a major local newspaper of general circulation and send a copy of the notice to the appropriate units of State and local government. The owner and operator must provide to the Department with the certification of precompliance evidence of submitting the notice for publication. The notice, which shall be entitled "Notice of Certification of Precompliance with Hazardous Waste Burning Requirements of 266.103(b)", must include:

(i) Name and address of the owner and operator of the facility as well as the location of the device burning hazardous waste;

(ii) Date that the certification of precompliance is submitted to the Department;

(iii) Brief description of the regulatory process required to comply with the interim status requirements of this section including required emissions testing to demonstrate conformance with emissions standards for organic compounds, particulate matter, metals, and HCl and Cl₂;

(iv) Types and quantities of hazardous waste burned including, but not limited to, source, whether solids or liquids, as well as an appropriate description of the waste;

(v) Type of device(s) in which the hazardous waste is burned including a physical description and maximum production rate of each device;

(vi) Types and quantities of other fuels and industrial furnace feedstocks fed to each unit;

(vii) Brief description of the basis for this certification of precompliance as specified in paragraph (b)(2) of this section;

(viii) Locations where the operating record for the facility can be viewed and copied by interested parties. These records and locations shall at a minimum include:

(A) The administrative record kept by the Department office where the supporting documentation was submitted or another location designated by the Department; and

(B) The BIF correspondence file kept at the facility site where the device is located. The correspondence file must include all correspondence between the facility and the Director, state and local regulatory officials, including copies of all certifications and notifications, such as the precompliance certification, precompliance public notice, notice of compliance testing, compliance test report, compliance certification, time extension requests and approvals or denials, enforcement notifications of violations, and copies of EPA and State site visit reports submitted to the owner or operator.

(ix) Notification of the establishment of a facility mailing list whereby interested parties shall notify the Department that they wish to be placed on the mailing list to receive future information and notices about this facility; and

(x) Location (mailing address of the applicable office where further information can be obtained on regulation of hazardous waste burning.

(7) Monitoring other operating parameters. When the monitoring systems for the operating parameters listed in paragraphs (c)(1)(v through xiii) of this section are installed and operating in conformance with vendor specifications or (for CO, HC, and oxygen) specifications provided by appendix IX of this part, as appropriate, the parameters shall be continuously monitored and records shall be maintained in the operating record.

(8) Revised certification of precompliance. The owner or operator may revise at any time the information and operating conditions documented under paragraphs (b)(2) and (b)(3) of this section in the certification of precompliance by submitting a revised certification of precompliance under procedures provided by those paragraphs.

(i) The public notice requirements of paragraph (b)(6) of this section do not apply to recertifications.

(ii) The owner and operator must operate the facility within the limits established for the operating parameters under paragraph (b)(3) of this section until a revised certification is submitted under this paragraph or a certification of compliance is submitted under paragraph (c) of this section.

(9) Certification of precompliance statement. The owner or operator must include the following signed statement with the certification of precompliance submitted to the Department:

“I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information and supporting documentation. Copies of all emissions tests, dispersion modeling results and other information used to determine conformance with the requirements of 266.103(b) are available at the facility and can be obtained from the facility contact person listed above. Based on my inquiry of the person or persons who manages the facility, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also acknowledge that the operating limits established in this certification pursuant to 266.103(b) (3) and (4) are enforceable limits at which the facility can legally operate during interim status until: (1) A revised certification of precompliance is submitted, (2) a certification of compliance is submitted, or (3) an operating permit is issued.”

(c) Certification of compliance. The owner or operator shall conduct emissions testing to document compliance with the emissions standards of 266.104 (b) through (e), 266.105, 266.106, 266.107, and paragraph (a)(5)(i)(D) of this section, under the procedures prescribed by this paragraph, except under extensions of time provided by paragraph (c)(7). Based on the compliance test, the owner or operator shall submit to the Department on or before August 21, 1992 a complete and accurate “certification of compliance” (under paragraph (c)(4) of this section) with those emission standards establishing limits on the operating parameters specified in paragraph (c)(1).

(1) Limits on operating conditions. The owner or operator shall establish limits on the following parameters based on operations during the compliance test (under procedures prescribed in paragraph (c)(4)(iv) of this section) or as otherwise specified and include these limits with the certification of compliance. The boiler or industrial furnace must be operated in accordance with these operating limits and the applicable emissions standards of sections 266.104(b) through (e), 266.105, 266.106, 266.107, and 266.103(a)(5)(i)(D) at all times when there is hazardous waste in the unit.

(i) Feed rate of total hazardous waste and (unless complying with the Tier I or adjusted Tier I metals feed rate screening limits under 266.106(b) or (e)), pumpable hazardous waste; (revised 12/93; 5/96)

(ii) Feed rate of each metal in the following feedstreams:

(A) Total feedstreams, except that:

(1) Facilities that comply with Tier I or Adjusted Tier I metals feed rate screening limits may set their operating limits at the metals feed rate screening limits determined under 266.106(b) or (e); and

(2) Industrial furnaces that must comply with the alternative metals implementation approach under paragraph (c)(3)(ii) of this section must specify limits on the concentration of each metal in the collected particulate matter in lieu of feed rate limits for total feedstreams;

(B) Total hazardous waste feed (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106 (b) or (e)); and

(C) Total pumpable hazardous waste feed (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under sections 266.106(b) or (e));

(iii) Total feed rate of chlorine and chloride in total feed streams, except that facilities that comply with Tier I or Adjusted Tier I feed rate screening limits may set their operating limits at the total chlorine and chloride feed rate screening limits determined under 266.107(b)(1) or (e);

(iv) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light weight aggregate kilns is not limited;

(v) Carbon monoxide concentration, and where required, hydrocarbon concentration in stack gas. When complying with the CO controls of 266.104(b), the CO limit is 100 ppmv, and when

complying with the HC controls of 266.104(c), the HC limit is 20 ppmv. When complying with the CO controls of 266.104(c), the CO limit is established based on the compliance test;

(vi) Maximum production rate of the device in appropriate units when producing normal product, unless complying with the Tier I or Adjusted Tier I feed rate screening limits for chlorine under section 266.107(b)(1) or (e) and for all metals under section 266.106(b) or (e), and the uncontrolled particulate emissions do not exceed the standard under section 266.105;

(vii) Maximum combustion chamber temperature where the temperature measurement is as close to the combustion zone as possible and is upstream of any quench water injection (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e));

(viii) Maximum flue gas temperature entering a particulate matter control device (unless complying with Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b) or (e));

(ix) For systems using wet scrubbers, including wet ionizing scrubbers (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b)(1) or (e)) (Note: SC regs includes all of the above except needs to add "the" before "Tier I...");

(A) Minimum liquid to flue gas ratio;

(B) Minimum scrubber blowdown from the system or maximum suspended solids content of scrubber water; and

(C) Minimum pH level of the scrubber water;

(x) For systems using venturi scrubbers, the minimum differential gas pressure across the venturi (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b)(1) or (e));

(xi) For systems using dry scrubbers (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b)(1) or (e));

(A) Minimum caustic feed rate; and

(B) Maximum flue gas flow rate;

(xii) For systems using wet ionizing scrubbers or electrostatic precipitators (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b)(1) or (e));

(A) Minimum electrical power in kilovolt amperes (kVA) to the precipitator plates; and

(B) Maximum flue gas flow rate;

(xiii) For systems using fabric filters (baghouses), the minimum pressure drop (unless complying with the Tier I or Adjusted Tier I metal feed rate screening limits under 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under 266.107(b)(1) or (e)).

(2) Prior notice of compliance testing. At least 30 days prior to the compliance testing required by paragraph (c)(3) of this section, the owner or operator shall notify the Department and submit the following information:

(i) General facility information including:

(A) EPA facility ID number;

(B) Facility name, contact person, telephone number, and address;

(C) Person responsible for conducting compliance test, including company name, address, and telephone number, and a statement of qualifications;

(D) Planned date of the compliance test;

(ii) Specific information on each device to be tested including:

(A) Description of boiler or industrial furnace;

(B) A scaled plot plan showing the entire facility and location of the boiler or industrial furnace;

(C) A description of the air pollution control system;

(D) Identification of the continuous emission monitors that are installed, including:

(1) Carbon monoxide monitor;

(2) Oxygen monitor;

(3) Hydrocarbon monitor, specifying the minimum temperature of the system and, if the temperature is less than 150 °C, an explanation of why a heated system is not used (see paragraph (c)(5) of this section) and a brief description of the sample gas conditioning system;

(E) Indication of whether the stack is shared with another device that will be in operation during the compliance test;

(F) Other information useful to an understanding of the system design or operation.

(iii) Information on the testing planned, including a complete copy of the test protocol and Quality Assurance/Quality Control (QA/QC) plan, and a summary description for each test providing the following information at a minimum:

(A) Purpose of the test (e.g., demonstrate compliance with emissions of particulate matter); and

(B) Planned operating conditions, including levels for each pertinent parameter specified in paragraph (c)(1) of this section.

(3) Compliance testing.-

(i) General. Compliance testing must be conducted under conditions for which the owner or operator has submitted a certification of precompliance under paragraph (b) of this section and under conditions established in the notification of compliance testing required by paragraph (c)(2) of this section. The owner or operator may seek approval on a case-by-case basis to use compliance test data from one unit in lieu of testing a similar onsite unit. To support the request, the owner or operator must provide a comparison of the hazardous waste burned and other feedstreams, and the design, operation, and maintenance of both the tested unit and the similar unit. The Department shall provide a written approval to use compliance test data in lieu of testing a similar unit if he finds that the hazardous wastes, the devices, and the operating conditions are sufficiently similar, and the data from the other compliance test is adequate to meet the requirements of 266.103(c).

(ii) Special requirements for industrial furnaces that recycle collected PM. Owners and operators of industrial furnaces that recycle back into the furnace particulate matter (PM) from the air pollution control system must comply with one of the following procedures for testing to determine compliance with the metals standards of 266.106(c) or (d):

(A) The special testing requirements prescribed in "Alternative Method for Implementing Metals Controls" in appendix IX of this part; or

(B) Stack emissions testing for a minimum of 6 hours each day while hazardous waste is burned during interim status. The testing must be conducted when burning normal hazardous waste for that day at normal feed rates for that day and when the air pollution control system is operated under normal conditions. During interim status, hazardous waste analysis for metals content must be sufficient for the owner or operator to determine if changes in metals content may affect the ability of the facility to meet the metals emissions standards established under 266.106(c) or (d). Under this option, operating limits (under paragraph (c)(1) of this section) must be established during compliance testing under paragraph (c)(3) of this section only on the following parameters:

(1) Feed rate of total hazardous waste;

(2) Total feed rate of chlorine and chloride in total feed streams;

(3) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light weight aggregate kilns is not limited;

(4) Carbon monoxide concentration, and where required, hydrocarbon concentration in stack gas;

(5) Maximum production rate of the device in appropriate units when producing normal product; or

(C) Conduct compliance testing to determine compliance with the metals standards to establish limits on the operating parameters of paragraph (c)(1) of this section only after the kiln system has been conditioned to enable it to reach equilibrium with respect to metals fed into the system and metals emissions. During conditioning, hazardous waste and raw materials having the same metals content as will be fed during the compliance test must be fed at the feed rates that will be fed during the compliance test.

(iii) Conduct of compliance testing.

(A) If compliance with all applicable emissions standards of 266.104 through 266.107 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 as close as possible to the original operating conditions.

(B) Prior to obtaining test data for purposes of demonstrating compliance with the applicable emissions standards of 266.104 through 266.107 or establishing limits on operating parameters under this section, the facility must operate under compliance test conditions for a sufficient period to reach steady-state operations. Industrial furnaces that recycle collected particulate matter back into the furnace and that comply with paragraphs (c)(3)(ii)(A) or (B) of this section, however, need not reach steady state conditions with respect to the flow of metals in the system prior to beginning compliance testing for metals.

(C) Compliance test data on the level of an operating parameter for which a limit must be established in the certification of compliance must be obtained during emissions sampling for the pollutant(s) (i.e., metals, PM, HCl/Cl₂, organic compounds) for which the parameter must be established as specified by paragraph (c)(1) of this section.

(4) Certification of compliance. Within 90 days of completing compliance testing, the owner or operator must certify to the Department compliance with the emissions standards of 266.104(b), (c), and (e), 266.105, 266.106, 266.107, and paragraph (a)(5)(i)(D) of this section. The certification of compliance must include the following information:

(i) General facility and testing information including:

(A) EPA facility ID number;

(B) Facility name, contact person, telephone number, and address;

(C) Person responsible for conducting compliance testing, including company name, address, and telephone number, and a statement of qualifications;

(D) Date(s) of each compliance test;

(E) Description of boiler or industrial furnace tested;

(F) Person responsible for quality assurance/quality control (QA/QC), title, and telephone number, and statement that procedures prescribed in the QA/QC plan submitted under 266.103(c)(2)(iii) have been followed, or a description of any changes and an explanation of why changes were necessary.

(G) Description of any changes in the unit configuration prior to or during testing that would alter any of the information submitted in the prior notice of compliance testing under paragraph (c)(2) of this section, and an explanation of why the changes were necessary;

(H) Description of any changes in the planned test conditions prior to or during the testing that alter any of the information submitted in the prior notice of compliance testing under paragraph (c)(2) of this section, and an explanation of why the changes were necessary; and

(I) The complete report on results of emissions testing.

(ii) Specific information on each test including:

(A) Purpose(s) of test (e.g., demonstrate conformance with the emissions limits for particulate matter, metals, HCl, Cl₂, and CO)

(B) Summary of test results for each run and for each test including the following information:

- (1) Date of run;
- (2) Duration of run;
- (3) Time-weighted average and highest hourly rolling average CO level for each run and for the test;
- (4) Highest hourly rolling average HC level, if HC monitoring is required for each run and for the test;
- (5) If dioxin and furan testing is required under 266.104(e), time-weighted average emissions for each run and for the test of chlorinated dioxin and furan emissions, and the predicted maximum annual average ground level concentration of the toxicity equivalency factor;
- (6) Time-weighted average particulate matter emissions for each run and for the test;
- (7) Time-weighted average HCl and Cl₂ emissions for each run and for the test;
- (8) Time-weighted average emissions for the metals subject to regulation under 266.106 for each run and for the test; and
- (9) QA/QC results.

(iii) Comparison of the actual emissions during each test with the emissions limits prescribed by 266.104 (b), (c), and (e), 266.105, 266.106, and 266.107 and established for the facility in the certification of precompliance under paragraph (b) of this section.

(iv) Determination of operating limits based on all valid runs of the compliance test for each applicable parameter listed in paragraph (c)(1) of this section using 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 operating limit specified as the time-weighted average during all runs of the compliance test; or

(B) Hourly rolling average basis.

(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 operating limit for the parameter shall be established based on compliance test data as the average over all test runs of the highest hourly rolling average value for each run.

(C) Rolling average limits for carcinogenic metals and lead. Feed rate limits for the carcinogenic metals (i.e., arsenic, beryllium, cadmium and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (c)(4)(iv)(B) of this section or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an averaging period from 2 to 24 hours:

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

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

(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) The rolling average for the selected averaging period is defined as 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

(3) The operating limit for the feed rate of each metal shall be established based on compliance test data as the average over all test runs of the highest hourly rolling average feed rate for each run.

(D) Feed rate limits for metals, total chloride and chlorine, and ash. Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored by knowing 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)(4)(iv) (A) through (C) of this section.

(v) Certification of compliance statement. The following statement shall accompany the certification of compliance:

“I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information and supporting documentation. Copies of all emissions tests, dispersion modeling results and other information used to determine conformance with the requirements of 266.103(c) are available at the facility and can be obtained from the facility contact person listed above. Based on my inquiry of the person or persons who manages the facility, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also acknowledge that the operating conditions established in this certification pursuant to 266.103(c)(4)(iv) are enforceable limits at which the facility can legally operate during interim status until a revised certification of compliance is submitted.”

(5) Special requirements for HC monitoring systems. When an owner or operator is required to comply with the hydrocarbon (HC) controls provided by 266.104(c) or paragraph (a)(5)(i)(D) of this section, a conditioned gas monitoring system may be used in conformance with specifications provided in appendix IX of this part provided that the owner or operator submits a certification of compliance without using extensions of time provided by paragraph (c)(7) of this section. However, owners and operators of facilities electing to comply with the alternative hydrocarbon provision of 266.104(f) and requesting a time extension under 266.103(c)(7)(ii)(B) may establish the baseline HC level and comply with the interim HC limit established by the time extension using a conditioned gas monitoring system if the Director determines that the owner or operator has demonstrated that they have made a good faith effort to operate a heated monitoring system but found it to be impracticable.

(6) Special operating requirements for industrial furnaces that recycle collected PM. Owners and operators of industrial furnaces that recycle back into the furnace particulate matter (PM) from the air pollution control system must:

(i) When complying with the requirements of paragraph (c)(3)(ii)(A) of this section, comply with the operating requirements prescribed in “Alternative Method to Implement the Metals Controls” in appendix IX of this part; and

(ii) When complying with the requirements of paragraph (c)(3)(ii)(B) of this section, comply with the operating requirements prescribed by that paragraph.

(7) Extensions of time.

(i) If the owner or operator does not submit a complete certification of compliance for all of the applicable emissions standards of 266.104, 266.105, 266.106, and 266.107 by August 21, 1992, he/she must either:

(A) Stop burning hazardous waste and begin closure activities under paragraph (l) of this section for the hazardous waste portion of the facility; or

(B) Limit hazardous waste burning only for purposes of compliance testing (and pretesting to prepare for compliance testing) a total period of 720 hours for the period of time beginning

August 21, 1992, submit a notification to the Department by August 21, 1992 stating that the facility is operating under restricted interim status and intends to resume burning hazardous waste, and submit a complete certification of compliance by August 23, 1993; or

(C) Obtain a case-by-case extension of time under paragraph (c)(7)(ii) of this section.

(ii) The owner or operator may request a case-by-case extension of time to extend any time limit provided by paragraph (c) of this section if compliance with the time limit is not practicable for reasons beyond the control of the owner or operator.

(A) In granting an extension, the Department may apply conditions as the facts warrant to ensure timely compliance with the requirements of this section and that the facility operates in a manner that does not pose a hazard to human health and the environment;

(B) When an owner or operator requests an extension of time to enable the facility to comply with the alternative hydrocarbon provisions of 266.104(f) and obtain a RCRA operating permit because the facility cannot meet the HC limit of 266.104(c) of this chapter:

(1) The Department shall, in considering whether to grant the extension:

(i) Determine whether the owner and operator have submitted in a timely manner a complete part B permit application that includes information required under 270.22(b) of this chapter; and

(ii) Consider whether the owner and operator have made a good faith effort to certify compliance with all other emission controls, including the controls on dioxins and furans of 266.104(e) and the controls on PM, metals, and HCl/Cl₂.

(2) If an extension is granted, the Department shall, as a condition of the extension, require the facility to operate under flue gas concentration limits on CO and HC that, based on available information, including information in the part B permit application, are baseline CO and HC levels as defined by 266.104(f)(1).

(8) Revised certification of compliance. The owner or operator may submit at any time a revised certification of compliance (recertification of compliance) under the following procedures:

(i) Prior to submittal of a revised certification of compliance, hazardous waste may not be burned for more than a total of 720 hours under operating conditions that exceed those established under a current certification of compliance, and such burning may be conducted only for purposes of determining whether the facility can operate under revised conditions and continue to meet the applicable emissions standards of 266.104, 266.105, 266.106, and 266.107;

(ii) At least 30 days prior to first burning hazardous waste under operating conditions that exceed those established under a current certification of compliance, the owner or operator shall notify the Department and submit the following information:

(A) EPA facility ID number, and facility name, contact person, telephone number, and address;

(B) Operating conditions that the owner or operator is seeking to revise and description of the changes in facility design or operation that prompted the need to seek to revise the operating conditions;

(C) A determination that when operating under the revised operating conditions, the applicable emissions standards of 266.104, 266.105, 266.106, and 266.107 are not likely to be exceeded. To document this determination, the owner or operator shall submit the applicable information required under paragraph (b)(2) of this section; and

(D) Complete emissions testing protocol for any pretesting and for a new compliance test to determine compliance with the applicable emissions standards of 266.104, 266.105, 266.106, and 266.107 when operating under revised operating conditions. The protocol shall include a schedule of pretesting and compliance testing. If the owner and operator revises the scheduled date for the compliance test, he/she shall notify the Department in writing at least 30 days prior to the revised date of the compliance test;

(iii) Conduct a compliance test under the revised operating conditions and the protocol submitted to the Department to determine compliance with the applicable emissions standards of 266.104, 266.105, 266.106, and 266.107; and

(iv) Submit a revised certification of compliance under paragraph (c)(4) of this section.

(d) Periodic Recertifications. The owner or operator must conduct compliance testing and submit to the Department a recertification of compliance under provisions of paragraph (c) of this section within five years from submitting the previous certification or recertification. If the owner or operator seeks to recertify compliance under new operating conditions, he/she must comply with the requirements of paragraph (c)(8) of this section.

(e) Noncompliance with certification schedule. If the owner or operator does not comply with the interim status compliance schedule provided by paragraphs (b), (c), and (d) of this section, hazardous waste burning must terminate on the date that the deadline is missed, closure activities must begin under paragraph (l) of this section, and hazardous waste burning may not resume except under an operating permit issued under 270.66 of this chapter. For purposes of compliance with the closure provisions of paragraph (l) of this section and 265.112(d)(2) and 265.113 of this chapter the boiler or industrial furnace has received "the known final volume of hazardous waste" on the date that the deadline is missed.

(f) Startup and shutdown. 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 during startup and shutdown of the boiler or industrial furnace, unless the device is operating within the conditions of operation specified in the certification of compliance.

(g) Automatic waste feed cutoff. During the compliance test required by paragraph (c)(3) of this section, and upon certification of compliance under paragraph (c) of this section, a boiler or industrial furnace must be operated with a functioning system that automatically cuts off the hazardous waste feed when the applicable operating conditions specified in paragraphs (c)(1) (i) and (v through xiii) of this section deviate from those established in the certification of compliance. In addition:

(1) To minimize emissions of organic compounds, the minimum combustion chamber temperature (or the indicator of combustion chamber temperature) that occurred during the compliance test must be maintained while hazardous waste or hazardous waste residues remain in the combustion chamber, with the minimum temperature during the compliance test defined as either:

(i) If compliance with the combustion chamber temperature limit is based on an hourly rolling average, the minimum temperature during the compliance test is considered to be the average over all runs of the lowest hourly rolling average for each run; or

(ii) If compliance with the combustion chamber temperature limit is based on an instantaneous temperature measurement, the minimum temperature during the compliance test is considered to be the time-weighted average temperature during all runs of the test; and

(2) Operating parameters limited by the certification of compliance 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 limits established in the certification of compliance.

(h) Fugitive emissions. Fugitive emissions must be controlled by:

(1) Keeping the combustion zone totally sealed against fugitive emissions; or

(2) Maintaining the combustion zone pressure lower than atmospheric pressure; or

(3) An alternate means of control that the owner or operator can demonstrate provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure. Support for such demonstration shall be included in the operating record.

(i) Changes. A 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 boiler or industrial furnace design or operating conditions deviate from the limits specified in the certification of compliance.

(j) Monitoring and Inspections.

(1) The owner or operator must monitor and record the following, at a minimum, while burning hazardous waste:

(i) Feed rates and composition of hazardous waste, other fuels, and industrial furnace feed stocks, and feed rates of ash, metals, and total chloride and chlorine as necessary to ensure conformance with the certification of precompliance or certification of compliance;

(ii) Carbon monoxide (CO), oxygen, and if applicable, hydrocarbons (HC), on a continuous basis at a common point in the boiler or industrial furnace downstream of the combustion zone and prior to release of stack gases to the atmosphere in accordance with the operating limits specified in the certification of compliance. CO, HC, and oxygen monitors must be installed, operated, and maintained in accordance with methods specified in Appendix IX of this part.

(iii) Upon the request of the Department, sampling and analysis of the hazardous waste (and other fuels and industrial furnace feed stocks as appropriate) and the stack gas emissions must be conducted to verify that the operating conditions established in the certification of precompliance or certification of compliance achieve the applicable standards of 266.104, 266.105, 266.106, and 266.107.

(2) The boiler or industrial furnace and associated equipment (pumps, valves, pipes, fuel storage tanks, etc.) must be subjected to thorough visual inspection when they contain hazardous waste, at least daily for leaks, spills, fugitive emissions, and signs of tampering.

(3) 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 owner or operator can demonstrate that weekly inspections will unduly restrict or upset operations and that less frequent inspections will be adequate. Support for such demonstration shall be included in the operating record. At a minimum, operational testing must be conducted at least once every 30 days.

(4) These monitoring and inspection data must be recorded and the records must be placed in the operating log.

(k) Recordkeeping. The owner or operator must keep in the operating record of the facility all information and data required by this section for five years.

(l) 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 boiler or industrial furnace and must comply with 265.111 through 265.115 of this chapter.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 32, Issue No. 6, eff June 27, 2008.

266.104. Standards to control organic emissions.

(a) DRE standard.

(1) General. Except as provided in paragraph (a)(3) of this section, a boiler 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 (a)(2) of this section) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$\text{DRE} = 1 - \frac{W_{\text{out}}}{W_{\text{in}}} \times 100$$

where:

W_{IN} = Mass feed rate of one principal organic hazardous constituent (POHC) in the hazardous waste fired to the 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 270.66 of this chapter. One or more POHCs shall be designated by the Department 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 this chapter that are also present in the

normal waste feed. However, if the applicant demonstrates to the Department 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. A 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 (a)(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 (a)(1) of this section. In addition, the owner or operator of the boiler or industrial furnace must notify the Department of intent to burn EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027.

(4) Automatic waiver of DRE trial burn. Owners and operators of boilers operated under the special operating requirements provided by 266.110 are considered to be in compliance with the DRE standard of paragraph (a)(1) of this section and are exempt from the DRE trial burn.

(5) Low risk waste. Owners and operators of boilers or industrial furnaces that burn hazardous waste in compliance with the requirements of 266.109(a) are considered to be in compliance with the DRE standard of paragraph (a)(1) of this section and are exempt from the DRE trial burn.

(b) Carbon monoxide standard.

(1) Except as provided in paragraph (c) of this section, the stack gas concentration of carbon monoxide (CO) from a 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 of this part.

(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 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 compliance test must not exceed 100 ppmv.

(c) 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 (f) 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 of this part. CO and oxygen shall be continuously monitored in conformance with paragraph (b)(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.

(d) 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 266.103(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 (c) or (f) of this section irrespective of whether stack gas CO concentrations meet the 100 ppmv limit of paragraph (b) of this section.

(e) Controls for dioxins and furans. Owners and operators of boilers and industrial furnaces that are equipped with a dry particulate matter control device that operates within the temperature range of 450 to 750 °F, and industrial furnaces operating under an alternative hydrocarbon limit established under paragraph (f) of this section must conduct a site-specific risk assessment as follows to demonstrate that emissions of chlorinated dibenzo-p-dioxins and dibenzofurans do not result in an increased lifetime cancer risk to the hypothetical maximum exposed individual (MEI) exceeding 1 in 100,000:

(1) During the trial burn (for new facilities or an interim status facility applying for a permit) or compliance test (for interim status facilities), determine emission rates of the tetra-octa congeners of chlorinated dibenzo-p-dioxins and dibenzofurans (CDDs/CDFs) using Method [241]0023A, Sampling Method for Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Polychlorinated Dibenzofurans Emissions from Stationary Sources, EPA Publication SW846, as incorporated by reference in 260.11 of this chapter.

(2) Estimate the 2,3,7,8-TCDD toxicity equivalence 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 of this part. Multiply the emission rates of CDD/CDF congeners with a toxicity equivalence greater than zero (see the procedure) by the calculated toxicity equivalence factor to estimate the equivalent emission rate of 2,3,7,8-TCDD;

(3) Conduct dispersion modeling using methods recommended in appendix W of part 51 (“Guidelines on Air Quality Models (Revised)” (1986) and its supplements), the “Hazardous Waste Combustion Air Quality Screening Procedure,” provided in appendix IX of this part, or in Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised (incorporated by reference in § 260.11) to predict the maximum annual average offsite ground level concentration of 2,3,7,8-TCDD equivalents determined under paragraph (e)(2) of this section. The maximum annual average concentration must be used when a person resides onsite; and

(4) The ratio of the predicted maximum annual average ground level concentration of 2,3,7,8-TCDD equivalents to the risk-specific dose for 2,3,7,8-TCDD provided in appendix V of this part (2.2×10^{-7}) shall not exceed 1.0.

(f) 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 (b), (c), and (d) of this section by monitoring in the by-pass duct provided that: (revised 5/96)

(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.

(g) 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 where applicable, CDD/CDF testing under paragraph (e) of this section and comprehensive organic emissions testing under paragraph (f) is conducted. (revised 5/96)

(h) Enforcement. For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under 266.102) 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 270.41 of this chapter. (revised 5/96)

(i) [Reserved]

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.105. Standards to control particulate matter.

(a) A boiler or industrial furnace burning hazardous waste may not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 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 of this part.

(b) An owner or operator meeting the requirements of 266.109(b) for the low risk waste exemption is exempt from the particulate matter standard.

(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_c is the corrected concentration of the pollutant in the stack gas, P_m 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.

(d) For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under 266.102) 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 270.41 of this chapter.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; State Register Volume 25, Issue No. 10, October 26, 2001.

266.106. Standards to control metals emissions.

(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 using analytical procedures specified in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), incorporated by reference in 260.11 of this chapter.

(b) Tier I feed rate screening limits. Feed rate screening limits for metals are specified in appendix I of this part 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, and silver in all feed streams, including hazardous waste, fuels, and industrial furnace feed stocks shall not exceed the screening limits specified in appendix I of this part.

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

(A) An hourly rolling average as defined in 266.102(e)(6)(i)(B); 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 266.102(e)(6)(i)(B);

(B) An averaging period of 2 to 24 hours as defined in 266.102(e)(6)(ii) 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 feed stocks shall not exceed values derived from the

screening limits specified in appendix I of this part. 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 shall not exceed 1.0, as provided by the following equation:

$$\sum_{i=1}^n \frac{AFR_{(i)} \leq 1.0}{FRSL_{(i)}}$$

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 part for metal "i".

(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 266.102(e)(6)(ii) 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:

$$TESH=Ha + H1-Tr$$

where:

Ha=Actual physical stack height

H1=Plume rise as determined from appendix VI of this part as a function of stack flow rate and stack gas exhaust temperature.

Tr=Terrain rise within five kilometers of the stack.

(ii) The stack height (Ha) may not exceed good engineering practice 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 (Ha) 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 of this part shall be used.

(6) Multiple stacks. Owners and operators of facilities with more than one onsite stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls of metals emissions under a 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:

$$K=HVT$$

Where:

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

H=physical stack height (meters);

V=stack gas flow rate (m³/second); and

T=exhaust temperature (°K).

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 Department determines that standards based on site-specific dispersion modeling are required.

(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 part.

(2) Carcinogenic metals. The emission rates of arsenic, cadmium, beryllium, and chromium shall not exceed values derived from the screening limits specified in Appendix I of this part. 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:

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

where:

n=number of carcinogenic metals

AER=actual emission rate for metal "i"

ERSL=emission rate screening limit provided by appendix I of this part for metal "i".

(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 compliance test (for interim status facilities). 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 266.102 or 266.103 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 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 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 assessment. The requirements of this paragraph apply to facilities complying with either the Tier III or Adjusted Tier I controls, except where specified otherwise.

(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 offsite 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 part list the acceptable ambient levels for purposes of this rule. 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 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. For the carcinogenic metals, arsenic, cadmium, beryllium, and chromium, the sum of the ratios of the predicted maximum annual average offsite ground level concentrations (except that onsite concentrations must be considered if a person resides on site) to the risk-specific dose (RSD) for all carcinogenic metals emitted shall not exceed 1.0 as determined by the following equation:

$$\sum_{i=1}^n \frac{\text{Predicted Ambient Concentration}_{(i)}}{\text{Risk-Specific Dose}_{(i)}} \leq 1.0$$

where: n=number of carcinogenic metals

(4) Noncarcinogenic metals. For the noncarcinogenic metals, the predicted maximum annual average offsite ground level concentration for each metal shall not exceed the reference air concentration (RAC).

(5) Multiple stacks. Owners and operators of facilities with more than one onsite 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 onsite 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 compliance test (for interim status facilities). 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 266.102 or 266.103 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 part 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 part 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 Department 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 part 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 provided in appendix V of this part 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 metals of the ratios of the selected emission limit to the emission rate determined by that paragraph does not exceed 1.0.

(g) Emission testing.

(1) General. Emission testing for metals shall be conducted using Method 0060, Determinations of Metals in Stack Emissions, EPA Publication SW846, as incorporated by reference in 260.11 of this chapter.

(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 Chromium Emissions from Stationary Sources, EPA Publication SW846, as incorporated by reference in 260.11 of this part.

(h) Dispersion Modeling. Dispersion modeling required under this section shall be conducted according to methods recommended in appendix W, part 51 of this chapter ("Guidelines on Air Quality Models (Revised)" (1986) and its supplements," the "Hazardous Waste Combustion Air Quality Screening Procedure," provided in appendix IX of this part, or in Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, (incorporated by reference in § 260.11) to predict the maximum annual average offsite ground level concentration. However, onsite concentration must be considered when a person resides onsite.

(i) Enforcement. For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under 266.102) 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 reissuance of a permit under 270.41 of this chapter.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

Editor's Note

Republished in 2016 to fix a typographical error.

266.107. Standards to control hydrogen chloride (HCl) and chlorine gas (Cl₂) emissions.

(a) General. The owner or operator must comply with the hydrogen chloride (HCl) and chlorine (Cl₂) controls provided by paragraph (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 part 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 feed stocks shall not exceed the levels specified.

(2) Tier II emission rate screening limits. Emission rate screening limits for HCl and Cl₂ are specified in Appendix III of this part 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 Cl₂ shall not exceed the levels specified.

(3) Definitions and limitations. The definitions and limitations provided by 266.106(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 onsite stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on HCl or Cl₂ emissions under a 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 266.106(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 Cl₂ 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 Cl₂, air dispersion modeling to predict the maximum annual average offsite ground level concentration for each compound, and a demonstration that acceptable ambient levels are not exceeded.

(2) Acceptable ambient levels. Appendix IV of this part lists the reference air concentrations (RACs) for HCl (7 micrograms per cubic meter) and Cl₂ (0.4 micrograms per cubic meter).

(3) Multiple stacks. Owners and operators of facilities with more than one onsite stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on HCl or Cl₂ emissions under a RCRA operating permit or interim status controls must conduct emissions testing and dispersion modeling to demonstrate that the aggregate emissions from all such onsite stacks do not result in an exceedance of the acceptable ambient levels for HCl and Cl₂.

(d) Averaging periods. The HCl and Cl₂ controls are implemented by limiting the feed rate of total chlorine and chloride in all feedstreams, including hazardous waste, fuels, and industrial furnace feed stocks. Under Tier I, the feed rate of total chloride and chlorine is limited to the Tier I Screening Limits. Under Tier II and Tier III, the feed rate of total chloride and chlorine is limited to the feed rates during the trial burn (for new facilities or an interim status facility applying for a permit) or the compliance test (for interim status facilities). The feed rate limits are based on either:

(1) An hourly rolling average as defined in 266.102(e)(6); 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 part 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 Cl₂ provided by Appendix IV of this part 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 Cl₂ shall be conducted using the procedures described in Methods 0050 or 0051, EPA Publication SW846, as incorporated by reference in 260.11 of this part.

(g) Dispersion modeling. Dispersion modeling shall be conducted according to the provisions of 266.106(h).

(h) Enforcement. For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under 266.102) 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 reissuance of a permit under 270.41 of this chapter.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.108. Small quantity onsite burner exemption.

(a) Exempt quantities. Owners and operators of facilities that burn hazardous waste in an onsite boiler or industrial furnace are exempt from the requirements of this subpart provided that:

(1) The quantity of hazardous waste burned in a device for a calendar month does not exceed the limits provided in the following table based on the terrain-adjusted effective stack height as defined in 266.106(b)(3):

Exempt Quantities for Small Quantity Burner Exemption

Terrain-adjusted effective stack height of device (meters)	Allowable hazardous waste burning rate (gallons/month)	Terrain-adjusted effective stack height of device (meters)	Allowable hazardous waste burning rate (gallons/month)
0 to 3.9	0	40.0 to 44.9	210
4.0 to 5.9	13	45.0 to 49.9	260
6.0 to 7.9	18	50.0 to 54.9	330
8.0 to 9.9	27	55.0 to 59.9	400
10.0 to 11.9	40	60.0 to 64.9	490
12.0 to 13.9	48	65.0 to 69.9	610
14.0 to 15.9	59	70.0 to 74.9	680
16.0 to 17.9	69	75.0 to 79.9	760
18.0 to 19.9	76	80.0 to 84.9	850
20.0 to 21.9	84	85.0 to 89.9	960
22.0 to 23.9	93	90.0 to 94.9	1100
24.0 to 25.9	100	95.0 to 99.9	1200
26.0 to 27.9	110	100.0 to 104.9	1300
28.0 to 29.9	130	105.0 to 109.9	1500
30.0 to 34.9	140	110.0 to 114.9	1700
35.0 to 39.9	170	115.0 or greater	1900

(2) The maximum hazardous waste firing rate does not exceed at any time 1 percent of the total fuel requirements for the device (hazardous waste plus other fuel) on a total heat input or mass input basis, whichever results in the lower mass feed rate of hazardous waste.

(3) The hazardous waste has a minimum heating value of 5,000 Btu/lb, as generated; and

(4) The hazardous waste fuel does not contain (and is not derived from) EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027.

(b) Mixing with nonhazardous fuels. If hazardous waste fuel is mixed with a nonhazardous fuel, the quantity of hazardous waste before such mixing is used to comply with paragraph (a).

(c) Multiple stacks. If an owner or operator burns hazardous waste in more than one onsite boiler or industrial furnace exempt under this section, the quantity limits provided by paragraph (a)(1) of this section are implemented according to the following equation:

$$\sum_{i=1}^n \frac{\text{Actual Quantity Burned}_{(i)}}{\text{Allowable Quantity Burned}_{(i)}} \leq 1.0$$

where:

n means the number of stacks;

Actual Quantity Burned means the waste quantity burned per month in device “i”;

Allowable Quantity Burned, means the maximum allowable exempt quantity for stack “i” from the table in (a)(1) above.

Note: Hazardous wastes that are subject to the special requirements for small quantity generators under section 262.16 may be burned in an offsite device under the exemption provided by 266.108, but must be included in the quantity determination for the exemption.

(d) Notification requirements. The owner or operator of facilities qualifying for the small quantity burner exemption under this section must provide a one-time signed, written notice to the Department indicating the following:

- (1) The combustion unit is operating as a small quantity burner of hazardous waste;
- (2) The owner and operator are in compliance with the requirements of this section; and
- (3) The maximum quantity of hazardous waste that the facility may burn per month as provided by 266.108(a)(1).

(e) Recordkeeping requirements. The owner or operator must maintain at the facility for at least three years sufficient records documenting compliance with the hazardous waste quantity, firing rate, and heating value limits of this section. At a minimum, these records must indicate the quantity of hazardous waste and other fuel burned in each unit per calendar month, and the heating value of the hazardous waste.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; SCSR 44–6 Doc. No. 4883, eff June 26, 2020.

Editor’s Note

Republished in 2016 to fix a typographical error.

266.109. Low risk waste exemption.

(a) Waiver of DRE standard. The DRE standard of 266.104(a) does not apply if the boiler or industrial furnace is operated in conformance with (a)(1) of this section and the owner or operator demonstrates by procedures prescribed in (a)(2) of this section that the burning will not result in unacceptable adverse health effects.

(1) The device shall be operated as follows:

(i) A minimum of 50 percent of fuel fired to the device shall be fossil fuel, fuels derived from fossil fuel, tall oil, or, if approved by the Department on a case-by-case basis, other nonhazardous fuel with combustion characteristics comparable to fossil fuel. Such fuels are termed “primary fuel” for purposes of this section. (Tall oil is a fuel derived from vegetable and rosin fatty acids.) The 50 percent primary fuel firing rate shall be determined on a total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired;

(ii) Primary fuels and hazardous waste fuels shall have a minimum as-fired heating value of 8,000 Btu/lb;

(iii) The hazardous waste is fired directly into the primary fuel flame zone of the combustion chamber; and

(iv) The device operates in conformance with the carbon monoxide controls provided by 266.104(b)(1). Devices subject to the exemption provided by this section are not eligible for the alternative carbon monoxide controls provided by 266.104(c).

(2) Procedures to demonstrate that the hazardous waste burning will not pose unacceptable adverse public health effects are as follows:

(i) Identify and quantify those nonmetal compounds listed in appendix VIII, part 261 of this chapter that could reasonably be expected to be present in the hazardous waste. The constituents excluded from analysis must be identified and the basis for their exclusion explained;

(ii) Calculate reasonable, worst case emission rates for each constituent identified in paragraph (a)(2)(i) of this section by assuming the device achieves 99.9 percent destruction and removal efficiency. That is, assume that 0.1 percent of the mass weight of each constituent fed to the device is emitted.

(iii) For each constituent identified in paragraph (a)(2)(i) of this section, use emissions dispersion modeling to predict the maximum annual average ground level concentration of the constituent.

(A) Dispersion modeling shall be conducted using methods specified in 266.106(h).

(B) Owners and operators of facilities with more than one onsite stack from a boiler or industrial furnace that is exempt under this section must conduct dispersion modeling of emissions from all stacks exempt under this section to predict ambient levels prescribed by this paragraph.

(iv) Ground level concentrations of constituents predicted under paragraph (a)(2)(iii) of this section must not exceed the following levels:

(A) For the noncarcinogenic compounds listed in appendix IV of this part, the levels established in appendix IV;

(B) For the carcinogenic compounds listed in appendix V of this part, the sum for all constituents of the ratios of the actual ground level concentration to the level established in appendix V cannot exceed 1.0; and

(C) For constituents not listed in appendix IV or V, 0.1 micrograms per cubic meter.

(b) Waiver of particulate matter standard. The particulate matter standard of 266.105 does not apply if:

(1) The DRE standard is waived under paragraph (a) of this section; and

(2) The owner or operator complies with the Tier I or adjusted Tier I metals feed rate screening limits provided by 266.106 (b) or (e).

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

266.110. Waiver of DRE trial burn for boilers.

Boilers that operate under the special requirements of this section, and that do not burn hazardous waste containing (or derived from) EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027, are considered to be in conformance with the DRE standard of 266.104(a), and a trial burn to demonstrate DRE is waived. When burning hazardous waste:

(a) A minimum of 50 percent of fuel fired to the device shall be fossil fuel, fuels derived from fossil fuel, tall oil, or, if approved by the Department on a case-by-case basis, other nonhazardous fuel with combustion characteristics comparable to fossil fuel. Such fuels are termed "primary fuel" for purposes of this section. (Tall oil is a fuel derived from vegetable and rosin fatty acids.) The 50 percent primary fuel firing rate shall be determined on a total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired;

(b) Boiler load shall not be less than 40 percent. Boiler load is the ratio at any time of the total heat input to the maximum design heat input;

(c) Primary fuels and hazardous waste fuels shall have a minimum as-fired heating value of 8,000 Btu/lb, and each material fired in a burner where hazardous waste is fired must have a heating value of at least 8,000 Btu/lb, as-fired;

(d) The device shall operate in conformance with the carbon monoxide standard provided by 266.104(b)(1). Boilers subject to the waiver of the DRE trial burn provided by this section are not eligible for the alternative carbon monoxide standard provided by 266.104(c);

(e) The boiler must be a watertube type boiler that does not feed fuel using a stoker or stoker type mechanism; and

(f) The hazardous waste shall be fired directly into the primary fuel flame zone of the combustion chamber with an air or steam atomization firing system, mechanical atomization system, or a rotary cup atomization system under the following conditions:

- (1) Viscosity. The viscosity of the hazardous waste fuel as-fired shall not exceed 300 SSU;
- (2) Particle size. When a high pressure air or steam atomizer, low pressure atomizer, or mechanical atomizer is used, 70% of the hazardous waste fuel must pass through a 200 mesh (74 micron) screen, and when a rotary cup atomizer is used, 70% of the hazardous waste must pass through a 100 mesh (150 micron) screen;
- (3) Mechanical atomization systems. Fuel pressure within a mechanical atomization system and fuel flow rate shall be maintained within the design range taking into account the viscosity and volatility of the fuel;
- (4) Rotary cup atomization systems. Fuel flow rate through a rotary cup atomization system must be maintained within the design range taking into account the viscosity and volatility of the fuel.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

266.111. Standards for direct transfer.

(a) Applicability. The regulations in this section apply to owners and operators of boilers and industrial furnaces subject to 266.102 or 266.103 if hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit.

(b) Definitions.

(1) 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 a 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.

(2) 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 (b)(1) of this section.

(c) General operating requirements.

(1) No direct transfer of a pumpable hazardous waste shall be conducted from an open-top container to a boiler or industrial furnace.

(2) 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.

(3) The direct transfer of hazardous waste to a boiler or industrial furnace shall be conducted so that it does not:

- (i) Generate extreme heat or pressure, fire, explosion, or violent reaction;
- (ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;
- (iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
- (iv) Damage the structural integrity of the container or direct transfer equipment containing the waste;
- (v) Adversely affect the capability of the boiler or industrial furnace to meet the standards provided by 266.104 through 266.107; or
- (vi) Threaten human health or the environment.

(4) 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.

(5) 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:

(i) Spill prevention controls (e.g., check valves, dry discount couplings); and

(ii) Automatic waste feed cutoff to use if a leak or spill occurs from the direct transfer equipment.

(d) 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:

(1) The containment requirements of 264.175 of this chapter;

(2) The use and management requirements of subpart I, part 265 of this chapter, 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

(3) The closure requirements of 264.178 of this chapter.

(e) Direct transfer equipment. Direct transfer equipment must meet the following requirements:

(1) Secondary containment. Owners and operators shall comply with the secondary containment requirements of 265.193 of this chapter, except for paragraphs 265.193 (a), (d), (e), and (i) as follows:

(i) For all new direct transfer equipment, prior to their being put into service; and

(ii) For existing direct transfer equipment within 2 years after August 21, 1991.

(2) Requirements prior to meeting secondary containment requirements.

(i) 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 270.11(d) of this chapter that attests to the equipment's integrity by August 21, 1992.

(ii) 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:

(A) Design standard(s), if available, according to which the direct transfer equipment was constructed;

(B) Hazardous characteristics of the waste(s) that have been or will be handled;

(C) Existing corrosion protection measures;

(D) Documented age of the equipment, if available, (otherwise, an estimate of the age); and

(E) 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.

(iii) 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 this chapter.

(3) Inspections and recordkeeping.

(i) 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 boiler or industrial furnace:

(A) Overflow/spill control equipment (e.g., waste-feed cutoff systems, bypass systems, and drainage systems) to ensure that it is in good working order;

(B) The aboveground portions of the direct transfer equipment to detect corrosion, erosion, or releases of waste (e.g., wet spots, dead vegetation); and

(C) 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.

(ii) 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 this chapter:

(iii) 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.

(4) Design and installation of new ancillary equipment. Owners and operators must comply with the requirements of 265.192 of this chapter.

(5) Response to leaks or spills. Owners and operators must comply with the requirements of 265.196 of this chapter.

(6) Closure. Owners and operators must comply with the requirements of 265.197 of this chapter, except for 265.197 (c)(2) through (c)(4).

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993.

266.112. Regulation of residues.

A residue derived from the burning or processing of hazardous waste in a 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 that may be generated as products of incomplete combustion. Sampling and analyses shall be in conformance with procedures prescribed in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, incorporated by reference in 260.11(a) of this chapter. 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.

(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 Beville Residue Determinations" in appendix IX of this part.

(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 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, or the level of detection (using analytical procedures prescribed in SW-846), whichever is higher. If a health-based limit for a constituent of concern is not listed in Appendix VII, then a limit of 0.002 micrograms per kilogram or the level of detection (using analytical procedures contained in SW-846, or other appropriate methods), whichever is higher, must be used. The levels specified in Appendix VII (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) 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 268.43 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 268.43 for F039 nonwastewaters. In complying with the 268.43 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 268.43 for F039 nonwastewaters, remains in effect until further administrative action is taken and notice is published in the Federal Register. (12/93; 12/94, 8/00)

(ii) Metal constituents. The concentration of metals in an extract obtained using the Toxicity Characteristic Leaching Procedure of 261.24 of this chapter must not exceed the levels specified in appendix VII of this part; 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 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.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1995; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003.

SUBPART M ***Military Munitions***

266.200. Applicability.

(a) The regulations in this subpart identify when military munitions become a solid waste, and, if these wastes are also hazardous under this subpart or 261, the management standards that apply to these wastes.

(b) Unless otherwise specified in this subpart, all applicable requirements in 260 through 270 apply to waste military munitions.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.201. Definitions.

In addition to the definitions in R.61-79.260.10, the following definitions apply to this subpart:

Active range means a military range that is currently in service and is being regularly used for range activities.

Chemical agents and munitions are defined as in 50 U.S.C. section 1521(j)(1).

Explosives or munitions emergency response specialist is as defined in 260.10.

Explosives or munitions emergency is as defined in 260.10.

Explosives or munitions emergency response is as defined in 260.10.

Inactive range means a military range that is not currently being used, but that is still under military control and considered by the military to be a potential range area, and that has not been put to a new use that is incompatible with range activities.

Military means the Department of Defense (DOD), the Armed Services, Coast Guard, National Guard, Department of Energy (DOE), or other parties under contract or acting as an agent for the foregoing, who handle military munitions.

Military munitions is as defined in 260.10.

Military range means designated land and water areas set aside, managed, and used to conduct research on, develop, test, and evaluate military munitions and explosives, other ordnance, or weapon systems, or to train military personnel in their use and handling. Ranges include firing lines and positions, maneuver areas, firing lanes, test pads, detonation pads, impact areas, and buffer zones with restricted access and exclusionary areas.

Unexploded ordnance (UXO) means military munitions that have been primed, fused, armed, or otherwise prepared for action, and have been fired, dropped, launched, projected, or placed in such a

manner as to constitute a hazard to operations, installation, personnel, or material and remain unexploded either by malfunction, design, or any other cause.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.202. Definition of solid waste.

(a) A military munition is not a solid waste when:

(1) Used for its intended purpose, including:

(i) Use in training military personnel or explosives and munitions emergency response specialists (including training in proper destruction of unused propellant or other munitions); or

(ii) Use in research, development, testing, and evaluation of military munitions, weapons, or weapon systems; or

(iii) Recovery, collection, and on-range destruction of unexploded ordnance and munitions fragments during range clearance activities at active or inactive ranges. However, "use for intended purpose" does not include the on-range disposal or burial of unexploded ordnance and contaminants when the burial is not a result of product use.

(2) An unused munition, or component thereof, is being repaired, reused, recycled, reclaimed, disassembled, reconfigured, or otherwise subjected to materials recovery activities, unless such activities involve use constituting disposal as defined in 261.2(c)(1), or burning for energy recovery as defined in 261.2(c)(2).

(b) An unused military munition is a solid waste when any of the following occurs:

(1) The munition is abandoned by being disposed of, burned, detonated (except during intended use as specified in paragraph (a) of this section), incinerated, or treated prior to disposal; or

(2) The munition is removed from storage in a military magazine or other storage area for the purpose of being disposed of, burned, or incinerated, or treated prior to disposal, or

(3) The munition is deteriorated or damaged (e.g., the integrity of the munition is compromised by cracks, leaks, or other damage) to the point that it cannot be put into serviceable condition, and cannot reasonably be recycled or used for other purposes; or

(4) The munition has been declared a solid waste by an authorized military official.

(c) A used or fired military munition is a solid waste:

(1) When transported off range or from the site of use, where the site of use is not a range, for the purposes of storage, reclamation, treatment, disposal, or treatment prior to disposal; or

(2) If recovered, collected, and then disposed of by burial, or landfilling either on or off a range.

(d) For purposes of RCRA section 1004(27), a used or fired military munition is a solid waste, and, therefore, is potentially subject to RCRA corrective action authorities under sections 3004(u) and (v), and 3008(h), or imminent and substantial endangerment authorities under section 7003, if the munition lands off-range and is not promptly rendered safe and/or retrieved. Any imminent and substantial threats associated with any remaining material must be addressed. If remedial action is infeasible, the operator of the range must maintain a record of the event for as long as any threat remains. The record must include the type of munition and its location (to the extent the location is known).

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.203. Standards applicable to the transportation of solid waste military munitions.

(a) Criteria for hazardous waste regulation of waste non-chemical military munitions in transportation.

(1) Waste military munitions that are being transported and that exhibit a hazardous waste characteristic or are listed as hazardous waste under 261, are listed or identified as a hazardous waste (and thus are subject to regulation under 260 through 270), unless all the following conditions are met:

(i) The waste military munitions are not chemical agents or chemical munitions;

(ii) The waste military munitions must be transported in accordance with the Department of Defense shipping controls applicable to the transport of military munitions;

(iii) The waste military munitions must be transported from a military owned or operated installation to a military owned or operated treatment, storage, or disposal facility; and

(iv) The transporter of the waste must provide oral notice to the Director within 24 hours from the time the transporter becomes aware of any loss or theft of the waste military munitions, or any failure to meet a condition of paragraph (a)(1) of this section that may endanger health or the environment. In addition, a written submission describing the circumstances shall be provided within 5 days from the time the transporter becomes aware of any loss or theft of the waste military munitions or any failure to meet a condition of paragraph (a)(1) of this section.

(2) If any waste military munitions shipped under paragraph (a)(1) of this section are not received by the receiving facility within 45 days of the day the waste was shipped, the owner or operator of the receiving facility must report this non-receipt to the Director within 5 days.

(3) The exemption in paragraph (a)(1) of this section from regulation as hazardous waste shall apply only to the transportation of non-chemical waste military munitions. It does not affect the regulatory status of waste military munitions as hazardous wastes with regard to storage, treatment or disposal.

(4) The conditional exemption in paragraph (a)(1) of this section applies only so long as all of the conditions in paragraph (a)(1) of this section are met.

(b) Reinstatement of exemption. If any waste military munition loses its exemption under paragraph (a)(1) of this section, an application may be filed with the Director for reinstatement of the exemption from hazardous waste transportation regulation with respect to such munition as soon as the munition is returned to compliance with the conditions of paragraph (a)(1) of this section. If the Director finds that reinstatement of the exemption is appropriate based on factors such as the transporter's provision of a satisfactory explanation of the circumstances of the violation, or a demonstration that the violations are not likely to recur, the Director may reinstate the exemption under paragraph (a)(1) of this section. If the Director does not take action on the reinstatement application within 60 days after receipt of the application, then reinstatement shall be deemed granted, retroactive to the date of the application. However, the Director may terminate a conditional exemption reinstated by default in the preceding sentence if the Director finds that reinstatement is inappropriate based on factors such as the transporter's failure to provide a satisfactory explanation of the circumstances of the violation, or failure to demonstrate that the violations are not likely to recur. In reinstating the exemption under paragraph (a)(1) of this section, the Director may specify additional conditions as are necessary to ensure and document proper transportation to protect human health and the environment.

(c) Amendments to DOD shipping controls. The Department of Defense shipping controls applicable to the transport of military munitions referenced in paragraph (a)(1)(ii) of this section are Government Bill of Lading (GBL) (GSA Standard Form 1109), requisition tracking form DD Form 1348, the Signature and Talley Record (DD Form 1907), Special Instructions for Motor Vehicle Drivers (DD Form 836), and the Motor Vehicle Inspection Report (DD Form 626) in effect on November 8, 1995, except as provided in the following sentence. Any amendments to the Department of Defense shipping controls shall become effective for purposes of paragraph (a)(1) of this section on the date the Department of Defense publishes notice in the Federal Register that the shipping controls referenced in paragraph (a)(1)(ii) of this section have been amended.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.204. Standards applicable to emergency responses.

Explosives and munitions emergencies involving military munitions or explosives are subject to 262.10(i), 263.10(e), 264.1(g)(8), 265.1(c)(11), and 270.1(c)(3), or alternatively to 270.61.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.205. Standards applicable to the storage of solid waste military munitions.

(a) Criteria for hazardous waste regulation of waste non-chemical military munitions in storage.

(1) Waste military munitions in storage that exhibit a hazardous waste characteristic or are listed as hazardous waste under 261, are listed or identified as a hazardous waste (and thus are subject to regulation under 260 through 279), unless all the following conditions are met:

(i) The waste military munitions are not chemical agents or chemical munitions.

(ii) The waste military munitions must be subject to the jurisdiction of the Department of Defense Explosives Safety Board (DDESB).

(iii) The waste military munitions must be stored in accordance with the DDESB storage standards applicable to waste military munitions.

(iv) Within 90 days of August 12, 1997 or within 90 days of when a storage unit is first used to store waste military munitions, whichever is later, the owner or operator must notify the Director of the location of any waste storage unit used to store waste military munitions for which the conditional exemption in paragraph (a)(1) is claimed.

(v) The owner or operator must provide oral notice to the Director within 24 hours from the time the owner or operator becomes aware of any loss or theft of the waste military munitions, or any failure to meet a condition of paragraph (a)(1) that may endanger health or the environment. In addition, a written submission describing the circumstances shall be provided within 5 days from the time the owner or operator becomes aware of any loss or theft of the waste military munitions or any failure to meet a condition of paragraph (a)(1) of this section.

(vi) The owner or operator must inventory the waste military munitions at least annually, must inspect the waste military munitions at least quarterly for compliance with the conditions of paragraph (a)(1) of this section, and must maintain records of the findings of these inventories and inspections for at least three years.

(vii) Access to the stored waste military munitions must be limited to appropriately trained and authorized personnel.

(2) The conditional exemption in paragraph (a)(1) of this section from regulation as hazardous waste shall apply only to the storage of non-chemical waste military munitions. It does not affect the regulatory status of waste military munitions as hazardous wastes with regard to transportation, treatment or disposal.

(3) The conditional exemption in paragraph (a)(1) of this section applies only so long as all of the conditions in paragraph (a)(1) of this section are met.

(b) Notice of termination of waste storage. The owner or operator must notify the Director when a storage unit identified in paragraph (a)(1)(iv) of this section will no longer be used to store waste military munitions.

(c) Reinstatement of conditional exemption. If any waste military munition loses its conditional exemption under paragraph (a)(1) of this section, an application may be filed with the Director for reinstatement of the conditional exemption from hazardous waste storage regulation with respect to such munition as soon as the munition is returned to compliance with the conditions of paragraph (a)(1) of this section. If the Director finds that reinstatement of the conditional exemption is appropriate based on factors such as the owner's or operator's provision of a satisfactory explanation of the circumstances of the violation, or a demonstration that the violations are not likely to recur, the Director may reinstate the conditional exemption under paragraph (a)(1) of this section. If the Director does not take action on the reinstatement application within 60 days after receipt of the application, then reinstatement shall be deemed granted, retroactive to the date of the application. However, the Director may terminate a conditional exemption reinstated by default in the preceding sentence if he/she finds that reinstatement is inappropriate based on factors such as the owner's or operator's failure to provide a satisfactory explanation of the circumstances of the violation, or failure to demonstrate that the violations are not likely to recur. In reinstating the conditional exemption under paragraph (a)(1) of this section, the Director may specify additional conditions as are necessary to ensure and document proper storage to protect human health and the environment.

(d) Waste chemical munitions.

(1) Waste military munitions that are chemical agents or chemical munitions and that exhibit a hazardous waste characteristic or are listed as hazardous waste under 261, are listed or identified as a hazardous waste and shall be subject to the applicable regulatory requirements of RCRA subtitle C.

(2) Waste military munitions that are chemical agents or chemical munitions and that exhibit a hazardous waste characteristic or are listed as hazardous waste under 261, are not subject to the storage prohibition in RCRA section 3004(j), codified at 268.50.

(e) Amendments to DDESB storage standards. The DDESB storage standards applicable to waste military munitions, referenced in paragraph (a)(1)(iii) of this section, are DOD 6055.9-STD (“DOD Ammunition and Explosive Safety Standards”), in effect on November 8, 1995, except as provided in the following sentence. Any amendments to the DDESB storage standards shall become effective for purposes of paragraph (a)(1) of this section on the date the Department of Defense publishes notice in the Federal Register that the DDESB standards referenced in paragraph (a)(1) of this section have been amended.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

266.206. Standards applicable to the treatment and disposal of waste military munitions.

The treatment and disposal of hazardous waste military munitions are subject to the applicable permitting, procedural, and technical standards in 260 through 270.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

SUBPART N

Conditional Exemption for Low-Level Mixed Waste Storage, Treatment, Transportation and Disposal Terms

266.210. What definitions apply to this subpart?

This subpart uses the following special definitions:

Agreement State means a state that has entered into an agreement with the NRC under subsection 274b of the Atomic Energy Act of 1954, as amended (68 Stat. 919), to assume responsibility for regulating within its borders byproduct, source, or special nuclear material in quantities not sufficient to form a critical mass.

Certified delivery means certified mail with return receipt requested, or equivalent courier service, or other means, that provides the sender with a receipt confirming delivery.

Exempted waste means a waste that meets the eligibility criteria in 266.225 and meets all of the conditions in 266.230, or meets the eligibility criteria in 266.310. Such waste is conditionally exempted from the regulatory definition of hazardous waste described in 261.3.

License means a license issued by the Nuclear Regulatory Commission, or NRC Agreement State, to users that manage radionuclides regulated by NRC, or NRC Agreement States, under authority of the Atomic Energy Act of 1954, as amended.

Low-Level Mixed Waste (LLMW) is a waste that contains both low-level radioactive waste and RCRA hazardous waste.

Low-Level Radioactive Waste (LLW) is a radioactive waste which contains source, special nuclear, or byproduct material, and which is not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or byproduct material as defined in section 11e.(2) of the Atomic Energy Act. (See also NRC definition of “waste” at 10 CFR 61.2)

Mixed Waste means a waste that contains both RCRA hazardous waste and source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954, as amended.

Naturally Occurring and/or Accelerator-produced Radioactive Material (NARM) means radioactive materials that: (1) Are naturally occurring and are not source, special nuclear, or byproduct materials (as defined by the AEA) or (2) Are produced by an accelerator. NARM is regulated by the States under State law, or by DOE (as authorized by the AEA) under DOE orders.

NRC means the U. S. Nuclear Regulatory Commission.

We or us within this subpart, means the Director of the Division of Waste Management

You means a generator of low-level mixed waste or eligible NARM.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

Storage and Treatment Conditional Exemption and Eligibility

266.220. What does a storage and treatment conditional exemption do?

The storage and treatment conditional exemption exempts your low-level mixed waste from the regulatory definition of hazardous waste in 261.3 if your waste meets the eligibility criteria in 266.225 and you meet the conditions in 266.230.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

266.225 What wastes are eligible for the storage and treatment conditional exemption?

Low-level mixed waste (LLMW), defined in 266.210, is eligible for this conditional exemption if it is generated and managed by you under a single NRC or NRC Agreement State license. (Mixed waste generated at a facility with a different license number and shipped to your facility for storage and treatment requires a permit and is ineligible for this exemption. In addition, NARM waste is ineligible for this exemption.)

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

266.230. What conditions must you meet for your LLMW to qualify for and maintain a storage and treatment exemption?

(a) For your LLMW to qualify for the exemption you must notify the Director of the Division of Waste Management in writing by certified delivery that you are claiming a conditional exemption for the LLMW stored on your facility. The dated notification must include your name, address, RCRA identification number, NRC or NRC Agreement State license number, the waste code(s) and storage unit(s) for which you are seeking an exemption, and a statement that you meet the conditions of this subpart. Your notification must be signed by your authorized representative who certifies that the information in the notification is true, accurate, and complete. You must notify the Director of your claim either within 90 days of the effective date of this rule in your State, or within 90 days of when a storage unit is first used to store conditionally exempt LLMW.

(b) To qualify for and maintain an exemption for your LLMW you must:

(1) Store your LLMW waste in tanks or containers in compliance with the requirements of your license that apply to the proper storage of low-level radioactive waste (not including those license requirements that relate solely to recordkeeping);

(2) Store your LLMW in tanks or containers in compliance with chemical compatibility requirements of a tank or container in 264.177 or 264.199 or 265.177 or 265.199;

(3) Certify that facility personnel who manage stored conditionally exempt LLMW are trained in a manner that ensures that the conditionally exempt waste is safely managed and includes training in chemical waste management and hazardous materials incidents response that meets the personnel training standards found in 265.16(a)(3);

(4) Conduct an inventory of your stored conditionally exempt LLMW at least annually and inspect it at least quarterly for compliance with subpart N of this part; and

(5) Maintain an accurate emergency plan and provide it to all local authorities who may have to respond to a fire, explosion, or release of hazardous waste or hazardous constituents. Your plan must describe emergency response arrangements with local authorities; describe evacuation plans; list the names, addresses, and telephone numbers of all facility personnel qualified to work with local authorities as emergency coordinators; and list emergency equipment.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

266.235. What waste treatment does the storage and treatment conditional exemption allow?

You may treat your low-level mixed waste at your facility within a tank or container in accordance with the terms of your NRC or NRC Agreement State license. Treatment that cannot be done in a tank or container without a RCRA permit (such as incineration) is not allowed under this exemption.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

Loss of Conditional Exemption

266.240. How could you lose the conditional exemption for your LLMW and what action must you take?

(a) Your LLMW will automatically lose the storage and treatment conditional exemption if you fail to meet any of the conditions specified in 266.230. When your LLMW loses the exemption, you must immediately manage that waste which failed the condition as RCRA hazardous waste, and the storage unit storing the LLMW immediately becomes subject to RCRA hazardous waste container and/or tank storage requirements.

(1) If you fail to meet any of the conditions specified in 266.230 you must report to the Director of the Division of Waste Management and the oversight agency in the NRC Agreement State, in writing by certified delivery within 30 days of learning of the failure. Your report must be signed by your authorized representative certifying that the information provided is true, accurate, and complete. This report must include:

- (i) The specific condition(s) you failed to meet;
- (ii) A description of the LLMW (including the waste name, hazardous waste codes and quantity) and storage location at the facility; and
- (iii) The date(s) on which you failed to meet the condition(s).

(2) If the failure to meet any of the conditions may endanger human health or the environment, you must also immediately notify the Director of the Division of Waste Management orally within 24 hours and follow up with a written notification within five days. Failures that may endanger human health or the environment include, but are not limited to, discharge of a CERCLA reportable quantity or other leaking, burning or exploding tanks or containers, or detection of radionuclides above background or hazardous constituents in the leachate collection system of a storage area. If the failure may endanger human health or the environment, you must follow the provisions of your emergency plan.

(b) We may terminate your conditional exemption for your LLMW, or require you to meet additional conditions to claim a conditional exemption, for serious or repeated noncompliance with any requirement(s) of subpart N of this part.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

266.245. If you lose the storage and treatment conditional exemption for your LLMW, can the exemption be reclaimed?

(a) You may reclaim the storage exemption for your LLMW if:

- (1) You again meet the conditions specified in 266.230; and
- (2) You send the Director of the Division of Waste Management a notice by certified delivery that you are reclaiming the exemption for your LLMW. Your notice must be signed by your authorized representative certifying that the information contained in your notice is true, complete, and accurate. In your notice you must do the following:
 - (i) Explain the circumstances of each failure.
 - (ii) Certify that you have corrected each failure that caused you to lose the exemption for your LLMW and that you again meet all the conditions as of the date you specify.
 - (iii) Describe plans that you have implemented, listing specific steps you have taken, to ensure the conditions will be met in the future.
 - (iv) Include any other information you want us to consider when we review your notice reclaiming the exemption.

(b) We may terminate a reclaimed conditional exemption if we find that your claim is inappropriate based on factors including, but not limited to, the following: you have failed to correct the problem; you explained the circumstances of the failure unsatisfactorily; or you failed to implement a plan with steps to prevent another failure to meet the conditions of 266.230. In reviewing a reclaimed conditional exemption under this section, we may add conditions to the exemption to

ensure that waste management during storage and treatment of the LLMW will protect human health and the environment.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

Recordkeeping

266.250. What records must you keep at your facility and for how long?

(a) In addition to those records required by your NRC or NRC Agreement State license, you must keep records as follows:

- (1) Your initial notification records, return receipts, reports to us of failure(s) to meet the exemption conditions, and all records supporting any reclaim of an exemption;
- (2) Records of your LLMW annual inventories, and quarterly inspections;
- (3) Your certification that facility personnel who manage stored mixed waste are trained in safe management of LLMW including training in chemical waste management and hazardous materials incidents response; and
- (4) Your emergency plan as specified in 266.230(b).

(b) You must maintain records concerning notification, personnel trained, and your emergency plan for as long as you claim this exemption and for three years thereafter, or in accordance with NRC regulations under 10 CFR part 20 (or equivalent NRC Agreement State regulations), whichever is longer. You must maintain records concerning your annual inventory and quarterly inspections for three years after the waste is sent for disposal, or in accordance with NRC regulations under 10 CFR part 20 (or equivalent NRC Agreement State regulations), whichever is longer.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

Reentry Into RCRA

266.255. When is your LLMW no longer eligible for the storage and treatment conditional exemption?

(a) When your LLMW has met the requirements of your NRC or NRC Agreement State license for decay-in-storage and can be disposed of as non-radioactive waste, then the conditional exemption for storage no longer applies. On that date your waste is subject to hazardous waste regulation under the relevant sections of parts 260 through 271, and the time period for accumulation of a hazardous waste as specified in R.61-79.262.16 or 262.17 begins.

(b) When your conditionally exempt LLMW, which has been generated and stored under a single NRC or NRC Agreement State license number, is removed from storage, it is no longer eligible for the storage and treatment exemption.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002. Amended by SCSR 43-5 Doc. No. 4841, eff May 24, 2019.

Storage Unit Closure

266.260. Do closure requirements apply to units that stored LLMW prior to the effective date of Subpart N?

Interim status and permitted storage units that have been used to store only LLMW prior to the effective date of Subpart N and, after that date, store only LLMW which becomes exempt under this Subpart N, are not subject to the closure requirements of parts 264 and 265. Storage units (or portions of units) that have been used to store both LLMW and non-mixed hazardous waste prior to the effective date of Subpart N or are used to store both after that date remain subject to closure requirements with respect to the non-mixed hazardous waste.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

APPENDIX I. Tier I and Tier II Feed Rate and Emissions Screening Limits For Metals

Table 1-A.— Tier I and Tier II Feed Rate and Emissions Screening Limits for Noncarcinogenic Metals for Facilities in Noncomplex Terrain

(Values for urban areas)

Terrain adjusted eff. stack ht. (m)	Antimony (g/hr)	Barium (g/hr)	Lead (g/hr)	Mercury (g/hr)	Silver (g/hr)	Thellium (g/hr)
4	6.0E+01	1.0E+04	1.8E+01	6.0E+01	6.0E+02	6.0E+01
6	6.8E+01	1.1E+04	2.0E+01	6.8E+01	6.8E+02	6.8E+01
8	7.6E+01	1.3E+04	2.3E+01	7.6E+01	7.6E+02	7.6E+01
10	8.6E+01	1.4E+04	2.6E+01	8.6E+01	8.6E+02	8.6E+01
12	9.6E+01	1.7E+04	3.0E+01	9.6E+01	9.6E+02	9.6E+01
14	1.1E+02	1.8E+04	3.4E+01	1.1E+02	1.1E+03	1.1E+02
16	1.3E+02	2.1E+04	3.6E+01	1.3E+02	1.3E+03	1.3E+02
18	1.4E+02	2.4E+04	4.3E+01	1.4E+02	1.4E+03	1.4E+02
20	1.6E+02	2.7E+04	4.6E+01	1.6E+02	1.6E+03	1.6E+02
22	1.8E+02	3.0E+04	5.4E+01	1.8E+02	1.8E+03	1.8E+02
24	2.0E+02	3.4E+04	6.0E+01	2.0E+02	2.0E+03	2.0E+02
26	2.3E+02	3.9E+04	6.8E+01	2.3E+02	2.3E+03	2.3E+02
28	2.6E+02	4.3E+04	7.8E+01	2.6E+02	2.6E+03	2.6E+02
30	3.0E+02	5.0E+04	9.0E+01	3.0E+02	3.0E+03	3.0E+02
35	4.0E+02	6.6E+04	1.1E+02	4.0E+02	4.0E+03	4.0E+02
40	4.6E+02	7.8E+04	1.4E+02	4.6E+02	4.6E+03	4.6E+02
45	6.0E+02	1.0E+05	1.8E+02	6.0E+02	6.0E+03	6.0E+02
50	7.8E+02	1.3E+05	2.3E+02	7.8E+02	7.8E+03	7.8E+02
55	9.6E+02	1.7E+05	3.0E+02	9.6E+02	9.6E+03	9.6E+02
60	1.2E+03	2.0E+05	3.6E+02	1.2E+03	1.2E+04	1.2E+03
65	1.5E+03	2.5E+05	4.3E+02	1.5E+03	1.5E+04	1.5E+03
70	1.7E+03	2.8E+05	5.0E+02	1.7E+03	1.7E+04	1.7E+03
75	1.9E+03	3.2E+05	5.8E+02	1.9E+03	1.9E+04	1.9E+03
80	2.2E+03	3.6E+05	6.4E+02	2.2E+03	2.2E+04	2.2E+03
85	2.5E+03	4.0E+05	7.6E+02	2.5E+03	2.5E+04	2.5E+03
90	2.8E+03	4.6E+05	8.2E+02	2.8E+03	2.8E+04	2.8E+03
95	3.2E+03	5.4E+05	9.6E+02	3.2E+03	3.2E+04	3.2E+03
100	3.6E+03	6.0E+05	1.1E+03	3.6E+03	3.6E+04	3.6E+03
105	4.0E+03	6.8E+05	1.2E+03	4.0E+03	4.0E+04	4.0E+03
110	4.6E+03	7.8E+05	1.4E+03	4.6E+03	4.6E+04	4.6E+03
115	5.4E+03	8.6E+05	1.6E+03	5.4E+03	5.4E+04	5.4E+03
120	6.0E+03	1.0E+06	1.8E+03	6.0E+03	6.0E+04	6.0E+03

Table 1-B.— Tier I and Tier II Feed Rate and Emissions Screening Limits for Noncarcinogenic Metals for Facilities in Noncomplex Terrain

(Values for rural areas)

Terrain adjusted eff. stack ht. (m)	Antimony (g/hr)	Barium (g/hr)	Lead (g/hr)	Mercury (g/hr)	Silver (g/hr)	Thallium (g/hr)
4	3.1E+01	5.2E+03	9.4E+00	3.1E+01	3.1E+02	3.1E+01
6	3.6E+01	6.0E+03	1.1E+01	3.6E+01	3.6E+02	3.6E+01
8	4.0E+01	6.8E+03	1.2E+01	4.0E+01	4.0E+02	4.0E+01
10	4.6E+01	7.8E+03	1.4E+01	4.6E+01	4.6E+02	4.6E+01
12	5.8E+01	9.6E+03	1.7E+01	5.8E+01	5.8E+02	5.8E+01
14	6.8E+01	1.1E+04	2.1E+01	6.8E+01	6.8E+02	6.8E+01
16	8.6E+01	1.4E+04	2.6E+01	8.6E+01	8.6E+02	8.6E+01
18	1.1E+02	1.8E+04	3.2E+01	1.1E+02	1.1E+03	1.1E+02
20	1.3E+02	2.2E+04	4.0E+01	1.3E+02	1.3E+03	1.3E+02

Terrain adjusted eff. stack ht. (m)	Antimony (g/hr)	Barium (g/hr)	Lead (g/hr)	Mercury (g/hr)	Silver (g/hr)	Thallium (g/hr)
22	1.7E+02	2.8E+04	5.0E+01	1.7E+02	1.7E+03	1.7E+02
24	2.2E+02	3.6E+04	6.4E+01	2.2E+02	2.2E+03	2.2E+02
26	2.8E+02	4.6E+04	8.2E+01	2.8E+02	2.8E+03	2.8E+02
28	3.5E+02	5.8E+04	1.0E+02	3.5E+02	3.5E+03	3.5E+02
30	4.3E+02	7.6E+04	1.3E+02	4.3E+02	4.3E+03	4.3E+02
35	7.2E+02	1.2E+05	2.1E+02	7.2E+02	7.2E+03	7.2E+02
40	1.1E+03	1.8E+05	3.2E+02	1.1E+03	1.1E+04	1.1E+03
45	1.5E+03	2.5E+05	4.8E+02	1.5E+03	1.5E+04	1.5E+03
50	2.0E+03	3.3E+05	6.0E+02	2.0E+03	2.0E+04	2.0E+03
55	2.6E+03	4.4E+05	7.8E+02	2.6E+03	2.6E+04	2.6E+03
60	3.4E+03	5.8E+05	1.0E+03	3.4E+03	3.4E+04	3.4E+03
65	4.6E+03	7.6E+05	1.4E+03	4.6E+03	4.6E+04	4.6E+03
70	5.4E+03	9.0E+05	1.6E+03	5.4E+03	5.4E+04	5.4E+03
75	6.4E+03	1.1E+06	1.9E+03	6.4E+03	6.4E+04	6.4E+03
80	7.6E+03	1.3E+06	2.3E+03	7.6E+03	7.6E+04	7.6E+03
85	9.4E+03	1.5E+06	2.8E+03	9.4E+03	9.4E+04	9.4E+03
90	1.1E+04	1.8E+06	3.3E+03	1.1E+04	1.1E+05	1.1E+04
95	1.3E+04	2.2E+06	3.9E+03	1.3E+04	1.3E+05	1.3E+04
100	1.5E+04	2.6E+06	4.6E+03	1.5E+04	1.5E+05	1.5E+04
105	1.8E+04	3.0E+06	5.4E+03	1.8E+04	1.8E+05	1.8E+04
110	2.2E+04	3.6E+06	6.6E+03	2.2E+04	2.2E+05	2.2E+04
115	2.6E+04	4.4E+06	7.8E+03	2.6E+04	2.6E+05	2.6E+04
120	3.1E+04	5.0E+06	9.2E+03	3.1E+04	3.1E+05	3.1E+04

Table I-C.— Tier I and Tier II Feed Rate and Emissions Screening Limits for Noncarcinogenic Metals for Facilities in Complex Terrain

Terrain adjusted eff. stack ht. (m)	Values for urban and rural areas					
	Antimony (g/hr)	Barium (g/hr)	Lead (g/hr)	Mercury (g/hr)	Silver (g/hr)	Thallium (g/hr)
4	1.4E+01	2.4E+03	4.3E+00	1.4E+01	1.4E+02	1.4E+01
6	2.1E+01	3.5E+03	6.2E+00	2.1E+01	2.1E+02	2.1E+01
8	3.0E+01	5.0E+03	9.2E+00	3.0E+01	3.0E+02	3.0E+01
10	4.3E+01	7.6E+03	1.3E+01	4.3E+01	4.3E+02	4.3E+01
12	5.4E+01	9.0E+03	1.7E+01	5.4E+01	5.4E+02	5.4E+01
14	6.8E+01	1.1E+04	2.0E+01	6.8E+01	6.8E+02	6.8E+01
16	7.8E+01	1.3E+04	2.4E+01	7.8E+01	7.8E+02	7.8E+01
18	8.6E+01	1.4E+04	2.6E+01	8.6E+01	8.6E+02	8.6E+01
20	9.6E+01	1.6E+04	2.9E+01	9.6E+01	9.6E+02	9.6E+01
22	1.0E+02	1.8E+04	3.2E+01	1.0E+02	1.0E+03	1.0E+02
24	1.2E+02	1.9E+04	3.5E+01	1.2E+02	1.2E+03	1.2E+02
26	1.3E+02	2.2E+04	3.6E+01	1.3E+02	1.3E+03	1.3E+02
28	1.4E+02	2.4E+04	4.3E+01	1.4E+02	1.4E+03	1.4E+02
30	1.6E+02	2.7E+04	4.6E+01	1.6E+02	1.6E+03	1.6E+02
35	2.0E+02	3.3E+04	5.8E+01	2.0E+02	2.0E+03	2.0E+02
40	2.4E+02	4.0E+04	7.2E+01	2.4E+02	2.4E+03	2.4E+02
45	3.0E+02	5.0E+04	9.0E+01	3.0E+02	3.0E+03	3.0E+02
50	3.6E+02	8.0E+04	1.1E+02	3.6E+02	3.6E+03	3.6E+02
55	4.6E+02	7.6E+04	1.4E+02	4.6E+02	4.6E+03	4.6E+02
60	5.8E+02	9.4E+04	1.7E+02	5.8E+02	5.8E+03	5.8E+02
65	6.8E+02	1.1E+05	2.1E+02	6.8E+02	6.8E+03	6.8E+02
70	7.8E+02	1.3E+05	2.4E+02	7.8E+02	7.8E+03	7.8E+02

Terrain adjusted eff. stack ht. (m)	Antimony (g/hr)	Barium (g/hr)	Lead (g/hr)	Mercury (g/hr)	Silver (g/hr)	Thallium (g/hr)
75	8.6E+02	1.4E+05	2.6E+02	8.6E+02	8.6E+03	8.6E+02
80	9.6E+02	1.6E+05	2.9E+02	9.6E+02	9.6E+03	9.6E+02
85	1.1E+03	1.8E+05	3.3E+02	1.1E+03	1.1E+04	1.1E+03
90	1.2E+03	2.0E+05	3.6E+02	1.2E+03	1.2E+04	1.2E+03
95	1.4E+03	2.3E+05	4.0E+02	1.4E+03	1.4E+04	1.4E+03
100	1.5E+03	2.6E+05	4.6E+02	1.5E+03	1.5E+04	1.5E+03
105	1.7E+03	2.8E+05	5.0E+02	1.7E+03	1.7E+04	1.7E+03
110	1.9E+03	3.2E+05	5.8E+02	1.9E+03	1.9E+04	1.9E+03
115	2.1E+03	3.6E+05	6.4E+02	2.1E+03	2.1E+04	2.1E+03
120	2.4E+03	4.0E+05	7.2E+02	2.4E+03	2.4E+04	2.4E+03

Table I-D.— Tier I and Tier II Feed Rate and Emissions Screening Limits for Carcinogenic Metals for Facilities in Noncomplex Terrain

Terrain adjusted eff. stack ht. (m)	Values for use in urban areas				Values for use in rural areas			
	Arsenic (g/hr)	Cadmium (g/hr)	Chromium (g/hr)	Beryllium (g/hr)	Arsenic (g/hr)	Cadmium (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	4.6E-01	1.1E+00	1.7E-01	8.2E-01	2.4E-01	5.8E-01	8.6E-02	4.3E-01
6	5.4E-01	1.3E+00	1.9E-01	9.4E-01	2.8E-01	6.6E-01	1.0E-01	5.0E-01
8	6.0E-01	1.4E+00	2.2E-01	1.1E+00	3.2E-01	7.6E-01	1.1E-01	5.6E-01
10	6.8E-01	1.6E+00	2.4E-01	1.2E+00	3.6E-01	8.6E-01	1.3E-01	6.4E-01
12	7.6E-01	1.8E+00	2.7E-01	1.4E+00	4.3E-01	1.1E+00	1.6E-01	7.8E-01
14	8.6E-01	2.1E+00	3.1E-01	1.5E+00	5.4E-01	1.3E+00	2.0E-01	9.6E-01
16	9.6E-01	2.3E+00	3.5E-01	1.7E+00	6.8E-01	1.6E+00	2.4E-01	1.2E+00
18	1.1E+00	2.6E+00	4.0E-01	2.0E+00	8.2E-01	2.0E+00	3.0E-01	1.5E+00
20	1.2E+00	3.0E+00	4.4E-01	2.2E+00	1.0E+00	2.5E+00	3.7E-01	1.9E+00
22	1.4E+00	3.4E+00	5.0E-01	2.5E+00	1.3E+00	3.2E+00	4.8E-01	2.4E+00
24	1.6E+00	3.9E+00	5.8E-01	2.8E+00	1.7E+00	4.0E+00	6.0E-01	3.0E+00
26	1.8E+00	4.3E+00	6.4E-01	3.2E+00	2.1E+00	5.0E+00	7.6E-01	3.9E+00
28	2.0E+00	4.8E+00	7.2E-01	3.6E+00	2.7E+00	6.4E+00	9.8E-01	5.0E+00
30	2.3E+00	5.4E+00	8.2E-01	4.0E+00	3.5E+00	8.2E+00	1.2E+00	6.2E+00
35	3.0E+00	6.8E+00	1.0E+00	5.4E+00	5.4E+00	1.3E+01	1.9E+00	9.6E+00
40	3.6E+00	9.0E+00	1.3E+00	6.8E+00	8.2E+00	2.0E+01	3.0E+00	1.5E+01
45	4.8E+00	1.1E+01	1.7E+00	8.6E+00	1.1E+01	2.8E+01	4.2E+00	2.1E+01
50	6.0E+00	1.4E+01	2.2E+00	1.1E+01	1.5E+01	3.7E+01	5.4E+00	2.8E+01
55	7.6E+00	1.8E+01	2.7E+00	1.4E+01	2.0E+01	5.0E+01	7.2E+00	3.6E+01
60	9.4E+00	2.2E+01	3.4E+00	1.7E+01	2.7E+01	6.4E+01	9.6E+00	4.8E+01
65	1.1E+01	2.8E+01	4.2E+00	2.1E+01	3.6E+01	8.6E+01	1.3E+01	6.4E+01
70	1.3E+01	3.1E+01	4.6E+00	2.4E+01	4.3E+01	1.0E+02	1.5E+01	7.6E+01
75	1.5E+01	3.6E+01	5.4E+00	2.7E+01	5.0E+01	1.2E+02	1.8E+01	9.0E+01
80	1.7E+01	4.0E+01	6.0E+00	3.0E+01	8.0E+01	1.4E+02	2.2E+01	1.1E+02
85	1.9E+01	4.8E+01	8.9E+00	3.4E+01	7.2E+01	1.7E+02	2.8E+01	1.3E+02
90	2.2E+01	5.0E+01	7.8E+00	3.9E+01	8.6E+01	2.0E+02	3.0E+01	1.5E+02
95	2.5E+01	5.8E+01	9.0E+00	4.4E+01	1.0E+02	2.4E+02	3.6E+01	1.8E+02
100	2.8E+01	6.8E+01	1.0E+01	5.0E+01	1.2E+02	2.9E+02	4.3E+01	2.2E+02
105	3.2E+01	7.6E+01	1.1E+01	5.6E+01	1.4E+02	3.4E+02	5.0E+01	2.6E+02
110	3.6E+01	8.6E+01	1.3E+01	6.4E+01	1.7E+02	4.0E+02	6.0E+01	3.0E+02
115	4.0E+01	9.6E+01	1.5E+01	7.2E+01	2.0E+02	4.8E+02	7.2E+01	3.6E+02
120	4.6E+01	1.1E+02	1.7E+01	8.2E+01	2.4E+02	5.8E+02	8.6E+01	4.3E+02

Table I-E.— Tier I and Tier II Feed Rate and Emissions Screening Limits for Carcinogenic Metals for Facilities in Complex Terrain

Terrain adjusted eff. stack ht. (m)	Values for use in urban and rural areas			
	Arsenic (g/hr)	Cadmium (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	1.1E-01	2.6E-01	4.0E-02	2.0E-01
6	1.6E-01	3.9E-01	5.8E-02	2.9E-01
8	2.4E-01	5.8E-01	8.8E-02	4.3E-01
10	3.5E-01	8.2E-01	1.3E-01	6.2E-01

Terrain adjusted eff. stack ht. (m)	Arsenic (g/hr)	Cadmium (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
12	4.3E-01	1.0E+00	1.5E-01	7.6E-01
14	5.0E-01	1.3E+00	1.9E-01	9.4E-01
16	6.0E-01	1.4E+00	2.2E-01	1.1E+00
18	6.8E-01	1.6E+00	2.4E-01	1.2E+00
20	7.6E-01	1.8E+00	2.7E-01	1.3E+00
22	8.2E-01	1.9E+00	3.0E-01	1.5E+00
24	9.0E-01	2.1E+00	3.3E-01	1.6E+00
26	1.0E+00	2.4E+00	3.6E-01	1.8E+00
28	1.1E+00	2.7E+00	4.0E-01	2.0E+00
30	1.2E+00	3.0E+00	4.4E-01	2.2E+00
35	1.5E+00	3.7E+00	5.4E-01	2.7E+00
40	1.9E+00	4.6E+00	6.8E-01	3.4E+00
45	2.4E+00	5.4E+00	8.4E-01	4.2E+00
50	2.9E+00	6.8E+00	1.0E+00	5.0E+00
55	3.5E+00	8.4E+00	1.3E+00	8.4E+00
60	4.3E+00	1.0E+01	1.5E+00	7.8E+00
65	5.4E+00	1.3E+01	1.9E+00	9.6E+00
70	6.0E+00	1.4E+01	2.2E+00	1.1E+01
75	6.8E+00	1.6E+01	2.4E+00	1.2E+01
80	7.6E+00	1.8E+01	2.7E+00	1.3E+01
85	8.2E+00	2.0E+01	3.0E+00	1.5E+01
90	9.4E+00	2.3E+01	3.4E+00	1.7E+01
95	1.0E+01	2.5E+01	4.0E+00	1.9E+01
100	1.2E+01	2.8E+01	4.3E+00	2.1E+01
105	1.3E+01	3.2E+01	4.8E+00	2.4E+01
110	1.5E+01	3.5E+01	5.4E+00	2.7E+01
115	1.7E+01	4.0E+01	6.0E+00	3.0E+01
120	1.9E+01	4.4E+01	6.4E+00	3.3E+01

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX II. Tier I Feed Rate Screening Limits For Total Chlorine

Terrain-adjusted effective stack height (m)	Noncomplex Terrain		Complex Terrain
	Urban (g/hr)	Rural (g/hr)	(g/hr)
4	8.2E + 01	4.2E + 01	1.9E + 01
6	9.1E + 01	4.8E + 01	2.8E + 01
8	1.0E + 02	5.3E + 01	4.1E + 01
10	1.2E + 02	6.2E + 01	5.8E + 01
12	1.3E + 02	7.7E + 01	7.2E + 01
14	1.5E + 02	9.1E + 01	9.1E + 01
16	1.7E + 02	1.2E + 02	1.1E + 02
18	1.9E + 02	1.4E + 02	1.2E + 02
20	2.1E + 02	1.8E + 02	1.3E + 02
22	2.4E + 02	2.3E + 02	1.4E + 02
24	2.7E + 02	2.9E + 02	1.6E + 02
26	3.1E + 02	3.7E + 02	1.7E + 02
28	3.5E + 02	4.7E + 02	1.9E + 02
30	3.9E + 02	5.8E + 02	2.1E + 02
35	5.3E + 02	9.6E + 02	2.6E + 02
40	6.2E + 02	1.4E + 03	3.3E + 02
45	8.2E + 02	2.0E + 03	4.0E + 02

Terrain-adjusted effective stack height (m)	Noncomplex Terrain		Complex Terrain
	Urban (g/hr)	Rural (g/hr)	(g/hr)
50	1.1E + 03	2.6E + 03	4.8E + 02
55	1.3E + 03	3.5E + 03	6.2E + 02
60	1.6E + 03	4.6E + 03	7.7E + 02
65	2.0E + 03	6.2E + 03	9.1E + 02
70	2.3E + 03	7.2E + 03	1.1E + 03
75	2.5E + 03	8.6E + 03	1.2E + 03
80	2.9E + 03	1.0E + 04	1.3E + 03
85	3.3E + 03	1.2E + 04	1.4E + 03
90	3.7E + 03	1.4E + 04	1.6E + 03
95	4.2E + 03	1.7E + 04	1.8E + 03
100	4.8E + 03	2.1E + 04	2.0E + 03
105	5.3E + 03	2.4E + 04	2.3E + 03
110	6.2E + 03	2.9E + 04	2.5E + 03
115	7.2E + 03	3.5E + 04	2.8E + 03
120	8.2E + 03	4.1E + 04	3.2E + 03

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX III. Tier II Emission Rate Screening Limits for Free Chlorine and Hydrogen Chloride

Terrain-adjusted effective stack height (m)	Noncomplex terrain				Complex terrain	
	Values for urban areas		Values for rural areas		Values for use in urban and rural areas	
	Cl ₂ (g/hr)	HCl (g/hr)	Cl ₂ (g/hr)	HCl (g/hr)	Cl ₂ (g/hr)	HCl (g/hr)
4	8.2E + 01	1.4E + 03	4.2E + 01	7.3E + 02	1.9E + 01	3.3E + 02
6	9.1E + 01	1.6E + 03	4.8E + 01	8.3E + 02	2.8E + 01	4.9E + 02
8	1.0E + 02	1.8E + 03	5.3E + 01	9.2E + 02	4.1E + 01	7.1E + 02
10	1.2E + 02	2.0E + 03	6.2E + 01	1.1E + 03	5.8E + 01	1.0E + 03
12	1.3E + 02	2.3E + 03	7.7E + 01	1.3E + 03	7.2E + 01	1.3E + 03
14	1.5E + 02	2.6E + 03	9.1E + 01	1.6E + 03	9.1E + 01	1.6E + 03
16	1.7E + 02	2.9E + 03	1.2E + 02	2.0E + 03	1.1E + 02	1.6E + 03
18	1.9E + 02	3.3E + 03	1.4E + 02	2.5E + 03	1.2E + 02	2.0E + 03
20	2.1E + 02	3.7E + 03	1.8E + 02	3.1E + 03	1.3E + 02	2.3E + 03
22	2.4E + 02	4.2E + 03	2.3E + 02	3.9E + 03	1.4E + 02	2.4E + 03
24	2.7E + 02	4.8E + 03	2.9E + 02	5.0E + 03	1.6E + 02	2.8E + 03
26	3.1E + 02	5.4E + 03	3.7E + 02	6.5E + 03	1.7E + 02	3.0E + 03
28	3.5E + 02	6.0E + 03	4.7E + 02	8.1E + 03	1.9E + 02	3.4E + 03
30	3.9E + 02	6.9E + 03	5.8E + 02	1.0E + 04	2.1E + 02	3.7E + 03
35	5.3E + 02	9.2E + 03	9.6E + 02	1.7E + 04	2.6E + 02	4.6E + 03
40	6.2E + 02	1.1E + 04	1.4E + 03	2.5E + 04	3.3E + 02	5.7E + 03
45	8.2E + 02	1.4E + 04	2.0E + 03	3.5E + 04	4.0E + 02	7.0E + 03
50	1.1E + 03	1.8E + 04	2.6E + 03	4.6E + 04	4.8E + 02	8.4E + 03
55	1.3E + 03	2.3E + 04	3.5E + 03	6.1E + 04	6.2E + 02	1.1E + 04
60	1.6E + 03	2.9E + 04	4.6E + 03	8.1E + 04	7.7E + 02	1.3E + 04
65	2.0E + 03	3.4E + 04	6.2E + 03	1.1E + 05	9.1E + 02	1.6E + 04
70	2.3E + 03	3.9E + 04	7.2E + 03	1.3E + 05	1.1E + 03	1.8E + 04
75	2.5E + 03	4.5E + 04	8.6E + 03	1.5E + 05	1.2E + 03	2.0E + 04
80	2.9E + 03	5.0E + 04	1.0E + 04	1.8E + 05	1.3E + 03	2.3E + 04
85	3.3E + 03	5.8E + 04	1.2E + 04	2.2E + 05	1.4E + 03	2.5E + 04
90	3.7E + 03	6.6E + 04	1.4E + 04	2.5E + 05	1.6E + 03	2.9E + 04
95	4.2E + 03	7.4E + 04	1.7E + 04	3.0E + 05	1.8E + 03	3.2E + 04
100	4.8E + 03	8.4E + 04	2.1E + 04	3.6E + 05	2.0E + 03	3.5E + 04
105	5.3E + 03	9.2E + 04	2.4E + 04	4.3E + 05	2.3E + 03	3.9E + 04

110	6.2E + 03	1.1E + 05	2.9E + 04	5.1E + 05	2.5E + 03	4.5E + 04
115	7.2E + 03	1.3E + 05	3.5E + 04	6.1E + 05	2.8E + 03	5.0E + 04
120	8.2E + 03	1.4E + 05	4.1E + 04	7.2E + 05	3.2E + 03	5.6E + 04

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX IV. Reference Air Concentrations *

Constituent	CAS No.	RAC (ug/m)
Acetaldehyde	75-07-0	10
Acetonitrile	75-05-8	10
Acetophenone	98-86-2	100
Acrolein	107-02-8	20
Aldicarb	116-06-3	1
Aluminum Phosphide	20859-73-8	0.3
Allyl Alcohol	107-18-6	5
Antimony	7440-36-0	0.3
Barium	7440-39-3	50
Barium Cyanide	542-62-1	50
Bromomethane	74-83-9	0.8
Calcium Cyanide	592-01-8	30
Carbon Disulfide	75-15-0	200
Chloral	75-87-6	2
Chlorine (free)		0.4
2-Chloro-1,3-butadiene	126-99-8	3
Chromium III	16065-83-1	1000
Copper Cyanide	544-92-3	5
Cresole	1319-77-3	50
Cumene	98-82-8	1
Cyanide (free)	57-12-15	20
Cyanogen	480-19-5	30
Cyanogen Bromide	506-68-3	80
Di-n-butyl Phthalate	84-74-2	100
o-Dichlorobenzene	95-50-1	10
p-Dichlorobenzene	106-46-7	10
Dichlorodifluoromethane	75-71-8	200
2,4-Dichlorophenol	120-83-2	3
Diethyl Phthalate	84-66-2	800
Dimethoate	60-51-5	0.8
2,4-Dinitrophenol	51-28-5	2
Dinoseb	88-85-7	0.9
Diphenylamine	122-39-4	20
Endosulfan	115-29-1	0.05
Endrin	72-20-8	0.3
Fluorine	7782-41-4	50
Formic Acid	64-18-6	2000
Glycidyaldehyde	765-34-4	0.3
Hexachlorocyclopentadiene	77-47-4	5
Hexachlorophene	70-30-4	0.3

* FOOTNOTE: The RAC for other appendix VIII part 261 constituents not listed herein or in appendix V of this part is 0.1 ug/m³.

Constituent	CAS No.	RAC (ug/m)
Hydrocyanic Acid	74-90-8	20
Hydrogen Chloride	7647-01-1	7
Hydrogen Sulfide	7783-06-4	3
Isobutyl Alcohol	78-83-1	300
Lead	7439-92-1	0.09
Maleic Anhydride	108-31-6	100
Mercury	7439-97-6	0.3
Methacrylonitrile	126-98-7	0.1
Methomyl	16752-77-5	20
Methoxychlor	72-43-5	50
Methyl Chlorocarbonate	79-22-1	1000
Methyl Ethyl Ketone	78-93-3	80
Methyl Parathion	298-00-0	0.3
Nickel Cyanide	557-19-7	20
Nitric Oxide	10102-43-9	100
Nitrobenzene	98-95-3	0.8
Pentachlorobenzene	608-93-5	0.8
Pentachlorophenol	87-86-5	30
Phenol	108-95-2	30
M-Phenylenediamine	108-45-2	5
Phenylmercuric Acetate	62-38-4	0.075
Phosphine	7803-51-2	0.3
Phthalic Anhydride	85-44-9	2000
Potassium Cyanide	151-50-8	50
Potassium Silver Cyanide	506-61-6	200
Pyndine	110-86-1	1
Selenious Acid	7783-60-8	3
Selenoures	830-10-4	5
Silver	7440-22-4	3
Silver Cyanide	506-64-9	100
Sodium Cyanide	143-33-9	30
Strychnine	57-24-9	0.3
1,2,4,5-Tetrachlorobenzene	95-94-3	0.3
2,3,4,6-Tetrachlorophenol	58-90-2	30
Tetraethyl Lead	78-00-2	0.0001
Tetrahydrofuran	109-99-9	10
Thallic Oxide	1314-32-5	0.3
Thallium	7440-28-0	0.5
Thallium (I) Acetate	563-68-8	0.5
Thallium (I) Carbonate	6533-73-9	0.3
Thallium (I) Chloride	7791-12-0	0.3
Thallium (I) Nitrate	10102-45-1	0.5
Thallium Selerate	12039-52-0	0.5
Thallium (I) Sulfate	7446-18-6	0.075
Thiram	137-26-8	5
Toluene	108-88-3	300
1,2,4-Trichlorobenzene	120-82-1	20
Trichloromonofluoromethane	75-69-4	300
2,4,5-Trichlorophenol	95-95-4	100
Vanadium Pentoxide	1314-62-1	20
Warfarin	81-81-2	0.3

Constituent	CAS No.	RAC (ug/m)
Xylenes	1330-20-7	80
Zinc Cyanide	557-21-1	50
Zinc Phosphide	1314-84-7	0.3

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX V. Risk Specific Doses (10⁵)

Constituent	CAS No.	Unit risk (m ³ /ug)	RsD (ug/m ³)
Acrylamide	79-06-1	1.3E-03	7.7E-03
Acrylonitrile	107-13-1	6.8E-05	1.5E-01
Aldrin	309-00-2	4.9E-03	2.0E-03
Aniline	62-53-3	7.4E-06	1.4E + 00
Arsenic	7440-38-2	4.3E-03	2.3E-03
Benz(a)anthracene	56-55-3	8.9E-04	1.1E-02
Benzene	71-43-2	8.3E-06	1.2E + 00
Benzidine	92-87-5	6.7E-02	1.5E-04
Benzo(a)pyrene	50-32-8	3.3E-03	3.0E-03
Beryllium	7440-41-7	2.4E-03	4.2E-03
Bis(2-chloroethyl)ether	111-44-4	3.3E-04	3.0E-02
Bis(chloromethyl)ether	542-88-1	6.2E-02	1.6E-04
Bis(2-ethylhexyl)-phthalate	117-81-7	2.4E-07	4.2E + 01
1,3-Butadiene	108-99-0	2.8E-04	3.6E-02
Cadmium	7440-43-9	1.8E-03	5.6E-03
Carbon Tetrachloride	56-23-5	1.5E-05	6.7E-01
Chlordane	57-74-9	3.7E-04	2.7E-02
Chloroform	67-66-3	2.3E-05	4.3E-01
Chloromethane	74-87-3	3.6E-06	2.8E + 00
Chromium VI	7440-47-3	1.2E-02	8.3E-04
DDT	50-29-3	9.7E-05	1.0E-01
Dibenz(a,h)anthracene	53-70-3	1.4E-02	7.1E-04
1,2-Dibromo-3-chloropropane	96-12-8	6.3E-03	1.6E-03
1,2-Dibromoethane	106-93-4	2.2E-04	4.5E-02
1,1-Dichloroethane	75-34-3	2.6E-05	3.8E-01
1,2-Dichloroethane	107-06-2	2.6E-05	3.8E-01
1,1-Dichloroethylene	75-35-4	5.0E-05	2.0E-01
1,3-Dichloropropane	542-75-6	3.5E-01	2.9E-05
Dieldrin	60-57-1	4.6E-03	2.2E-03
Diethylstilbestrol	56-53-1	1.4E-01	7.1E-05
Dimethylnitrosamine	62-75-9	1.4E-02	7.1E-04
2,4-Dinitrotoluene	121-14-2	8.8E-05	1.1E-01
1,2-Diphenylhydrazine	122-66-7	2.2E-04	4.5E-02
1,4-Dioxane	123-91-1	1.4E-06	7.1E + 00
Epichlorohydrin	106-89-8	1.2E-06	8.3E + 00
Ethylene Oxide	75-21-8	1.0E-04	1.0E-01
Ethylene Dibromide	106-93-4	2.2E-04	4.5E-02
Formaldehyde	50-00-0	1.3E-05	7.7E-01
Heptachlor	76-44-8	1.3E-03	7.7E-03
Heptachlor Epoxide	1024-57-3	2.6E-03	3.8E-03
Hexachlorobenzene	118-74-1	4.9E-04	2.0E-02
Hexachlorobutadiene	87-68-3	2.0E-05	5.0E-01
Alpha-hexachloro-cyclohexane	319-84-6	1.8E-03	5.6E-03

Constituent	CAS No.	Unit risk (m ³ /ug)	RsD (ug/m ³)
Beta-hexachloro-cyclohexane	319-85-7	5.3E-04	1.9E-02
Gamma-hexachloro-cyclohexane	58-89-9	3.8E-04	2.6E-02
Hexachlorocyclohexane, Technical		5.1E-04	2.0E-02
Hexachlorodibenzop-dioxin(1,2 Mixture)		1.3E+0	7.7E-06
Hexachloroethane	67-72-1	4.0E-06	2.5E+00
Hydrazine	302-01-2	2.9E-03	3.4E-03
Hydrazine Sulfate	302-01-2	2.9E-03	3.4E-03
3-Methylcholanthrene	56-49-5	2.7E-03	3.7E-03
Methyl Hydrazine	80-34-4	3.1E-04	3.2E-02
Methylene Chloride	75-09-2	4.1E-06	2.4E+00
4,4'-Methylene-bis-2-chloroaniline	101-14-4	4.7E-05	2.1E-01
Nickel	7440-02-0	2.4E-04	4.2E-02
Nickel Refinery Dust	7440-02-0	2.4E-04	4.2E-02
Nickel Subulfide	1,2035-72-2	4.8E-04	2.1E-02
2-Nitropropane	79-48-9	2.7E-02	3.7E-04
N-Nitroso-n-butylamine	924-16-3	1.6E-03	6.3E-03
N-Nitroso-n-methylurea	684-93-5	8.6E-02	1.2E-04
N-Nitrosodiethylamine	55-18-5	4.3E-02	2.3E-04
N-Nitrosopyrrolidine	930-55-2	6.1E-04	1.6E-02
Pentachloronitro-benzene	82-68-8	7.3E-05	1.4E-01
PCBs	1336-36-3	1.2E-03	8.3E-03
Pronamide	23950-58-5	4.6E-06	2.2E+00
Reserpine	50-55-5	3.0E-03	3.3E-03
2,3,7,8-Tetrachloro-dibenzo-p-dioxin	1746-01-6	4.5E+01	2.2E-07
1,1,2,2-Tetrachloroethane	79-34-5	5.8E-05	1.7E-01
Tetrachloroethylene	127-18-4	4.8E-07	2.1E+01
Thioures	62-58-8	5.5E-04	1.8E-02
1,1,2-Trichloroethane	79-00-5	1.6E-05	6.3E-01
Trichloroethylene	79-01-6	1.3E-06	7.7E+00
2,4,6-Trichlorophenol	88-06-2	5.7E-06	1.8E+00
Toxaphene	8001-35-2	3.2E-04	3.1E-02
Vinyl Chloride	75-01-4	7.1E-06	1.4E+00

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX VI. Stack Plume Rise

[Estimated Plume Rise (in Meters) Based on Stock Exit Flow Rate and Gas Temperature]

Flow rate (m ³ /s)	Exhaust Temperature (K°)										
	<325	325-349	350-399	400-449	450-499	500-599	600-699	700-799	800-999	1000-1499	>1499
<0.5	0	0	0	0	0	0	0	0	0	0	0
0.5-0.9	0	0	0	0	0	0	0	0	1	1	1
1.0-1.9	0	0	0	0	1	1	2	3	3	3	4
2.0-2.9	0	0	1	3	4	4	6	6	7	8	9
3.0-3.9	0	1	2	5	6	7	9	10	11	12	13
4.0-4.9	1	2	4	6	8	10	12	13	14	15	17
5.0-7.4	2	3	5	8	10	12	14	16	17	19	21
7.5-9.9	3	5	8	12	15	17	20	22	22	23	24
10.0-12.4	4	6	10	15	19	21	23	24	25	26	27
12.5-14.9	4	7	12	18	22	23	25	26	27	28	29
15.0-19.9	5	8	13	20	23	24	26	27	28	29	31

Flow rate (m ³ /s)	<325	325- 349	350- 399	400- 449	450- 499	500- 599	600- 699	700- 799	800- 999	1000- 1499	>1499
20.0-24.9	6	10	17	23	25	27	29	30	31	32	34
25.0-29.9	7	12	20	25	27	29	31	32	33	35	36
30.0-34.9	8	14	22	26	29	31	33	35	36	37	39
35.0-39.9	9	16	23	28	30	32	35	36	37	39	41
40.0-49.9	10	17	24	29	32	34	36	38	39	41	42
50.0-59.9	12	21	26	31	34	36	39	41	42	44	46
60.0-69.9	14	22	27	33	36	39	42	43	45	47	49
70.0-79.9	16	23	29	35	38	41	44	46	47	49	51
80.0-89.9	17	25	30	36	40	42	46	48	49	51	54
90.0-99.9	19	26	31	38	42	44	48	50	51	53	56
100.0-119.9	21	26	32	39	43	46	49	52	53	55	58
120.0-139.9	22	28	35	42	46	49	52	55	56	59	61
140.0-159.9	23	30	36	44	48	51	55	58	59	62	65
160.0-179.9	25	31	38	46	50	54	58	60	62	65	67
180.0-199.9	26	32	40	48	52	56	60	63	65	67	70
>199.9	26	33	41	49	54	58	62	65	67	69	73

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX VII Health-Based Limits For Exclusion of Waste-Derived Residues*

METALS-TCLP EXTRACT CONCENTRATION LIMITS

Constituent	CAS No.	Concentration Limits (mg/L)
Antimony	7440-36-0	1 × E+00
Arsenic	7440-38-2	5 × E+00
Barium	7440-39-3	1 × E+02
Beryllium	7440-41-7	7 × E-03
Cadmium	7440-43-9	1 × E+00
Chromium	7440-47-3	5 × E+00
Lead	7439-92-1	5 × E+00
Mercury	7439-97-6	2 × E-01
Nickel	7440-02-0	7 × E+01
Selenium	7782-49-2	1 × E+00
Silver	7440-22-4	5 × E+00
Thallium	7440-28-0	7 × E+00

Nonmetals-Residue Concentration Limits

Constituent	CAS No.	Concentration limits for residues (mg/kg)
Acetonitrile	75-05-8	2 × E-01
Acetophenone	98-86-2	4 × E+00
Acrolein	107-02-8	5 × E-01
Acrylamide	79-06-1	2 × E-04
Acrylonitrile	107-13-1	7 × E-04
Aldrin	309-00-2	2 × E-05
Allyl alcohol	107-18-6	2 × E-01
Aluminum phosphide	20859-73-8	1 × E-02
Aniline	62-53-3	6 × E-02
Barium cyanide	542-62-1	1 × E+00
Benz(a)anthracene	56-55-3	1 × E-04
Benzene	71-43-2	5 × E-03
Benzidine	92-87-5	1 × E-06

Constituent	CAS No.	Concentration limits for residues (mg/kg)
Bis(2-chloroethyl) ether	111-44-4	3 × E-04
Bis(chloromethyl) ether	542-88-1	2 × E-06
Bis(2-ethylhexyl) phthalate	117-81-7	3 × E+01
Bromoform	75-25-2	7 × E-01
Calcium cyanide	592-01-8	1 × E-06
Carbon disulfide	75-15-0	4 × E+00
Carbon tetrachloride	56-23-5	5 × E-03
Chlordane	57-74-9	3 × E-04
Chlorobenzene	108-90-7	1 × E+00
Chloroform	67-66-3	6 × E-02
Copper cyanide	544-92-3	2 × E-01
Cresole (Cresylic acid)	1319-77-3	2 × E+00
Cyanogen	460-19-5	1 × E-00
DDT	50-29-3	1 × E-03
Dibenz(a, h)-anthracene	53-70-3	7 × E-06
1, 2-Dibromo-3-chloropropane	96-12-8	2 × E-05
p-Dichlorobenzene	106-46-7	7.5 × E-02
Dichlorodifluoromethane	75-71-8	7 × E+00
1,1-Dichloroethylene	75-35-4	5 × E-03
2,4-Dichlorophenol	120-83-2	1 × E-01
1,3-Dichloropropene	542-75-6	1 × E-03
Dieldrin	60-57-1	2 × E-05
Diethyl phthalate	84-66-2	3 × E+01
Diethylstilbestrol	56-53-1	7 × E-07
Dimethoate	60-51-5	3 × E-02
2,4-Dinitrotoluene	121-14-2	5 × E-04
Diphenylamine	122-39-4	9 × E-01
1,2-Diphenylhydrazine	122-66-7	5 × E-04
Endosulfan	115-29-7	2 × E-03
Endrin	72-20-8	2 × E-04
Epichlorohydrin	106-89-8	4 × E-02
Ethylene dibromide	106-93-4	4 × E - 07
Ethylene oxide	75-21-8	3 × E - 04
Fluorine	7782-41-4	4 × E + 00
Formic acid	64-18-6	7 × E + 01
Heptachlor	76-44-8	8 × E - 05
Heptachlor epoxide	1024-57-3	4 × E - 05
Hexachlorobenzene	118-74-1	2 × E - 04
Hexachlorobutadiene	87-68-3	5 × E - 03
Hexachlorocyclopentadiene	77-47-4	2 × E - 01
Hexachlorodibenzo-p-dioxins	19408-74-3	6 × E - 08
Hexachloroethane	87-72-1	3 × E - 02
Hydrazine	302-01-1	1 × E - 04
Hydrogen cyanide	74-90-8	7 × E - 05
Hydrogen sulfide	7783-06-4	1 × E - 06
Isobutyl alcohol	78-83-1	1 × E + 01
Methomyl	16752-77-5	1 × E + 00
Methoxychlor	72-43-5	1 × E - 01
3-Methylcholenthrone	56-49-5	4 × E - 05
4,4'-Methylenebis(2-chloroaniline)	101-14-4	2 × E 03
Methylene chloride	75-09-2	5 × E - 02

Constituent	CAS No.	Concentration limits for residues (mg/kg)
Methyl ethyl ketone (MEK)	78-93-3	2 × E + 00
Methyl hydrazine	80-34-4	3 × E - 04
Methyl parathion	298-00-0	2 × E - 02
Naphthalene	91-20-3	1 × E + 01
Nickel cyanide	557-19-7	7 × E - 01
Nitric oxide	10102-43-9	4 × E + 00
Nitrobenzene	98-95-3	2 × E - 02
N-Nitrosodi-n-butylamine	924-16-3	6 × E - 05
N-Nitrosodiethylamine	55-18-5	2 × E - 06
N-Nitroso-N-methylurea	684-93-5	1 × E - 07
N-Nitrosopyrrolidine	930-55-2	2 × E - 04
Pentachlorobenzene	608-93-5	3 × E - 02
Pentachloronitrobenzene (PCNB)	82-68-8	1 × E - 01
Pentachlorophenol	87-88-5	1 × E - 00
Phenol	108-95-2	1 × E + 00
Phenylmercury acetate	62-38-4	3 × E-03
Phosphine	7803-51-2	1 × E-02
Polychlorinated biphenyls, N.O.S.	1336-36-3	5 × E-05
Potassium cyanide	151-50-8	2 × E + 00
Potassium silver cyanide	506-61-6	7 × E + 00
Pronamide	23950-58-5	3 × E + 00
Pyridine	110-86-1	4 × E-02
Reserpine	50-55-5	3 × E-05
Selenoures	630-10-4	2 × E-01
Silver cyanide	506-64-9	4 × E + 00
Sodium cyanide	143-33-9	1 × E + 00
Strychnine	57-24-9	1 × E-02
1,2,4,5-Tetrachlorobenzene	95-94-3	1 × E-02
1,1,2,2-tetrachloroethane	79-34-5	2 × E-03
Tetrachloroethylene	127-18-4	7 × E-01
2,3,4,6-Tetrachlorophenol	58-90-2	1 × E-02
Tetraethyl lead	78-00-2	4 × E-06
Thiourea	62-56-6	2 × E-04
Toluene	108-88-3	1 × E + 01
Toxaphene	8001-35-2	5 × E-03
1,1,2-Trichloroethane	79-00-5	6 × E-03
Trichloroethylene	79-01-6	5 × E-03
Trichloromonofluoromethane	75-69-4	1 × E + 01
2,4,5-Trichlorophenol	95-95-4	4 × E + 00
2,4,6-Trichlorophenol	88-06-2	4 × E + 00
Venadium pentoxide	1314-62-1	7 × E-01
Vinyl chloride	75-01-4	2 × E-03

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993; amended by State Register Volume 18, Issue No. 12, eff December 23, 1994.

* Note 1: The health-based concentration limits for Appendix VIII part 261 constituents for which a health-based concentration is not provided below is 2 × E-06 mg/kg.

Note 2: The levels specified in this appendix and the default level of 0.002 micrograms per kilogram or the level of detection for constituents as identified in Note 1 of this appendix are administratively stayed under the condition, for those constituents specified in § 266.112(b)(1), that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in § 268.43 for F039 nonwastewaters. See § 266.112(b)(2)(i).

APPENDIX VIII. Organic Compounds for which Residues must be Analyzed

PICs Found in Stack Effluents

Volatiles	Semivolatiles
Benzene	Bis(2-ethylhexyl)phthalate
Toluene	Naphthalene
Carbon tetrachloride	Phenol
Chloroform	Diethyl phthalate
Methylene chloride	Butyl benzyl phthalate
Trichloroethylene	2,4-Dimethylphenol
Tetrachloroethylene	o-Dichlorobenzene
1,1,1-Trichloroethane	m-Dichlorobenzene
Chlorobenzene	p-Dichlorobenzene
cis-1,4-Dichloro-2-butene	Hexachlorobenzene
Bromochloromethane	2,4,6-Trichlorophenol
Bromodichloromethane	Fluoranthene
Bromoform	o-Nitrophenol
Bromomethane	1,2,4-Trichlorobenzene
Methylene bromide	o-Chlorophenol
Methyl ethyl ketone	Pentachlorophenol
	Pyrene
	Dimethyl phthalate
	Mononitrobenzene
	2,6-Toluene diisocyanate
	Polychlorinated dibenzo-p-dioxins
	polychlorinated dibenzo-furans ¹

¹ Analyses for polychlorinated dibenzo-p-dioxins and poly-chlorinated dibenzo-furans are required only for residues collected from areas downstream of the combustion chamber (e.g., ductwork, boiler tubes, heat exchange surfaces, air pollution control devices, etc.).

NOTE TO TABLE: Analysis is not required for those compounds that do not have an established F039 nonwastewater concentration limit.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993. Amended by State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003.

Appendix IX. Methods Manual for Compliance With the BIF Regulations Burning Hazardous Waste in Boilers and Industrial Furnace

Table of Contents

1.0	Introduction
2.0	Performance Specifications for Continuous Emission Monitoring Systems
2.1	Performance Specifications for Continuous Emission Monitoring of Carbon Monoxide and Oxygen for Incinerators, Boilers, and industrial Furnaces Burning Hazardous Waste
2.2	Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces
3.0	Sampling and Analytical Methods
3.1	Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes
3.2	Determination of Hexavalent Chromium Emissions from Stationary Sources (Method Cr + 6)
3.3	Measurement of HCl and Cl ₂
3.3.1	Isokinetic HCl/Cl ₂ Emission Sampling Train (Method 0050)
3.3.2	Midget Impinger HCl/Cl ₂ Emission Sampling Train (Method 0051)

3.3.3	Protocol for Analysis of Samples from HCl/Cl ₂ Emission Sampling Train (Method 9057)
3.4	Determination of Polychlorinated Dibenzo-p-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) from Stationary Sources (Method 23)
3.5	Sampling for Aldehyde and Ketone Emissions from Stationary Sources (Method 0011)
3.6	Analysis for Aldehydes and Ketones by High Performance Liquid Chromatography (HPLC) (Method 0011A)
4.0	Procedure for Estimating the Toxicity Equivalence of Chlorinated Dibenzo-P-Dioxin and Dibenzofuran Congeners
5.0	Hazardous Waste Combustion Air Quality Screening Procedure
6.0	Simplified Land Use Classification Procedure for Compliance With Tier I and Tier II Limits
7.0	Statistical Methodology for Beville Residue Determinations
8.0	Procedures for Determining Default Values for Air Pollution Control System Removal Efficiencies
8.1	APCS RE Default Values for Metals
8.2	APCS RE Default Values for HCl and Cl ₂
8.3	APCS RE Default Values for Ash
8.4	References
9.0	Procedures for Determining Default Values for Partitioning of Metals, Ash, and Total Chloride/Chlorine
9.1	Partitioning Default Value for Metals
9.2	Special Procedures for Chlorine, HCl, and Cl ₂ ,
9.3	Special Procedures for Ash
9.4	Use of Engineering Judgement to Estimate Partitioning and APCS RE Values
9.5	Restrictions on Use of Test Data
10.0	Alternate Methodology for Implementing Metals Controls
10.1	Applicability
10.2	Introduction
10.3	Basis
10.4	Overview
10.5	Implementation Procedures
10.6	Precompliance Procedures
Appendix A	Statistics

Section 1.0. INTRODUCTION

This document presents required methods for demonstrating compliance with U.S. Environmental Protection Agency regulations for boilers and industrial furnaces (BIFs) burning hazardous waste (see part 266, subpart H). Included in this document are:

1. Performance Specifications for Continuous Emission Monitoring (CEM) of Carbon Monoxide, Oxygen, and Hydrocarbons in Stack Gases.
2. Sampling and Analytical (S&A) Methods for Multiple Metals, Hexavalent Chromium, HCl and Chlorine, Polychlorinated Dibenzo-p-dioxins and Dibenzofurans, and Aldehydes and Ketones.
3. Procedures for Estimating the Toxicity Equivalency of Chlorinated Dibenzo-p-dioxin and Dibenzofuran Congeners.
4. Hazardous Waste Combustion Air Quality Screening Procedures (HWCAQSP).
5. Simplified Land Use Classification Procedure for Compliance with Tier I and Tier II Limits.
6. Statistical Methodology for Beville Residue Determinations.
7. Procedures for Determining Default Values for Air Pollution Control System Removal Efficiencies.
8. Procedures for Determining Default Values for Partitioning of Metals, Ash, and Total Chloride/Chlorine.
9. Alternate Methodology for Implementing Metals Controls.

Additional methods referenced in subpart H of part 266 but not included in this document can be found in 40 CFR parts 60 and 61, and “Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods” (SW-846).

The CEM performance specifications of section 2.0, the S&A methods of section 3.0 and the toxicity equivalency procedure for dioxins and furans of section 4.0 are required procedures for determining compliance with BIF regulations. The CEM performance specifications and the S&A methods are interim. The finalized CEM performance specifications and methods will be published in SW-846 or 40 CFR parts 60 and 61.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Section 2.0. PERFORMANCE SPECIFICATIONS FOR CONTINUOUS EMISSION MONITORING SYSTEMS

2.1 Performance Specifications for Continuous Emission Monitoring of Carbon Monoxide and Oxygen for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste

2.1.1 Applicability and Principle

2.1.1.1 **Applicability.** These performance specifications apply to carbon monoxide (CO) and oxygen (O₂) continuous emission monitoring systems (CEMSs) installed on incinerators, boilers, and industrial furnaces burning hazardous waste. The specifications include procedures which are intended to be used to evaluate the acceptability of the CEMS at the time of its installation or whenever specified in regulations or permits. The procedures are not designed to evaluate CEMS performance over an extended period of time. The source owner or operator is responsible for the proper calibration, maintenance, and operation of the CEMS at all times.

2.1.1.2 **Principle.** Installation and measurement location specifications, performance and equipment specifications, test and data reduction procedures, and brief quality assurance guidelines are included in the specifications. Calibration drift, relative accuracy, calibration error, and response time tests are conducted to determine conformance of the CEMS with the specifications.

2.1.2 Definitions

2.1.2.1 **Continuous Emission Monitoring System (CEMS).** A continuous monitor is one in which the sample to be analyzed passes the measurement section of the analyzer without interruption, and which evaluates the detector response to the sample at least once each 15 seconds and computes and records the results at least every 60 seconds. A CEMS consists of all the equipment used to acquire data and includes the sample extraction and transport hardware, the analyzer(s), and the data recording/processing hardware and software.

2.1.2.2 **Monitoring System Types.** The specifications require CEMSs capable of accepting calibration gases. Alternative system designs may be used if approved by the Department. There are two basic types of monitoring systems: extractive and in-situ.

2.1.2.2.1 **Extractive.** Systems that use a pump or other mechanical, pneumatic, or hydraulic means to draw a sample of the stack or flue gas and convey it to a remotely located analyzer.

2.1.2.2.2 **In-situ.** Systems that perform an analysis without removing a sample from the stack. Point in-situ analyzers place the sensing or detecting element directly in the flue gas stream. Cross-stack in-situ analyzers measure the parameter of interest by placing a source beam on one side of the stack and the detector (in single-pass instruments) or a retroreflector (in double-pass instruments) on the other side, and measuring the parameter of interest (e.g., CO) by the attenuation of the beam by the gas in its path.

2.1.2.3 **Instrument Measurement Range.** The difference between the minimum and maximum concentration that can be measured by a specific instrument. The minimum is often stated or assumed to be zero and the range expressed only as the maximum.

2.1.2.4 **Span or Span Value.** Full scale instrument measurement range.

2.1.2.5 **Calibration Drift (CD).** The difference in the CEMS output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment takes place. A CD test is performed to demonstrate the stability of the CEMS calibration over time.

2.1.2.6 Response Time. The time interval between the start of a step change in the system input (e.g., change of calibration gas) and the time when the data recorder displays 95 percent of the final value.

2.1.2.7 Accuracy. A measure of agreement between a measured value and an accepted or true value, expressed as the percentage difference between the true and measured values relative to the true value. For these performance specifications, accuracy is checked by conducting a calibration error (CE) test and a relative accuracy (RA) test. Certain facilities, such as those using solid waste or batch-fed processes, may observe long periods of almost no CO emissions with brief, high-level CO emission spikes. These facilities, as well as facilities whose CO emissions never exceed 5-10 ppm, may need to be exempted from the RA requirement because the RA test procedure cannot ensure acquisition of meaningful test results under these conditions. An alternative procedure for accuracy determination is described in section 2.1.9.

2.1.2.8 Calibration Error (CE). The difference between the concentration indicated by the CEMS and the known concentration of the cylinder gas. A CE test procedure is performed to document the accuracy and linearity of the monitoring equipment over the entire measurement range.

2.1.2.9 Relative Accuracy (RA). A comparison of the CEMS response to a value measured by a performance test method (PTM). The RA test is used to validate the calibration technique and verify the ability of the CEMS to provide representative and accurate measurements.

2.1.2.10 Performance Test Method (PTM). The sampling and analysis procedure used to obtain reference measurements for comparison to CEMS measurements. The applicable test methods are Method 10, 10A, or 10B (for the determination of CO) and Method 3 or 3A (for the determination of O₂). These methods are found in 40 CFR part 60, appendix A.

2.1.2.11 Performance Specification Test (PST) Period. The period during which CD, CE, response time, and RA tests are conducted.

2.1.2.12 Centroidal Area. A concentric area that is geometrically similar to the stack or duct cross section and is no greater than 1 percent of the stack or duct cross-sectional area.

2.1.3 Installation and Measurement Location Specifications

2.1.3.1 CEMS Installation and Measurement Locations. The CEMS shall be installed in a location in which measurements representative of the source's emissions can be obtained. The optimum location of the sample interface for the CEMS is determined by a number of factors, including ease of access for calibration and maintenance, the degree to which sample conditioning will be required, the degree to which it represents total emissions, and the degree to which it represents the combustion situation in the firebox. The location should be as free from in-leakage influences as possible and reasonably free from severe flow disturbances. The sample location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs and at least 0.5 diameter upstream from the exhaust or control device. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, method 1, section 2.1. If these criteria are not achievable or if the location is otherwise less than optimum, the possibility of stratification should be checked as described in Section 2.1.3.3 to determine whether the location would cause failure of the relative accuracy test.

2.1.3.1.1 For extractive or point in-situ CEMSs, the measurement point should be within or centrally located over the centroidal area of the stack or duct cross section.

2.1.3.1.2 For cross-stack CEMSs, the effective measurement path should (1) have at least 70 percent of the path within the inner 50 percent of the stack or duct cross-sectional area or (2) be centrally located over any part of the centroidal area.

2.1.3.1.3 Both the CO and O₂ monitors should be installed at the same general location. If this is not possible, they may be installed at different locations if the effluent gases at both sample locations are not stratified and there is no in-leakage of air between sampling locations.

2.1.3.2 Performance Test Method (PTM) Measurement Location and Traverse Points.

2.1.3.2.1 Select an accessible PTM measurement point at least two equivalent diameters downstream from the nearest control device, the point of CO generation, or other point at

which a change in the CO concentration may occur, and at least a half equivalent diameter upstream from the effluent exhaust or control device. When pollutant concentration changes are due solely to diluent leakage (e.g., air heater leakages) and CO and O₂ are simultaneously measured at the same location, one half diameter may be used in place of two equivalent diameters. The CEMS and PTM locations need not be the same.

2.1.3.2.2 Select traverse points that ensure acquisition of representative samples over the stack or duct cross section. At a minimum, establish a measurement line that passes through the centroidal area in the direction of any expected stratification. If this line interferes with the CEMS measurements, displace the line up to 30 cm (or 5 percent of the equivalent diameter of the cross section, whichever is less) from the centroidal area. Locate three traverse points at 17, 50, and 83 percent of the measurement line. If the measurement line is no longer than 2.4 meters and pollutant stratification is not expected, the tester may choose to locate the three traverse points on the line at 0.4, 1.2, and 2.0 meters from the stack or duct wall. This option must not be used at a site located within eight equivalent diameters downstream of a flow disturbance. The tester may select other traverse points, provided that they can be shown to the satisfaction of the Administrator to provide a representative sample over the stack or duct cross-section. Conduct all necessary PTM tests within 3 cm of the selected traverse points. Sampling must not be performed within 3 cm of the duct or stack inner wall.

2.1.3.3 Stratification Test Procedure. Stratification is defined as a difference in excess of 10 percent between the average concentration in the duct or stack and the concentration at any point more than 1.0 meter from the duct or stack wall. To determine whether effluent stratification exists, a dual probe system should be used to determine the average effluent concentration while measurements at each traverse point are being made. One probe, located at the stack or duct centroid, is used as a stationary reference point to indicate the change in effluent concentration over time. The second probe is used for sampling at the traverse points specified in method 1, appendix A, 40 CFR part 60. The monitoring system samples sequentially at the reference and traverse points throughout the testing period for five minutes at each point.

2.1.4 CEMS Performance and Equipment Specifications

Table 2.1-1 summarizes the performance specifications for the CEMSs. Two sets of standards for CO are given; one for low-range and another for high-range measurements. The high-range specifications relate to measurement and quantification of short duration high concentration peaks, while the low-range specifications relate to the overall average operating condition of the burning device. The dual-range specifications can be met by using (1) one analyzer for each range, (2) a dual range unit, or (3) a single measurement range instrument capable of meeting both specifications with a single unit. Adjustments cannot be made to the analyzer between determinations of low-and high-level accuracy within the single measurement range. In the second case, when the concentration exceeds the span of the lower range, the data acquisition system recorder shall switch to the high range automatically.

2.1.4.1 CEMS Span Value. In order to measure high and low concentrations with the same or similar degree of accuracy, the maximum ranges (span values) are specified for low and high range analyzers. The span values are listed in Table 2.1-2. Tier I and Tier II format definitions are established in part 266, subpart H.

Table 2.1-1-Performance Specifications of CO and O₂ Monitors

Parameter	CO monitors		O ₂ monitors
	Low range	High range	
Calibration drift 24 hours	<6 ppm ¹	<90 ppm	<0.5% O ₂
Calibration error	<10 ppm ¹	<150 ppm	<0.5% O ₂
Response time	<2 min	<2 min	<2 min
Relative accuracy ²	(³)	(³)	(incorporated in CO RA calculation)

¹ For Tier II, CD and CE are 3% and 5% or twice the permit limit, respectively.

² Expressed as the sum of the mean absolute value plus the 95% confidence interval of a series of measurements.

³ The greater of 10% of PTM or 10 ppm.

Table 2.1-2-CEMS Span Values for CO and O₂ Monitors

	CO monitors		O ₂ monitors (percent)
	Low range(ppm)	High range (ppm)	
Tier I rolling average format.	200	3,000	25
Tier II rolling average format.	2 × permit	3,000	25

2.1.4.2 Daily Calibration Gas Values. The owner or operator must choose calibration gas concentrations (or calibration filters for in-situ systems) that include zero and high-level calibration values for the daily calibration checks. For a single measurement range monitor, three CO calibration gas concentrations (or calibration filters for in-situ systems) shall be used, i.e., the zero and high-level concentrations of the low-range CO analyzer and the high-level concentration of the high-range CO analyzer.

2.1.4.2.1 The zero level for the CO or O₂ analyzer may be between zero and 20 percent of the span value, e.g., 0–40 ppm for low-range CO analyzer, 0–600 ppm for the high-range CO analyzer, and 0–5 percent for the O₂ analyzer (for Tier I).

2.1.4.2.2 The high-level concentration for the CO or O₂ analyzer shall be between 50 and 90 percent of the span value, i.e., 100-180 ppm for the low-range CO analyzer, 1500–2700 ppm for the high-range CO analyzer, and 12.5-22.5 percent O₂ for the O₂ analyzer.

2.1.4.3 Data Recorder Scale. The strip chart recorder, computer, or digital recorder must be capable of recording all readings within the CEMS's measurement range and shall have a resolution of 0.5 percent of span value, i.e., 1 ppm CO for low-range CO analyzer, 15 ppm CO for high-range CO analyzer, and 0.1 percent O₂ for the O₂ analyzer.

2.1.4.4 Response Time. The response time for the CO or O₂ monitor shall not exceed 2 minutes to achieve 95 percent of the final stable value.

2.1.4.5 Calibration Drift. The CEMS must allow the determination of CD at the zero and high-level values. The CD must be determined separately for CO and O₂ monitors in terms of concentration. The CO CEMS calibration response must not drift or deviate from the reference value of the calibration gas (or calibration filters for in-situ systems) by more than 3 percent of the span value after each 24-hour period of the 7-day test, i.e., 6 ppm CO for the low-range analyzer (Tier I) and 90 ppm for the high-range analyzer, at both zero and high levels. The O₂ monitor calibration response must not drift or deviate from the reference value by more than 0.5 percent O₂ at both zero and high levels.

2.1.4.6 Relative Accuracy. The result of the RA test of the CO CEMS (which incorporates the O₂ monitor) must be no greater than 10 percent of the mean value of the PTM results or must be within 10 ppm CO of the PTM results, whichever is less restrictive. The ppm CO concentration shall be corrected to 7 percent O₂ before calculating the RA.

2.1.4.7 Calibration Error. The mean difference between the CEMS and reference values at all three test points (see Table 2.1-3) must be no greater than 5 percent of span value for CO monitors (i.e., 10 ppm CO for low range Tier I CO analyzers and 150 ppm CO for high range CO analyzers) and 0.5 percent for O₂ analyzers.

2.1.4.8 Measurement and Recording Frequency. The sample to be analyzed shall pass through the measurement section of the analyzer without interruption. The detector shall measure the sample concentration at least once every 15 seconds. An average emission rate shall be computed and recorded at least once every 60 seconds.

2.1.4.9 Hourly Rolling Average Calculation. The CEMS shall calculate every minute an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

2.1.4.10 Retest. If the CEMS produces results within the specified criteria, the test is successful. If the CEMS does not meet one or more of the criteria, the necessary corrections must be made and the performance tests repeated.

2.1.5 Test Periods

2.1.5.1 Pretest Preparation Period. Install the CEMS, prepare the PTM test site according to the specifications in section 2.1.3, and prepare the CEMS for operation and calibration according to the manufacturer's written instructions. A pretest conditioning period similar to that of the 7-day CD test is recommended to verify the operational status of the CEMS.

2.1.5.2 Calibration Drift Test Period. While the facility is operating under normal conditions, determine the CD at 24-hour intervals for seven consecutive days according to the procedure given in section 2.1.6.1. All CD determinations must be made following a 24-hour period during which no unscheduled maintenance, repair, or adjustment takes place. If the combustion unit is taken out of service during the test period, record the onset and duration of the downtime and continue the calibration drift test when the unit resumes operation.

2.1.5.3 Relative Accuracy Test Period. Conduct the RA test according to the procedure in section 2.1.6.4 while the facility is operating under normal conditions. RA testing for CO and O₂ shall be conducted simultaneously so that the results can be calculated for CO corrected to 7 percent O₂. The RA test shall be conducted during the CD test period. It is emphasized that during the CD test period, no adjustments or repairs may be made to the CEMS other than routine calibration adjustments performed immediately following the daily CD determination.

2.1.5.4 Calibration Error Test and Response Time Test Periods. Conduct the CE and response time tests during the CD test period.

2.1.6 Performance Specification Test Procedures

2.1.6.1 Calibration Drift Test.

2.1.6.1.1 Sampling Strategy. Conduct the CD test for all monitors at 24-hour intervals for seven consecutive days using calibration gases at the two (or three, if applicable) concentration levels specified in section 2.1.4.2. Introduce the calibration gases into the sampling system as close to the sampling probe outlet as practical. The gas shall pass through all filters, scrubbers, conditioners, and other CEMS components used during normal sampling. If periodic automatic or manual adjustments are made to the CEMS zero and calibration settings, conduct the CD test immediately before these adjustments, or conduct it in such a way that the CD can be determined. Record the CEMS response and subtract this value from the reference (calibration gas) value. To meet the specification, none of the differences shall exceed the limits specified in Table 2.1-1.

2.1.6.1.2 Calculations. Summarize the results on a data sheet. An example is shown in Figure 2.1-1. Calculate the differences between the CEMS responses and the reference values.

2.1.6.2 Response Time. Check the entire CEMS including sample extraction and transport, sample conditioning, gas analyses, and the data recording.

2.1.6.2.1 Introduce zero gas into the system. For extractive systems, introduce the calibration gases at the probe as near to the sample location as possible. For in-situ system, introduce the zero gas at a point such that all components active in the analysis are tested. When the system output has stabilized (no change greater than 1 percent of full scale for 30 seconds), switch to monitor stack effluent and wait for a stable value. Record the time (upscale response time) required to reach 95 percent of the final stable value.

2.1.6.2.2 Next, introduce a high-level calibration gas and repeat the above procedure. Repeat the entire procedure three times and determine the mean upscale and downscale response times. The longer of the two means is the system response time.

2.1.6.3 Calibration Error Test Procedure.

2.1.6.3.1 Sampling Strategy. Challenge each monitor (both low- and high-range CO and O₂) with zero gas and EPA Protocol 1 cylinder gases at three measurement points within the ranges specified in Table 2.1-3.

Table 2.1-3-Calibration Error Concentration Ranges for Tier I

GAS Concentration Ranges			
Measurement point	CO ₂ ppm		O ₂ percent
	Low range ¹	High range	
1	0-40	0-600	0-2
2	60-80	900-1200	8-10
3	140-160	2100-2400	14-16

FOOTNOTE: ¹ For Tier II, the CE specifications for the low-range CO CEMS are 0-20%, 30-40%, and 70-80% of twice the permit limit.

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER:	SPAN:

LOW RANGE
HIGH RANGE

	DAY	DATE	TIME	CALIBRATION VALUE	MONITOR RESPONSE	DIFFER- ENCE	PERCENT OF SPAN*
ZERO/ LOW LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						
HIGH LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						

Figure 2.1-1 Calibration Drift Determination

* Acceptance Criteria: ≤ 5% of span each day for seven days.

2.1.6.3.1.1 If a single measurement range is used, the calibration gases used in the daily CD checks (if they are Protocol 1 cylinder gases and meet the criteria in section 2.1.6.3.1) may be used for determining CE.

2.1.6.3.1.2 Operate each monitor in its normal sampling mode as nearly as possible. The calibration gas shall be injected into the sample system as close to the sampling probe outlet as practical and should pass through all CEMS components used during normal sampling. Challenge the CEMS three non-consecutive times at each measurement point and record the responses. The duration of each gas injection should be sufficient to ensure that the CEMS surfaces are conditioned.

2.1.6.3.2 Calculations. Summarize the results on a data sheet. An example data sheet is shown in Figure 2.1-2. Average the differences between the instrument response and the certified cylinder gas value for each gas. Calculate three CE results (five CE results for a single-range CO CEMS) according to Equation 5 (section 2.1.7.5). No confidence coefficient is used in CE calculations.

2.1.6.4 Relative Accuracy Test Procedure.

2.1.6.4.1 Sampling Strategy for PTM tests. Conduct the PTM tests in such a way that they will yield measurements representative of the emissions from the source and can be correlated to the CEMS data. Although it is preferable to conduct the CO, diluent, and moisture (if needed) simultaneously, moisture measurements that are taken within a 60-minute period which includes the simultaneous CO and O₂ measurements may be used to calculate the dry CO concentration.

Note: At times, CEMS RA tests may be conducted during incinerator performance tests. In these cases, PTM results obtained during CEMS RA tests may be used to determine compliance with incinerator emissions limits as long as the source and test conditions are consistent with the applicable regulations.

SOURCE:		DATE:				
MONITOR:		LOCATION:				
SERIAL NUMBER:		SPAN:				
<table border="1" style="margin: auto;"> <tr> <td style="text-align: center;">LOW RANGE</td> </tr> <tr> <td style="text-align: center;">HIGH RANGE</td> </tr> </table>					LOW RANGE	HIGH RANGE
LOW RANGE						
HIGH RANGE						
RUN NUMBER	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE			
			Zero/Low	Mid	High	
1-Zero						
2-Mid						
3-High						
4-Mid						
5-Zero						
6-High						
7-Zero						
8-Mid						
9-High						
MEAN DIFFERENCE-CALIBRATION ERROR-			%	%	%	

Figure 2.1-2 Calibration Error Determination

2.1.6.4.2 Performance Test Methods.

2.1.6.4.2.1 Unless otherwise specified in the regulations, method 3 or 3A and method 10, 10A, or 10B (40 CFR part 60, appendix A) are the test methods for O₂ and CO, respectively. Make a sample traverse of at least 21 minutes, sampling for 7 minutes at each of three traverse points (see section 3.2).

2.1.6.4.2.2 When the installed CEMS uses a nondispersive infrared (NDIR) analyzer, method 10 shall use the alternative interference trap specified in section 10.1 of the method. An option, which may be approved by the Administrator in certain cases, would allow the test to be conducted using method 10 without the interference trap. Under this option, a laboratory interference test is performed for the analyzer prior to the field test. The laboratory interference test includes the analysis of SO₂, NO, and CO₂ calibration gases over the range of expected effluent concentrations. Acceptable performance is indicated if the CO analyzer response to each of the gases is less than 1 percent of the applicable measurement range of the analyzer.

2.1.6.4.3 Number of PTM Tests. Conduct a minimum of nine sets of all necessary PTM tests. If more than nine sets are conducted, a maximum of three sets may be rejected at the tester's discretion. The total number of sets used to determine the RA must be greater than or equal to nine. All data, including the rejected data, must be reported.

2.1.6.4.4 Correlation of PTM and CEMS Data. The time and duration of each PTM test run and the CEMS response time should be considered in correlating the data. Use the CEMS final output (the one used for reporting) to determine an integrated average CO concentration for each PTM test run. Confirm that the pair of results are on a consistent moisture and O₂ concentration basis. Each integrated CEMS value should then be compared against the corresponding average PTM value. If the CO concentration measured by the CEMS is normalized to a specified diluent concentration, the PTM results shall be normalized to the same value.

2.1.6.4.5 Calculations. Summarize the results on a data sheet. Calculate the mean of the PTM values and calculate the arithmetic differences between the PTM and the CEMS data sets. The mean of the differences, standard deviation, confidence coefficient, and CEMS RA should be calculated using Equations 1 through 4.

2.1.7 Equations

2.1.7.1 Arithmetic Mean (d). Calculate, d of the difference of a data set using Equation 1.

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i \quad (\text{Eq.1})$$

where: n = Number of data points.

$$\sum_{i=1}^n d_i = \text{Algebraic sum of the individual difference } d_i.$$

When the mean of the differences of pairs of data is calculated, correct the data for moisture, if applicable.

2.1.7.2 Standard Deviation (S_D). Calculate S_D using Equation 2.

$$S_D = \frac{\sqrt{\sum_{i=1}^n d_i^2 - \frac{(\sum_{i=1}^n d_i)^2}{n}}}{n-1}$$

2.1.7.3 Standard Deviation (S_D). Calculate S_D using Equation 2.

$$CC = t_{0.95} \frac{S_d}{\sqrt{n}} \quad (\text{Eq.3})$$

where:

$t_{0.95}$ = t-value (see Table 2.1-4).

Table 2.1-4-t-Values

n^*	$t_{0.95}$	n^*	$t_{0.95}$	n^*	$t_{0.95}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.282	15	2.145
6	2.571	11	2.228	16	2.131

FOOTNOTE: *The values in this table are already corrected for $n-1$ degrees of freedom. Use n equal to the number of individual values.

2.1.7.4 Relative Accuracy. Calculate the RA of a set of data using Equation 4.

$$RA = \frac{|\bar{d}| + |CC|}{PTM} \times 100$$

(Eq. 4)

where:

$|\bar{d}|$ = Absolute value of the mean of the differences (Equation 1).
 $|CC|$ = Absolute value of the confidence coefficient (Equation 3).
 PTM = Average reference value.

2.1.7.5 Calibration Error. Calculate CE using Equation 5.

$$CE = \left| \frac{\bar{d}}{FS} \right| \times 100$$

(Eq. 5)

\bar{d} = Mean difference between CEMS response and the known reference concentration.

2.1.8 Reporting

At a minimum, summarize in tabular form the results of the CD, RA, response time, and CE test, as appropriate. Include all data sheets, calculations, CEMS data records, and cylinder gas or reference material certifications.

2.1.9 Alternative Procedure

2.1.9.1 Alternative RA Procedure Rationale. Under some operating conditions, it may not be possible to obtain meaningful results using the RA test procedure. This includes conditions where consistent, very low CO emissions or low CO emissions interrupted periodically by short duration, high level spikes are observed. It may be appropriate in these circumstances to waive the PTM RA test and substitute the following procedure.

2.1.9.2 Alternative RA Procedure. Conduct a complete CEMS status check following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions (mirror movements, calibration gas valve operations, etc.), sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. All parts of the CEMS must be functioning properly before the RA requirement can be waived. The instruments must also have successfully passed the CE and CD requirements of the performance specifications. Substitution of the alternative procedure requires approval of the Department.

2.1.10 Quality Assurance (QA)

Proper calibration, maintenance, and operation of the CEMS is the responsibility of the owner or operator. The owner or operator must establish a QA program to evaluate and monitor CEMS performance. As a minimum, the QA program must include:

2.1.10.1 A daily calibration check for each monitor. The calibration must be adjusted if the check indicates the instrument's CD exceeds the specification established in section 2.1.4.5. The gases shall be injected as close to the probe as possible to provide a check of the entire sampling system. If an alternative calibration procedure is desired (e.g., direct injections or gas cells), subject to Department approval, the adequacy of this alternative procedure may be demonstrated during the initial 7-day CD test. Periodic comparisons of the two procedures are suggested.

2.1.10.2 A daily system audit. The audit must include a review of the calibration check data, an inspection of the recording system, an inspection of the control panel warning lights, and an inspection of the sample transport and interface system (e.g., flowmeters, filters), as appropriate.

2.1.10.3 A quarterly calibration error (CE) test. Quarterly RA tests may be substituted for the CE test when approved by the Department on a case-by-case basis.

2.1.10.4 An annual performance specification test.

2.1.11 References

1. Jahnke, James A. and G.J. Aldina, "Handbook: Continuous Air Pollution Source Monitoring Systems," U.S. Environmental Protection Agency Technology Transfer, Cincinnati, Ohio 45268, EPA-625/6-79-005, June 1979.

2. "Gaseous Continuous Emissions Monitoring Systems-Performance Specification Guidelines for SO₂, NO_x, CO₂, O₂, and TRS." U.S. Environmental Protection Agency OAQPS, ESED, Research Triangle Park, North Carolina 27711, EPA-450/3-82-026, October 1982.

3. "Quality Assurance Handbook for Air Pollution Measurement Systems: Volume I. Principles." U.S. Environmental Protection Agency ORD/EMSL, Research Triangle Park, North Carolina, 27711, EPA-600/9-76-006, December 1984.

4. Michie, Raymond, M. Jr., et. al., "Performance Test Results and Comparative Data for Designated Reference Methods for Carbon Monoxide," U.S. Environmental Protection Agency ORD/EMSL, Research Triangle Park, North Carolina, 27711, EPA-600/S4-83-013, September 1982.

5. Ferguson, B.B., R.E. Lester, and W.J. Mitchell, "Field Evaluation of Carbon Monoxide and Hydrogen Sulfide Continuous Emission Monitors at an Oil Refinery," U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711, EPA-600/4-82-054, August 1982.

2.2 Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste

2.2.1 Applicability and Principle

2.2.1.1 Applicability. These performance specifications apply to hydrocarbon (HC) continuous emission monitoring systems (CEMSs) installed on incinerators, boilers, and industrial furnaces burning hazardous waste. The specifications include procedures which are intended to be used to evaluate the acceptability of the CEMS at the time of its installation or whenever specified in regulations or permits. The procedures are not designed to evaluate CEMS performance over an extended period of time. The source owner or operator is responsible for the proper calibration, maintenance, and operation of the CEMS at all times.

2.2.1.2 Principle. A gas sample is extracted from the source through a heated sample line and heated filter (except as provided by section 2.2.10) to a flame ionization detector (FID). Results are reported as volume concentration equivalents of propane. Installation and measurement location specifications, performance and equipment specifications, test and data reduction procedures, and brief quality assurance guidelines are included in the specifications. Calibration drift, calibration error, and response time tests are conducted to determine conformance of the CEMS with the specifications.

2.2.2 Definitions

2.2.2.1 Continuous Emission Monitoring System (CEMS). The total equipment used to acquire data, which includes sample extraction and transport hardware, analyzer, data recording and processing hardware, and software. The system consists of the following major subsystems:

2.2.2.1.1 Sample Interface. That portion of the system that is used for one or more of the following: Sample acquisition, sample transportation, sample conditioning, or protection of the analyzer from the effects of the stack effluent.

2.2.2.1.2 Organic Analyzer. That portion of the system that senses organic concentration and generates an output proportional to the gas concentration.

2.2.2.1.3 Data Recorder. That portion of the system that records a permanent record of the measurement values. The data recorder may include automatic data reduction capabilities.

2.2.2.2 Instrument Measurement Range. The difference between the minimum and maximum concentration that can be measured by a specific instrument. The minimum is often stated or assumed to be zero and the range expressed only as the maximum.

2.2.2.3 Span or Span Value. Full scale instrument measurement range.

2.2.2.4 Calibration Gas. A known concentration of a gas in an appropriate diluent gas.

2.2.2.5 Calibration Drift (CD). The difference in the CEMS output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment takes place. A CD test is performed to demonstrate the stability of the CEMS calibration over time.

2.2.2.6 Response Time. The time interval between the start of a step change in the system input (e.g., change of calibration gas) and the time when the data recorder displays 95 percent of the final value.

2.2.2.7 Accuracy. A measurement of agreement between a measured value and an accepted or true value, expressed as the percentage difference between the true and measured values relative to the true value. For these performance specifications, accuracy is checked by conducting a calibration error (CE) test.

2.2.2.8 Calibration Error (CE). The difference between the concentration indicated by the CEMS and the known concentration of the cylinder gas. A CE test procedure is performed to document the accuracy and linearity of the monitoring equipment over the entire measurement range.

2.2.2.9 Performance Specification Test (PST) Period. The period during which CD, CE, and response time tests are conducted.

2.2.2.10 Centroidal Area. A concentric area that is geometrically similar to the stack or duct cross section and is no greater than 1 percent of the stack or duct cross-sectional area.

2.2.3 Installation and Measurement Location Specifications

2.2.3.1 CEMS Installation and Measurement Locations. The CEMS shall be installed in a location in which measurements representative of the source's emissions can be obtained. The optimum location of the sample interface for the CEMS is determined by a number of factors, including ease of access for calibration and maintenance, the degree to which sample conditioning will be required, the degree to which it represents total emissions, and the degree to which it represents the combustion situation in the firebox. The location should be as free from in-leakage influences as possible and reasonably free from severe flow disturbances. The sample location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs and at least 0.5 diameter upstream from the exhaust or control device. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, method 1, section 2.1. If these criteria are not achievable or if the location is otherwise less than optimum, the possibility of stratification should be investigated as described in section 2.2.3.2. The measurement point shall be within the centroidal area of the stack or duct cross section.

2.2.3.2 Stratification Test Procedure. Stratification is defined as a difference in excess of 10 percent between the average concentration in the duct or stack and the concentration at any point more than 1.0 meter from the duct or stack wall. To determine whether effluent stratification exists, a dual probe system should be used to determine the average effluent concentration while measurements at each traverse point are being made. One probe, located at the stack or duct centroid, is used as a stationary reference point to indicate the change in effluent concentration over time. The second probe is used for sampling at the traverse points specified in 40 CFR part 60 appendix A, method 1. The monitoring system samples sequentially at the reference and traverse points throughout the testing period for five minutes at each point.

2.2.4 CEMS Performance and Equipment Specifications

If this method is applied in highly explosive areas, caution and care shall be exercised in choice of equipment and installation.

2.2.4.1 Flame Ionization Detector (FID) Analyzer. A heated FID analyzer capable of meeting or exceeding the requirements of these specifications. Heated systems shall maintain the temperature of the sample gas between 150 °C (300 °F) and 175 °C (350 °F) throughout the system. This requires all system components such as the probe, calibration valve, filter, sample lines, pump, and the FID to be kept heated at all times such that no moisture is condensed out of the system.

Note: As specified in the regulations, unheated HC CEMs may be considered an acceptable interim alternative monitoring technique. For additional notes, see section 2.2.10. The essential components of the measurement system are described below:

2.2.4.1.1 Sample Probe. Stainless steel, or equivalent, to collect a gas sample from the centroidal area of the stack cross-section.

2.2.4.1.2 Sample Line. Stainless steel or Teflon tubing to transport the sample to the analyzer.

Note: Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency or South Carolina Department of Health and Environmental Control.

2.2.4.1.3 Calibration Valve Assembly. A heated three-way valve assembly to direct the zero and calibration gases to the analyzer is recommended. Other methods, such as quick-connect lines, to route calibration gas to the analyzers are applicable.

2.2.4.1.4 Particulate Filter. An in-stack or out-of-stack sintered stainless steel filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated.

2.2.4.1.5 Fuel. The fuel specified by the manufacturer (e.g., 40 percent hydrogen/60 percent helium, 40 percent hydrogen/60 percent nitrogen gas mixtures, or pure hydrogen) should be used.

2.2.4.1.6 Zero Gas. High purity air with less than 0.1 parts per million by volume (ppm) HC as methane or carbon equivalent or less than 0.1 percent of the span value, whichever is greater.

2.2.4.1.7 Calibration Gases. Appropriate concentrations of propane gas (in air or nitrogen). Preparation of the calibration gases should be done according to the procedures in EPA Protocol 1. In addition, the manufacturer of the cylinder gas should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change by more than ± 2 percent from the certified value.

2.2.4.2 CEMS Span Value. 100 ppm propane.

2.2.4.3 Daily Calibration Gas Values. The owner or operator must choose calibration gas concentrations that include zero and high-level calibration values.

2.2.4.3.1 The zero level may be between 0 and 20 ppm (zero and 20 percent of the span value).

2.2.4.3.2 The high-level concentration shall be between 50 and 90 ppm (50 and 90 percent of the span value).

2.2.4.4 Data Recorder Scale. The strip chart recorder, computer, or digital recorder must be capable of recording all readings within the CEMS's measurement range and shall have a resolution of 0.5 ppm (0.5 percent of span value).

2.2.4.5 Response Time. The response time for the CEMS must not exceed 2 minutes to achieve 95 percent of the final stable value.

2.2.4.6 Calibration Drift. The CEMS must allow the determination of CD at the zero and high-level values. The CEMS calibration response must not differ by more than ± 3 ppm (± 3 percent of the span value) after each 24-hour period of the 7-day test at both zero and high levels.

2.2.4.7 Calibration Error. The mean difference between the CEMS and reference values at all three test points listed below shall be no greater than 5 ppm (± 5 percent of the span value).

2.2.4.7.1 Zero Level. Zero to 20 ppm (0 to 20 percent of span value).

2.2.4.7.2 Mid-Level. 30 to 40 ppm (30 to 40 percent of span value).

2.2.4.7.3 High-Level. 70 to 80 ppm (70 to 80 percent of span value).

2.2.4.8 Measurement and Recording Frequency. The sample to be analyzed shall pass through the measurement section of the analyzer without interruption. The detector shall measure the sample concentration at least once every 15 seconds. An average emission rate shall be computed and recorded at least once every 60 seconds.

2.2.4.9 Hourly Rolling Average Calculation. The CEMS shall calculate every minute an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

2.2.4.10 Retest. If the CEMS produces results within the specified criteria, the test is successful. If the CEMS does not meet one or more of the criteria, necessary corrections must be made and the performance tests repeated.

2.2.5 Performance Specification Test (PST) Periods

2.2.5.1 Pretest Preparation Period. Install the CEMS, prepare the PTM test site according to the specifications in section 2.2.3, and prepare the CEMS for operation and calibration according to the manufacturer's written instructions. A pretest conditioning period similar to that of the 7-day CD test is recommended to verify the operational status of the CEMS.

2.2.5.2 Calibration Drift Test Period. While the facility is operating under normal conditions, determine the magnitude of the CD at 24-hour intervals for seven consecutive days according to the procedure given in section 2.2.6.1. All CD determinations must be made following a 24-hour period during which no unscheduled maintenance, repair, or adjustment takes place. If the combustion unit is taken out of service during the test period, record the onset and duration of the downtime and continue the CD test when the unit resumes operation.

2.2.5.3 Calibration Error Test and Response Time Test Periods. Conduct the CE and response time tests during the CD test period.

2.2.6 Performance Specification Test Procedures

2.2.6.1 Calibration Drift Test.

2.2.6.1.1 Sampling Strategy. Conduct the CD test at 24-hour intervals for seven consecutive days using calibration gases at the two daily concentration levels specified in section 2.2.4.3. Introduce the two calibration gases into the sampling system as close to the sampling probe outlet as practical. The gas shall pass through all CEM components used during normal sampling. If periodic automatic or manual adjustments are made to the CEMS zero and calibration settings, conduct the CD test immediately before these adjustments, or conduct it in such a way that the CD can be determined. Record the CEMS response and subtract this value from the reference (calibration gas) value. To meet the specification, none of the differences shall exceed 3 ppm.

2.2.6.1.2 Calculations. Summarize the results on a data sheet. An example is shown in Figure 2.2-1. Calculate the differences between the CEMS responses and the reference values.

2.2.6.2 Response Time. The entire system including sample extraction and transport, sample conditioning, gas analyses, and the data recording is checked with this procedure.

2.2.6.2.1 Introduce the calibration gases at the probe as near to the sample location as possible. Introduce the zero gas into the system. When the system output has stabilized (no change greater than 1 percent of full scale for 30 sec), switch to monitor stack effluent and wait for a stable value. Record the time (upscale response time) required to reach 95 percent of the final stable value.

2.2.6.2.2 Next, introduce a high-level calibration gas and repeat the above procedure. Repeat the entire procedure three times and determine the mean upscale and downscale response times. The longer of the two means is the system response time.

2.2.6.3 Calibration Error Test Procedure.

2.2.6.3.1 Sampling Strategy. Challenge the CEMS with zero gas and EPA Protocol 1 cylinder gases at measurement points within the ranges specified in section 2.2.4.7.

2.2.6.3.1.1 The daily calibration gases, if Protocol 1, may be used for this test.

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER:	SPAN:

	DAY	DATE	TIME	CALIBRATION VALUE	MONITOR RESPONSE	DIFFER- ENCE	PERCENT OF SPAN*
ZERO/ LOW LEVEL							
HIGH LEVEL							

* Acceptance Criteria: ≤ 3% Of span each day for seven days.

Figure 2.1-1 Calibration Drift Determination

2.2.6.3.1.2 Operate the CEMS as nearly as possible in its normal sampling mode. The calibration gas should be injected into the sampling system as close to the sampling probe outlet as practical and shall pass through all filters, scrubbers, conditioners, and other monitor components used during normal sampling. Challenge the CEMS three non-consecutive times at each measurement point and record the responses. The duration of each gas injection should be for a sufficient period of time to ensure that the CEMS surfaces are conditioned.

2.2.6.3.2 Calculations. Summarize the results on a data sheet. An example data sheet is shown in Figure 2.2-2. Average the difference between the instrument response and the certified cylinder gas value for each gas. Calculate three CE results according to Equation 1. No confidence coefficient is used in CE calculations.

2.2.7 Equations

2.2.7.1 Calibration Error. Calculate CE using Equation 1.

$$CE = \left| \frac{\bar{d}}{FS} \right| \times 100 \quad (Eq. 1)$$

where:

\bar{d} = Mean difference between CEMS response and the known reference concentration.

2.2.8 Reporting

At a minimum, summarize in tabular form the results of the CD, response time, and CE test, as appropriate. Include all data sheets, calculations, CEMS data records, and cylinder gas or referenced material certifications.

SOURCE:		DATE:		
MONITOR:		LOCATION:		
SERIAL NUMBER:		SPAN:		

RUN NUMBER	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE		
			Zero/Low	Mid	High
1-Zero					
2-Mid					
3-High					
4-Mid					
5-Zero					
6-High					
7-Zero					
8-Mid					
9-High					
MEAN DIFFERENCE- CALIBRATION ERROR-			%	%	%

2.2.9 Quality Assurance (QA)

Proper calibration, maintenance, and operation of the CEMS is the responsibility of the owner or operator. The owner or operator must establish a QA program to evaluate and monitor CEMS performance. As a minimum, the QA program must include:

2.2.9.1 A daily calibration check for each monitor. The calibration must be adjusted if the check indicates the instrument's CD exceeds 3 ppm. The gases shall be injected as close to the probe as possible to provide a check of the entire sampling system. If an alternative calibration procedure is desired (e.g., direct injections or gas cells), subject to Administrator approval, the adequacy of this alternative procedure may be demonstrated during the initial 7-day CD test. Periodic comparisons of the two procedures are suggested.

2.2.9.2 A daily system audit. The audit must include a review of the calibration check data, an inspection of the recording system, an inspection of the control panel warning lights, and an inspection of the sample transport and interface system (e.g., flowmeters, filters), as appropriate.

2.2.9.3 A quarterly CE test. Quarterly RA tests may be substituted for the CE test when approved by the Department on a case-by-case basis.

2.2.9.4 An annual performance specification test.

2.2.10 Alternative Measurement Technique

The regulations allow gas conditioning systems to be used in conjunction with unheated HC CEMs during an interim period. This gas conditioning may include cooling to not less than 40 °F and the use of condensate traps to reduce the moisture content of sample gas entering the FID to less than 2 percent. The gas conditioning system, however, must not allow the sample gas to bubble through the condensate as this would remove water soluble organic compounds. All components upstream of the conditioning system should be heated as described in section 2.2.4 to minimize operating and maintenance problems.

2.2.11 References

1. Measurement of Volatile Organic Compounds-Guideline Series. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711, EPA-450/2-78-041, June 1978.

2. Traceability Protocol for Establishing True Concentrations of Gases Used for Calibration and Audits of Continuous Source Emission Monitors (Protocol No. 1). U.S. Environmental Protection Agency ORD/EMSL, Research Triangle Park, North Carolina, 27711, June 1978.

3. Gasoline Vapor Emission Laboratory Evaluation-Part 2. U.S. Environmental Protection Agency, OAQPS, Research Triangle Park, North Carolina, 27711, EMB Report No. 76-GAS-6, August 1975.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Editor's Note

Republished in 2016 to fix a typographical error.

Section 3.0. SAMPLING AND ANALYTICAL METHODS

3.1 Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes

3.1.1 Applicability and Principle

3.1.1.1 Applicability. This method is being developed for the determination of total chromium (Cr), cadmium (Cd), arsenic (As), nickel (Ni), manganese (Mn), beryllium (Be), copper (Cu), zinc (Zn), lead (Pb), selenium (Se), phosphorus (P), thallium (Tl), silver (Ag), antimony (Sb), barium (Ba), and mercury (Hg) stack emissions from hazardous waste incinerators and similar combustion processes. This method may also be used for the determination of particulate emissions following the procedures and precautions described. Modifications to the sample recovery and analysis procedures described in this protocol for the purpose of determining particulate emissions may potentially impact the front-half mercury determination. Mercury emissions should be determined using EPA method 101A given in 40 CFR part 61.

3.1.1.2 Principle. The stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing an aqueous solution of dilute nitric acid combined with dilute hydrogen peroxide in each of two impingers, and acidic potassium permanganate solution in each of two impingers. Sampling train components are recovered and digested in separate front-and back-half fractions. Materials collected in the sampling train are digested with acid solutions to dissolve organics and to remove organic constituents that may create analytical interferences. Acid

digestion is performed using conventional Parr● Bomb or microwave digestion techniques. The nitric acid and hydrogen peroxide impinger solution, the acidic potassium permanganate impinger solution, the HCl rinse solution, and the probe rinse and digested filter solutions are analyzed for mercury by cold vapor atomic absorption spectroscopy (CVAAS). The nitric acid and hydrogen peroxide solution and the probe rinse and digested filter solutions of the train catches are analyzed for Cr, Cd, Ni, Mn, Be, Cu, Zn, Pb, Se, P, Tl, Ag, Sb, Ba, and As by inductively coupled argon plasma emission spectroscopy (ICAP) or atomic absorption spectroscopy (AAS). Graphite furnace atomic absorption spectroscopy (GFAAS) is used for analysis of antimony, arsenic, cadmium, lead, selenium, and thallium, if these elements require greater analytical sensitivity than can be obtained by ICAP. Additionally, if desired, the tester may use AAS for analyses of all metals if the resulting in-stack method detection limits meet the goal of the testing program. For convenience, aliquots of each digested sample Fraction 1A plus Fraction 2A can be combined proportionally with respect to the original Fraction 1 (normally diluted to 300 ml following digestion and prior to analysis) section 3.1.5.3.3; and concentrated Fraction 2A (normally diluted to 150 ml following digestion and prior to analysis) section 3.1.5.3.4.1 or 3.1.5.3.4.2 for a single analytical determination. The efficiency of the analytical procedure is quantified by the analysis of spiked quality control samples containing each of the target metals and/or other quality assurance measures, as necessary, including actual sample matrix effects checks.

3.1.2 Range, Sensitivity, Precision, and Interferences

3.1.2.1 Range. For the analyses described in this methodology and for similar analyses, the ICAP response is linear over several orders of magnitude. Samples containing metal concentrations in the nanograms per milliliter (*ug/ml*) to micrograms per milliliter (*ug/ml*) range in the analytical finish solution can be analyzed using this technique. Samples containing greater than approximately 50 *ug/ml* of chromium, lead, or arsenic should be diluted to that level or lower for final analysis. Samples containing greater than approximately 20 *ug/ml* of cadmium should be diluted to that level before analysis.

3.1.2.2 Analytical Sensitivity. ICAP analytical detection limits for the sample solutions (based on SW-846, method 6010) are approximately as follows: Sb (32 ng/ml), As (53 ng/ml), Ba (2 ng/ml), Be (0.3 ng/ml), Cd (4 ng/ml), Cr (7 ng/ml), Cu (6 ng/ml), Pb (42 ng/ml), Mn (2 ng/ml), Ni (15 ng/ml), P (75 ng/ml), Se (75 ng/ml), Ag (7 ng/ml), Tl (40 ng/ml), and Zn (2 ng/ml). The actual method detection limits are sample dependent and may vary as the sample matrix may affect the limits. The analytical detection limits for analysis by direct aspiration AAS (based on SW-846, Method 7000 series) are approximately as follows: Sb (200 ng/ml), As (2 ng/ml), Ba (100 ng/ml), Be (5 ng/ml), Cd (5 ng/ml), Cr (50 ng/ml), Cu (20 ng/ml), Pb (100 ng/ml), Mn (10 ng/ml), Ni (40 ng/ml), Se (2 ng/ml), Ag (10 ng/ml), Tl (100 ng/ml), and Zn (5 ng/ml). The detection limit for mercury by CVAAS is approximately 0.2 ng/ml). The use of GFAAS can give added sensitivity compared to the use of direct aspiration AAS for the following metals: Sb (3 ng/ml), As (1 ng/ml), Be (0.2 ng/ml), Cd (0.1 ng/ml), Cr (1 ng/ml), Pb (1 ng/ml), Se (2 ng/ml), and Tl (1 ng/ml).

Using (1) the procedures described in this method, (2) the analytical detection limits described in the previous paragraph, (3) a volume of 300 ml, Fraction 1, for the front half and 150 ml, Fraction 2A, for the back-half samples, and (4) a stack gas sample volume of 1.25 m³, the corresponding instack method detection limits are presented in Table A-1 and calculated as shown:

$$\frac{A \times B}{C} = D$$

where:

A=analytical detection limit, *ug/ml*.

B=volume of sample prior to aliquot for analysis, ml.

C=stack sample volume, dscm (dsm³).

D=in-stack detection limit, *ug/m³*.

Values in Table 3.1-1 are calculated for the front and back half and/or the total train.

To ensure optimum sensitivity in obtaining the measurements, the concentrations of target metals in the solutions are suggested to be at least ten times the analytical detection limits. Under certain conditions, and with greater care in the analytical procedure, this concentration can be as low as approximately three times the analytical detection limit. In all cases, on at least one sample (run) in the source test and for each metal analyzed, repetitive analyses, method of standard additions (MSA), serial dilution, or matrix spike addition, etc., shall be used to establish the quality of the data.

Actual in-stack method detection limits will be determined based on actual source sampling parameters and analytical results as described above. If required, the method in-stack detection limits can be made more sensitive than those shown in Table A-I for a specific test by using one or more of the following options:

- A 1-hour sampling run may collect a stack gas sampling volume of about 1.25 m³. If the sampling time is increased and 5 m³ are collected, the in-stack method detection limits would be one fourth of the values shown in Table A-I (this means that with this change, the method is four times more sensitive than a 1-hour run. Larger sample volumes (longer runs) would make it even more sensitive).

- The in-stack detection limits assume that all of the sample is digested (with exception of the aliquot for mercury) and the final liquid volumes for analysis are 300 ml, Fraction 1 for the front half and 150 ml, Fraction 2A, for the back-half sample. If the front-half volume is reduced from 300 ml to 30 ml, the front-half in-stack detection limits would be one tenth of the values shown above (ten times more sensitive). If the back-half volume is reduced from 150 ml to 25 ml, the in-stack detection limits would be one sixth of the above values. Matrix effects checks are necessary on analyses of samples and typically are of greater significance for samples that have been concentrated to less than the normal original sample volume. Reduction to a volume of less than 25 ml may not allow redissolving of the residue and may increase interference by other compounds.

- When both of the above two improvements are used on one sample at the same time, the resultant improvements are multiplicative. For example, where stack gas volume is increased by a factor of five and the total liquid sample digested volume of both the front and back halves is reduced by a factor of six, the in-stack method detection limit is reduced by a factor of thirty (the method is thirty times more sensitive).

Table 3. 1-1-In-Stack Method Detection Limits (µg/m³) for Train Fractions Using ICAP and AAS

Metal	Front-half fraction 1 probe and filter	Back-half fraction 2 impingers 1-3	Back-half fractions "Hg. only" impingers 4-6	Total train
Antimony	7.7(0.7)'	3.8(0.4)'		11.5(1.1)'
Arsenic	12.7(0.3)'	6.4(0.1)'		19.1(0.4)'
Barium	0.5	0.3		0.8
Beryllium	0.07(0.05)'	0.04(0.03)'		0.11 (0.08)'
Cadmium	1.0(0.02)'	0.5(0.01)'		1.5(0.03)'
Chromium	1.7(0.2)'	0.8(0.1)'		2.5(0.3)'
Copper	1.4	0.7		2.1
Lead	10.1(0.2)'	5.0(0.1)'		15.1(0.3)'
Manganese	0.5(0.2)'	0.2(0.1)'		0.7(0.3)'
Mercury	0.6"	3.0"	2.0"	5.6"
Nickel	3.6	1.8		5.4
Phosphorus	18	9		27
Selenium	18	9		27
	(0.5)'	(0.3)'		(0.8)'
Silver	1.7	0.9		2.6
Thallium	9.6(0.2)'	4.8(0.1)'		14.4(0.3)'

Metal	Front-half fraction 1 probe and filter	Back-half fraction 2 impingers 1-3	Back-half fractions "Hg. only" impingers 4-6	Total train
Zinc	0.5	0.3		0.8

FOOTNOTE: ()' Detection limit when analyzed by GFAAS.

FOOTNOTE: " Deletion limit when analyzed by CVAAS, estimated for Back Half and Total Train.

Note: Actual method in-stack detection limits will be determined based on actual source sampling parameters and analytical results as described earlier in this section.

●Conversely, reducing stack gas sample volume and increasing sample liquid volume will increase in-stack detection limits (the method would then be less sensitive). The front-half and back-half samples (Fractions 1A plus and 2A) can be combined proportionally (see section 3.1.1.2 of this methodology) prior to analysis. The resultant liquid volume (excluding the mercury fractions, which must be analyzed separately) is recorded. Combining the sample as described does not allow determination (whether front or back half) of where in the train the sample was captured. The in-stack method detection limit then becomes a single value for all metals except mercury, for which the contribution of the mercury fractions must be considered.

The above discussion assumes no blank correction. Blank corrections are discussed later in this method.

3.1.2.3 Precision. The precisions (relative standard deviation) for each metal detected in a method development test at a sewage sludge incinerator, are as follows: Sb (12.7%), As (13.5%), Ba (20.6%), Cd (11.5%), Cr (11.2%), Cu (11.5%), Pb (11.6%), P (14.6%), Se (15.3%), Tl (12.3%), and Zn (11.8%). The precision for nickel was 7.7% for another test conducted at a source simulator. Beryllium, manganese, and silver were not detected in the tests; however, based on the analytical sensitivity of the ICAP for these metals, it is assumed that their precisions should be similar to those for the other metals, when detected at similar levels.

3.1.2.4 Interferences. Iron can be a spectral interference during the analysis of arsenic, chromium, and cadmium by ICAP. Aluminum can be a spectral interference during the analysis of arsenic and lead by ICAP. Generally, these interferences can be reduced by diluting the sample, but this increases the method detection limit (in-stack detection limit). Refer to EPA method 6010 (SW-846) or the other analytical methods used for details on potential interferences for this method. The analyst must eliminate or reduce interferences to acceptable levels. For all GFAAS analyses, matrix modifiers should be used to limit interferences, and standards should be matrix matched.

3.1.3 Apparatus

3.1.3.1 Sampling Train. A schematic of the sampling train is shown in Figure 3.1-1. It is similar to the 40 CFR part 60, appendix A method 5 train. The sampling train consists of the following components:

3.1.3.1.1 Probe Nozzle (Probe Tip) and Borosilicate or Quartz Glass Probe Liner. Same as method 5, sections 2.1.1 and 2.1.2, except that glass nozzles are required unless an alternate probe tip prevents the possibility of contamination or interference of the sample with its materials of construction. If a probe tip other than glass is used, no correction (because of any effect on the sample by the probe tip) of the stack sample test results can be made.

3.1.3.1.2 Pitot Tube and Differential Pressure Gauge. Same as method 2, sections 2.1 and 2.2, respectively.

3.1.3.1.3 Filter Holder. Glass, same as method 5, section 2.1.5, except that a Teflon filter support or other non-metallic, non-contaminating support must be used to replace the glass frit.

3.1.3.1.4 Filter Heating System. Same as method 5, section 2.1.6.

3.1.3.1.5 Condenser. The following system shall be used for the condensation and collection of gaseous metals and for determining the moisture content of the stack gas. The condensing system should consist of four to seven impingers connected in series with leak-free ground glass fittings or other leak-free, non-contaminating fittings. The first impinger is optional and is recommended as a moisture knockout trap for use during test conditions which require such a trap. The first impinger shall be appropriately-sized, if necessary, for an expected large moisture catch and generally constructed as described for the first impinger in method 5, paragraph 2.1.7. The second impinger (or the first HNO₃/H₂O₂ impinger) shall also be constructed as

described for the first impinger in method 5. The third impinger (or the second $\text{HNO}_3/\text{H}_2\text{O}_2$ impinger) shall be the same as the Greenburg Smith impinger with the standard tip described as the second impinger in method 5, paragraph 2.1.7. All other impingers used in the methods train are the same as the first $\text{HNO}_3/\text{H}_2\text{O}_2$ impinger described in this paragraph. In summary, the first impinger which may be optional as described in this methodology shall be empty, the second and third shall contain known quantities of a nitric acid/hydrogen peroxide solution (section 3.1.4.2.1), the fourth shall be empty, the fifth and sixth shall contain a known quantity of acidic potassium permanganate solution (section 3.1.4.2.2), and the last impinger shall contain a known quantity of silica gel. A thermometer capable of measuring to within 1°C (2°F) shall be placed at the outlet of the last impinger. When the moisture knockout impinger is not needed, it is removed from the train and the other impingers remain the same. If mercury analysis is not to be performed, the potassium permanganate impingers and the empty impinger preceding them are removed.

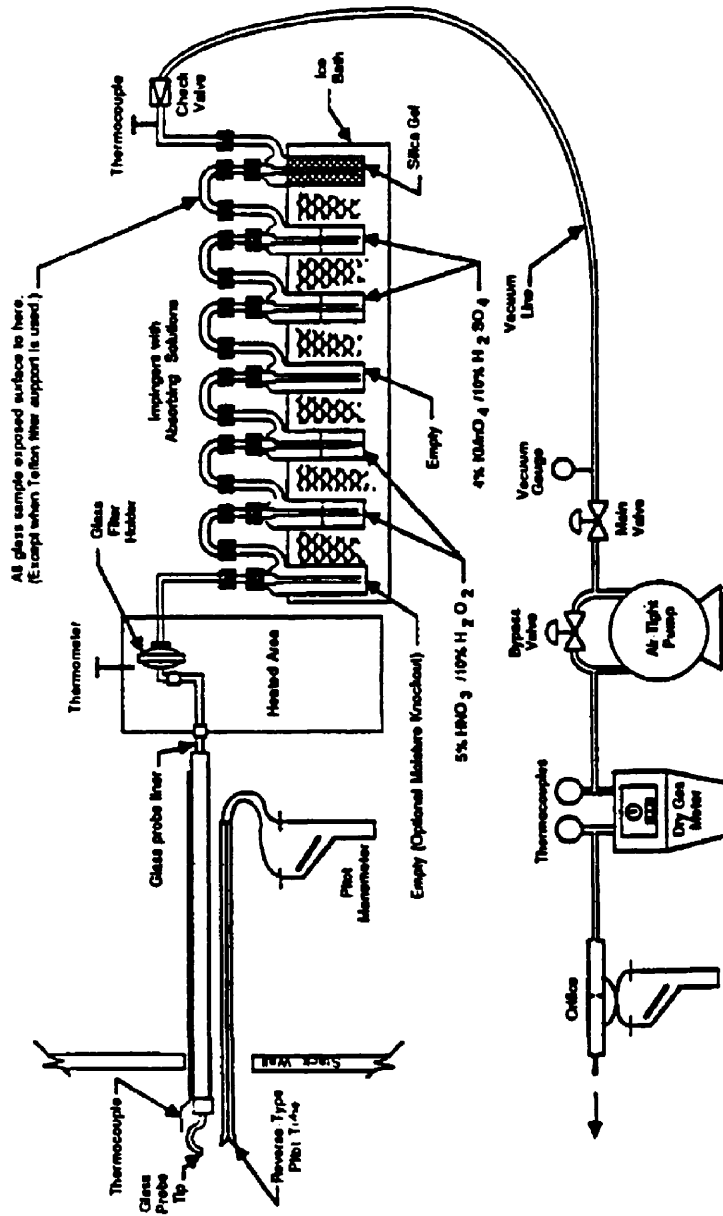


Figure 3.1-1 Schematic of multiple metals sampling train configuration.

[Appendix IX]

3.1.3.1.6 Metering System, Barometer, and Gas Density Determination Equipment. Same as method 5, sections 2.1.8 through 2.1.10, respectively.

3.1.3.1.7 Teflon Tape. For capping openings and sealing connections, if necessary, on the sampling train.

3.1.3.2 Sample Recovery. Same as method 5, sections 2.2.1 through 2.2.8 (Nonmetallic Probe-Liner and Probe-Nozzle Brushes or Swabs, Wash Bottles, Sample Storage Containers, Petri Dishes, Glass Graduated Cylinder, Plastic Storage Containers, Funnel and Rubber Policeman, and Glass Funnel), respectively, with the following exceptions and additions:

3.1.3.2.1 Nonmetallic Probe-Liner and Probe-Nozzle Brushes or Swabs. For quantitative recovery of materials collected in the front half of the sampling train: Description of acceptable all-Teflon component brushes or swabs is to be included in EPA's Emission Measurement Technical Information Center (EMTIC) files.

3.1.3.2.2 Sample Storage Containers. Glass bottles with Teflon-lined caps which are non-reactive to the oxidizing solutions, with a capacity of 1000- and 500-ml, shall be used for KMnO_4 -containing samples and blanks. Polyethylene bottles may be used for other sample types.

3.1.3.2.3 Graduated Cylinder. Glass or equivalent.

3.1.3.2.4 Funnel. Glass or equivalent.

3.1.3.2.5 Labels. For identification of samples.

3.1.3.2.6 Polypropylene Tweezers and/or Plastic Gloves. For recovery of the filter from the sampling train filter holder.

3.1.3.3 Sample Preparation and Analysis. For the analysis, the following equipment is needed:

3.1.3.3.1 Volumetric Flasks, 100-ml, 250-ml, and 1000-ml. For preparation of standards and sample dilution.

3.1.3.3.2 Graduated Cylinders. For preparation of reagents.

3.1.3.3.3 Parr[®] Bombs or Microwave Pressure Relief Vessels with Capping Station (GEM Corporation model or equivalent).

3.1.3.3.4 Beakers and Watchglasses. 250-ml beakers for sample digestion with watchglasses to cover the tops.

3.1.3.3.5 Ring Stands and Clamps. For securing equipment such as filtration apparatus.

3.1.3.3.6 Filter Funnels. For holding filter paper.

3.1.3.3.7 Whatman 541 Filter Paper (or equivalent). For filtration of digested samples.

3.1.3.3.8 Disposable Pasteur Pipets and Bulbs.

3.1.3.3.9 Volumetric Pipets.

3.1.3.3.10 Analytical Balance. Accurate to within 0.1 mg.

3.1.3.3.11 Microwave or Conventional Oven. For heating samples at fixed power levels or temperatures.

3.1.3.3.12 Hot Plates.

3.1.3.3.13 Atomic Absorption Spectrometer (AAS). Equipped with a background corrector.

3.1.3.3.13.1 Graphite Furnace Attachment. With antimony, arsenic, cadmium, lead, selenium, thallium hollow cathode lamps (HCLs) or electrodeless discharge lamps (EDLs). (Same as EPA SW-846 methods 7041 (antimony), 7060 (arsenic), 7131 (cadmium), 7421 (lead), 7740 (selenium), and 7841 (thallium).)

3.1.3.3.13.2 Cold Vapor Mercury Attachment. With a mercury HCL or EDL. The equipment needed for the cold vapor mercury attachment includes an air recirculation pump, a quartz cell, an aerator apparatus, and a heat lamp or desiccator tube. The heat lamp should be capable of raising the ambient temperature at the quartz cell by 10°C such that no condensation forms on the wall of the quartz cell. (Same as EPA method 7470.)

3.1.3.3.14 Inductively Coupled Argon Plasma Spectrometer. With either a direct or sequential reader and an alumina torch. (Same as EPA method 6010.)

3.1.4 Reagents

The complexity of this methodology is such that to obtain reliable results, the testers (Including analysts) should be experienced and knowledgeable in source sampling, in handling and preparing (including mixing) reagents as described, and using adequate safety procedures and protective equipment in performing this method, including sampling, mixing reagents, digestions, and

analyses. Unless otherwise indicated, it is intended that all reagents conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available; otherwise, use the best available grade.

3.1.4.1 Sampling. The reagents used in sampling are as follows:

3.1.4.1.1 Filters. The filters shall contain less than 1.3 ug/in^2 of each of the metals to be measured. Analytical results provided by filter manufacturers are acceptable. However, if no such results are available, filter blanks must be analyzed for each target metal prior to emission testing. Quartz fiber or glass fiber (which meet the requirement of containing less than 1.3 ug/in^2 of each metal) filters without organic binders shall be used. The filters should exhibit at least 99.95 percent efficiency (<0.05 percent penetration) on 0.3 micron dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM Standard Method D2986-71 (incorporated by reference). For particulate determination in sources containing SO_2 or SO_3 , the filter material must be of a type that is unreactive to SO_2 or SO_3 , as described in EPA method 5. Quartz fiber filters meeting these requirements are recommended for use in this method.

3.1.4.1.2 Water. To conform to ASTM Specification D1193.77, Type II (incorporated by reference). If necessary, analyze the water for all target metals prior to field use. All target metal concentrations should be less than 1 ng/ml.

3.1.4.1.3 Nitric Acid. Concentrated. Baker Instra-analyzed or equivalent.

3.1.4.1.4 Hydrochloric Acid. Concentrated. Baker Instra-analyzed or equivalent.

3.1.4.1.5 Hydrogen Peroxide, 30 Percent (V/V).

3.1.4.1.6 Potassium Permanganate.

3.1.4.1.7 Sulfuric Acid. Concentrated.

3.1.4.1.8 Silica Gel and Crushed Ice. Same as method 5, sections 3.1.2 and 3.1.4, respectively.

3.1.4.2 Pretest Preparation for Sampling Reagents.

3.1.4.2.1 Nitric Acid (HNO_3)/Hydrogen Peroxide (H_2O_2) Absorbing Solution, 5 Percent HNO_3 /10 Percent H_2O_2 . Carefully with stirring, add 50 ml of concentrated HNO_3 to a 1000-ml volumetric flask containing approximately 500 ml of water, and then, carefully with stirring, add 333 ml of 30 percent H_2O_2 . Dilute to volume (1000 ml) with water. Mix well. The reagent shall contain less than 2 ng/ml of each target metal.

3.1.4.2.2 Acidic Potassium Permanganate (KMnO_4) Absorbing Solution, 4 Percent KMnO_4 (W/V), 10 Percent H_2SO_4 (V/V). Prepare fresh daily. Mix carefully, with stirring, 100 ml of concentrated H_2SO_4 into 800 ml of water, and add water with stirring to make a volume of 1 L. This solution is 10 percent H_2SO_4 (V/V). Dissolve, with stirring, 40 g of KMnO_4 into 10 percent H_2SO_4 (V/V) and add 10 percent H_2SO_4 (V/V) with stirring to make a volume of 1 L: this is the acidic potassium permanganate absorbing solution. Prepare and store in glass bottles to prevent degradation. The reagent shall contain less than 2 ng/ml of Hg.

Precaution: To prevent autocatalytic decomposition of the permanganate solution, filter the solution through Whatman 541 filter paper. Also, due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottle; these bottles shall not be fully filled and shall be vented both to relieve potential excess pressure and prevent explosion due to pressure buildup. Venting is required, but should not allow contamination of the sample; a No. 70-72 hole drilled in the container cap and Teflon liner has been used.

3.1.4.2.3 Nitric Acid, 0.1 N. With stirring, add 6.3 ml of concentrated HNO_3 (70 percent) to a flask containing approximately 900 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 ng/ml of each target metal.

3.1.4.2.4 Hydrochloric Acid (HCl), 8 N. Make the desired volume of 8 N HCl in the following proportions. Carefully with stirring, add 690 ml of concentrated HCl to a flask containing 250 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 ng/ml of Hg.

3.1.4.3 Glassware Cleaning Reagents.

3.1.4.3.1 Nitric Acid, Concentrated. Fisher ACS grade or equivalent.

3.1.4.3.2 Water. To conform to ASTM Specifications D1193-77, Type II.

3.1.4.3.3 Nitric Acid, 10 Percent (V/V). With stirring, add 500 ml of concentrated HNO₃ to a flask containing approximately 4000 ml of water. Dilute to 5000 ml with water. Mix well. Reagent shall contain less than 2 ng/ml of each target metal.

3.1.4.4 Sample Digestion and Analysis Reagents.

3.1.4.4.1 Hydrochloric Acid, Concentrated.

3.1.4.4.2 Hydrofluoric Acid, Concentrated.

3.1.4.4.3 Nitric Acid, Concentrated. Baker Instra-analyzed or equivalent.

3.1.4.4.4 Nitric Acid, 50 Percent (V/V). With stirring, add 125 ml of concentrated HNO₃ to 100 ml of water. Dilute to 250 ml with water. Mix well. Reagent shall contain less than 2 ng/ml of each target metal.

3.1.4.4.5 Nitric Acid, 5 Percent (V/V). With stirring, add 50 ml of concentrated HNO₃ to 800 ml of water. Dilute to 1000 ml with water. Mix well. Reagent shall contain less than 2 ng/ml of each target metal.

3.1.4.4.6 Water. To conform to ASTM Specifications D1193-77, Type II.

3.1.4.4.7 Hydroxylamine Hydrochloride and Sodium Chloride Solution. See EPA method 7470 for preparation.

3.1.4.4.8 Stannous Chloride. See method 7470.

3.1.4.4.9 Potassium Permanganate, 5 Percent (W/V). See method 7470.

3.1.4.4.10 Sulfuric Acid, Concentrated.

3.1.4.4.11 Nitric Acid, 50 Percent (V/V).

3.1.4.4.12 Potassium Persulfate, 5 Percent (W/V). See Method 7470.

3.1.4.4.13 Nickel Nitrate, Ni(NO₃)₂ · 6H₂O.

3.1.4.4.14 Lanthanum, Oxide, La₂O₃.

3.1.4.4.15 AAS Grade Hg Standard, 1000 ug/ml.

3.1.4.4.16 AAS Grade Pb Standard, 1000 ug/ml.

3.1.4.4.17 AAS Grade As Standard, 1000 ug/ml.

3.1.4.4.18 AAS Grade Cd Standard, 1000 ug/ml.

3.1.4.4.19 AAS Grade Cr Standard, 1000 ug/ml.

3.1.4.4.20 AAS Grade Sb Standard, 1000 ug/ml.

3.1.4.4.21 AAS Grade Ba Standard, 1000 ug/ml.

3.1.4.4.22 AAS Grade Be Standard, 1000 ug/ml.

3.1.4.4.23 AAS Grade Cu Standard, 1000 ug/ml.

3.1.4.4.24 AAS Grade Mn Standard, 1000 ug/ml.

3.1.4.4.25 AAS Grade Ni Standard, 1000 ug/ml.

3.1.4.4.26 AAS Grade P Standard, 1000 ug/ml.

3.1.4.4.27 AAS Grade Se Standard, 1000 ug/ml.

3.1.4.4.28 AAS Grade Ag Standard, 1000 ug/ml.

3.1.4.4.29 AAS Grade Tl Standard, 1000 ug/ml.

3.1.4.4.30 AAS Grade Zn Standard, 1000 ug/ml.

3.1.4.4.31 AAS Grade Al Standard, 1000 ug/ml.

3.1.4.4.32 AAS Grade Fe Standard, 1000 ug/ml.

3.1.4.4.33 The metals standards may also be made from solid chemicals as described in EPA Method 200.7. EPA SW-846 Method 7470 or Standard Methods for the Analysis of Water

and Wastewater, 15th Edition, Method 303F should be referred to for additional information on mercury standards.

3.1.4.4.34 Mercury Standards and Quality Control Samples. Prepare fresh weekly a 10 *ug/ml* intermediate mercury standard by adding 5 ml of 1000 *ug/ml* mercury stock solution to a 500-ml volumetric flask; dilute with stirring to 500 ml by first carefully adding 20 ml of 15 percent HNO₃ and then adding water to the 500-ml volume. Mix well. Prepare a 200 ng/ml working mercury standard solution fresh daily: Add 5 ml of the 10 *ug/ml* intermediate standard to a 250-ml volumetric flask and dilute to 250 ml with 5 ml of 4 percent KMnO₄, 5 ml of 15 percent HNO₃, and then water. Mix well. At least six separate aliquots of the working mercury standard solution should be used to prepare the standard curve. These aliquots should contain 0.0, 1.0, 2.0, 3.0, 4.0, and 5.0 ml of the working standard solution containing 0, 200, 400, 600, 800, and 1000 ng mercury, respectively. Quality control samples should be prepared by making a separate 10 *ug/ml* standard and diluting until in the range of the calibration.

3.1.4.4.35 ICAP Standards and Quality Control Samples. Calibration standards for ICAP analysis can be combined into four different mixed standard solutions as shown below.

Mixed Standard Solutions for ICAP Analysis

Solution	Elements
I	As, Be, Cd, Mn, Pb, Se, Zn
II	Ba, Cu, Fe
III	Al, Cr, Ni
IV	Ag, P, Sb, Tl

Prepare these standards by combining and diluting the appropriate volumes of the 1000 *ug/ml* solutions with 5 percent nitric acid. A minimum of one standard and a blank can be used to form each calibration curve. However, a separate quality control sample spiked with known amounts of the target metals in quantities in the midrange of the calibration curve should be prepared. Suggested standard levels are 25 *ug/ml* for Al, Cr, and Pb, 15 *ug/ml* for Fe, and 10 *ug/ml* for the remaining elements. Standards containing less than 1 *ug/ml* of metal should be prepared daily. Standards containing greater than 1 *ug/ml* of metal should be stable for a minimum of 1 to 2 weeks.

3.1.4.4.36 Graphite Furnace AAS Standards. Antimony, arsenic, cadmium, lead, selenium, and thallium. Prepare a 10 *ug/ml* standard by adding 1 ml of 1000 *ug/ml* standard to a 100-ml volumetric flask. Dilute with stirring to 100 ml with 10 percent nitric acid. For graphite furnace AAS, the standards must be matrix matched. Prepare a 100 ng/ml standard by adding 1 ml of the 10 *ug/ml* standard to a 110-ml volumetric flask and dilute to 100 ml with the appropriate matrix solution. Other standards should be prepared by dilution of the 100 ng/ml standards. At least five standards should be used to make up the standard curve. Suggested levels are 0, 10, 50, 75, and 100 ng/ml. Quality control samples should be prepared by making a separate 10 *ug/ml* standard and diluting until it is in the range of the samples. Standards containing less than 1 *ug/ml* of metal should be prepared daily. Standards containing greater than 1 *ug/ml* of metal should be stable for a minimum of 1 to 2 weeks.

3.1.4.4.37 Matrix Modifiers.

3.1.4.4.37.1 Nickel Nitrate, 1 Percent (V/V). Dissolve 4.956 g of Ni(NO₃)₂ · 6H₂O in approximately 50 ml of water in a 100-ml volumetric flask. Dilute to 100 ml with water.

3.1.4.4.37.2 Nickel Nitrate, 0.1 Percent (V/V). Dilute 10 ml of the 1 percent nickel nitrate solution from section 4.4.37.1 above to 100 ml with water. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for As.

3.1.4.4.37.3 Lanthanum. Carefully dissolve 0.5864 g of La₂O₃ in 10 ml of concentrated HNO₃ and dilute the solution by adding it with stirring to approximately 50 ml of water, and then dilute to 100 ml with water. Mix well. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for Pb.

3.1.5 Procedure

3.1.5.1 Sampling. The complexity of this method is such that, to obtain reliable results, testers and analysts should be trained and experienced with the test procedures, including source sampling, reagent preparation and handling, sample handling, analytical calculations, reporting, and descriptions specifically at the beginning of and throughout section 3.1.4 and all other sections of this methodology.

3.1.5.1.1 Pretest Preparation. Follow the same general procedure given in method 5, section 4.1.1, except that, unless particulate emissions are to be determined, the filter need not be desiccated or weighed. All sampling train glassware should first be rinsed with hot tap water and then washed in hot soapy water. Next, glassware should be rinsed three times with tap water, followed by three additional rinses with water. All glassware should then be soaked in a 10 percent (V/V) nitric acid solution for a minimum of 4 hours, rinsed three times with water, rinsed a final time with acetone, and allowed to air dry. All glassware openings where contamination can occur should be covered until the sampling train is assembled for sampling.

3.1.5.1.2 Preliminary Determinations. Same as method 5, section 4.1.2.

3.1.5.1.3 Preparation of Sampling Train. Follow the same general procedures given in method 5, section 4.1.3, except place 100 ml of the nitric acid/hydrogen peroxide solution (section 3.1.4.2.1) in each of the two $\text{HNO}_3/\text{H}_2\text{O}_2$ impingers as shown in Figure 3.1-1 (normally the second and third impingers), place 100 ml of the acidic potassium permanganate absorbing solution (section 3.1.4.2.2) in each of the two permanganate impingers as shown in Figure A-1, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the last impinger. Alternatively, the silica gel may be weighed directly in the impinger just prior to train assembly.

Several options are available to the tester based on the sampling requirements and conditions. The use of an empty first impinger can be eliminated if the moisture to be collected in the impingers will be less than approximately 100 ml. If necessary, use as applicable to this methodology the procedure described in section 7.1.1 of EPA method 101A, 40 CFR part 61, appendix B, to maintain the desired color in the last permanganate impinger.

Retain for reagent blanks volumes of the nitric acid/hydrogen peroxide solution per section 3.1.5.2.9 of this method and of the acidic potassium permanganate solution per section 3.1.5.2.10. These reagent blanks should be labeled and analyzed as described in section 3.1.7. Set up the sampling train as shown in Figure 3.1-1, or if mercury analysis is not to be performed in the train, then it should be modified by removing the two permanganate impingers and the impinger preceding the permanganate impingers. If necessary to ensure leak-free sampling train connections and prevent contamination Teflon tape or other non-contaminating material should be used instead of silicone grease.

Precaution: Extreme care should be taken to prevent contamination within the train. Prevent the mercury collection reagent (acidic potassium permanganate) from contacting any glassware of the train which is washed and analyzed for Mn. Prevent hydrogen peroxide from mixing with the acidic potassium permanganate.

Mercury emissions can be measured, alternatively, in a separate train which measures only mercury emissions by using EPA method 101A with the modifications described below (and with the further modification that the permanganate containers shall be processed as described in the precaution in section 3.1.4.2.2 and the note in section 3.1.5.2.5 of this methodology). This alternative method is applicable for measurement of mercury emissions, and it may be of special interest to sources which must measure both mercury and manganese emissions.

Section 7.2.1 of method 101A shall be modified as follows after the 250 to 400-ml KMnO_4 rinse:

To remove any precipitated material and any residual brown deposits on the glassware following the permanganate rinse, rinse with approximately 100 ml of deionized distilled water, and add this water rinse carefully assuring transfer of all loose precipitated materials from the three permanganate impingers into the permanganate Container No. 1. If no visible deposits remain after this water rinse, do not rinse with 8 N HCl. However, if deposits do remain on the glassware after this water rinse, wash the impinger surfaces with 25 ml of 8 N HCl, and place the wash in a separate sample container labeled Container No. 1.A. containing 200 ml of water

as follows. Place 200 ml of water in a sample container labeled Container No. 1.A. Wash the impinger walls and stem with the HCl by turning the impinger on its side and rotating it so that the HCl contacts all inside surfaces. Use a total of only 25 ml of 8 N HCl for rinsing all permanganate impingers combined. Rinse the first impinger, then pour the actual rinse used for the first impinger into the second impinger for its rinse, etc. Finally, pour the 25 ml of 8 N HCl rinse carefully with stirring into Container No. 1.A. Analyze the HCl rinse separately by carefully diluting with stirring the contents of Container No. 1.A. to 500 ml with deionized distilled water. Filter (if necessary) through Whatman 40 filter paper, and then analyze for mercury according to section 7.4, except limit the aliquot size to a maximum of 10 ml. Prepare and analyze a water diluted blank 8 N HCl sample by using the same procedure as that used by Container No. 1.A., except add 5 ml of 8 N HCl with stirring to 40 ml of water, and then dilute to 100 ml with water. Then analyze as instructed for the sample from Container No. 1.A. Because the previous separate permanganate solution rinse (section 7.2.1) and water rinse (as modified in these guidelines) have the capability to recover a very high percentage of the mercury from the permanganate impingers, the amount of mercury in the HCl rinse in Container No. 1.A. may be very small, possibly even insignificantly small. However, add the total of any mercury analyzed and calculated for the HCl rinse sample Container No. 1.A. to that calculated from the mercury sample from section 7.3.2 which contains the separate permanganate rinse (and water rinse as modified herein) for calculation of the total sample mercury concentration.

3.1.5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in method 5, section 4.1.4.1 (Pretest Leak-Check), section 4.1.4.2 (Leak-Checks During the Sample Run), and section 4.1.4.3 (Post-Test Leak-Checks).

3.1.5.1.5 Sampling Train Operation. Follow the procedures given in method 5, section 4.1.5. For each run, record the data required on a data sheet such as the one shown in Figure 5-2 of method 5.

3.1.5.1.6 Calculation of Percent Isokinetic. Same as method 5, section 4.1.6.

3.1.5.2 Sample Recovery. Begin cleanup procedures as soon as the probe is removed from the stack at the end of a sampling period.

The probe should be allowed to cool prior to sample recovery. When it can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a rinsed, non-contaminating cap over the probe nozzle to prevent losing or gaining particulate matter. Do not cap the probe tip tightly while the sampling train is cooling. This normally causes a vacuum to form in the filter holder, thus causing the undesired result of drawing liquid from the impingers into the filter.

Before moving the sampling train to the cleanup site, remove the probe from the sampling train and cap the open outlet. Be careful not to lose any condensate that might be present. Cap the filter inlet where the probe was fastened. Remove the umbilical cord from the last impinger and cap the impinger. Cap off the filter holder outlet and impinger inlet. Use noncontaminating caps, whether ground-glass stoppers, plastic caps, serum caps, or Teflon tape to close these openings.

Alternatively, the train can be disassembled before the probe and filter holder/oven are completely cooled, if this procedure is followed: Initially disconnect the filter holder outlet/impinger inlet and loosely cap the open ends. Then disconnect the probe from the filter holder or cyclone inlet and loosely cap the open ends. Cap the probe tip and remove the umbilical cord as previously described.

Transfer the probe and filter-impinger assembly to a cleanup area that is clean and protected from the wind and other potential causes of contamination or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions. The sample is recovered and treated as follows (see schematic in Figure 3.1-2). Ensure that all items necessary for recovery of the sample do not contaminate it.

3.1.5.2.1 Container No. 1 (Filter). Carefully remove the filter from the filter holder and place it in its identified petri dish container. Acid-washed polypropylene or Teflon coated tweezers or clean, disposable surgical gloves rinsed with water and dried should be used to handle the filters. If it is necessary to fold the filter, make certain the particulate cake is inside

the fold. Carefully transfer the filter and any particulate matter or filter fibers that adhere to the filter holder gasket to the petri dish by using a dry (acid-cleaned) nylon bristle brush. Do not use any metal-containing materials when recovering this train. Seal the labeled petri dish.

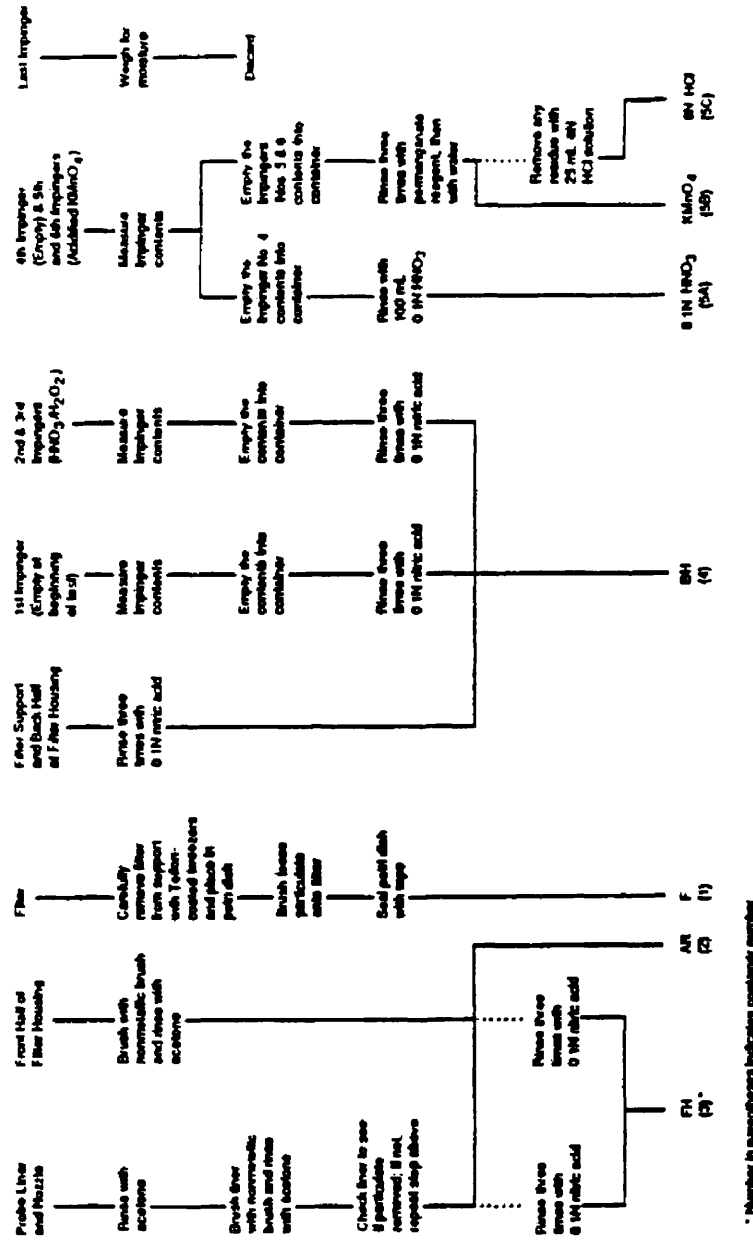


Figure 3.1-2 Sample recovery scheme.

[Appendix IX]

3.1.5.2.2 Container No. 2 (Acetone Rinse).

Note: Perform section 3.1.5.2.2 only if determination of particulate emissions are desired in addition to metals emissions. If only metals emissions are desired, skip section 3.1.5.2.2 and go to section 3.1.5.2.3. Taking care to see that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter and any condensate from the probe nozzle, probe fitting (plastic such as Teflon, polypropylene, etc. fittings are recommended to prevent contamination by metal fittings; further, if desired, a single glass piece consisting of a combined probe tip and probe liner may be used, but such a single glass piece is not a requirement of this methodology), probe liner, and front half of the filter holder by washing these components with 100 ml of acetone and placing the wash in a glass container.

Note: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Distilled water may be used instead of acetone when approved by the Department and shall be used when specified by the Department; in these cases, save a water blank and follow the Department's directions on analysis. Perform the acetone rinses as follows: Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nonmetallic brush. Brush until the acetone rinse shows no visible particles, after which make a final rinse of the inside surface with acetone.

Brush and rinse the sample-exposed, inside parts of the fitting with acetone in a similar way until no visible particles remain.

Rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with acetone. Allow the acetone to drain from the lower end into the sample container. A funnel may be used to aid in transferring liquid washings to the container. Follow the acetone rinse with a nonmetallic probe brush. Hold the probe in an inclined position, squirt acetone into the upper end as the probe brush is being pushed with a twisting action through the probe; hold a sample container underneath the lower end of the probe, and catch any acetone and particulate matter which is brushed through the probe three times or more until none remains in the probe liner on visual inspection. Rinse the brush with acetone, and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above.

It is recommended that two people clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contamination.

Clean the inside of the front half of the filter holder by rubbing the surfaces with a nonmetallic nylon bristle brush and rinsing with acetone. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. After all acetone washings and particulate matter have been collected in the sample container tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether or not leakage occurred during transport. Label the container clearly to identify its contents.

3.1.5.2.3 Container No. 3 (Probe Rinse). Keep the probe assembly clean and free from contamination as described in section 3.1.5.2.2 of this method during the 0.1 N nitric acid rinse described below. Rinse the probe nozzle and fitting probe liner, and front half of the filter holder thoroughly with 100 ml of 0.1 N nitric acid and place the wash into a sample storage container.

Note: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Perform the rinses as applicable and generally as described in method 12, section 5.2.2. Record the volume of the combined rinse. Mark the height of the fluid level on the outside of the storage container and use this mark to determine if leakage occurs during transport. Seal the container and clearly label the contents. Finally, rinse the nozzle, probe liner, and front half of the filter holder with water followed by acetone and discard these rinses.

3.1.5.2.4 Container No. 4 (Impingers 1 through 3, HNO₃/H₂O₂ Impingers and Moisture Knockout Impinger, when used, Contents and Rinses). Due to the potentially large quantity of liquid involved, the tester may place the impinger solutions from impingers 1 through 3 in more than one container. Measure the liquid in the first three impingers volumetrically to within 0.5 ml using a graduated cylinder. Record the volume of liquid present. This information is required to calculate the moisture content of the sampled flue gas. Clean each of the first three

impingers, the filter support, the back half of the filter housing, and connecting glassware by thoroughly rinsing with 100 ml of 0.1 N nitric acid using the procedure as applicable and generally as described in method 12, section 5.2.4.

Note: The use of exactly 100 ml of 0.1 N nitric acid rinse is necessary for the subsequent blank correction procedures. Combine the rinses and impinger solutions, measure and record the volume. Mark the height of the fluid level on the outside of the container to determine if leakage occurs during transport. Seal the container and clearly label the contents.

3.1.5.2.5 Container Nos. 5A, 5B, and 5C. 5A (0.1 N HNO₃), 5B (KMnO₄/H₂SO₄ absorbing solution), and 5C (8 N HCl rinse and dilution). (As described previously at the end of section 3.1.3.1.5 of this method, if mercury is not being measured in this train, then impingers 4, 5, and 6, as shown in Figure 3.1-2, are not necessary and may be eliminated.) Pour all the liquid, if any, from the impinger which was empty at the start of the run and which immediately precedes the two permanganate impingers (normally impinger No. 4) into a graduated cylinder and measure the volume to within 0.5 ml. This information is required to calculate the moisture content of the sampled flue gas. Place the liquid in Sample Container No. 5A. Rinse the impinger (No. 4) with 100 ml of 0.1 N HNO₃ and place this into Container No. 5A.

Pour all the liquid from the two permanganate impingers into a graduated cylinder and measure the volume to within 0.5 ml. This information is required to calculate the moisture content of the sampled flue gas. Place this KMnO₄ absorbing solution stack sample from the two permanganate impingers into Container No. 5B. Using 100 ml total of fresh acidified potassium permanganate solution, rinse the two permanganate impingers and connecting glass pieces a minimum of three times and place the rinses into Container No. 5B, carefully ensuring transfer of all loose precipitated materials from the two impingers into Container No. 5B. Using 100 ml total of water, rinse the permanganate impingers and connecting glass pieces a minimum of three times, and place the rinses into Container 5B, carefully ensuring transfer of all loose precipitated material, if any, from the two impingers into Container No. 5B. Mark the height of the fluid level on the outside of the bottle to determine if leakage occurs during transport. See the following note and the precaution in paragraph 3.1.4.2.2 and properly prepare the bottle and clearly label the contents.

Note: Due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottles. These bottles shall not be completely filled and shall be vented to relieve potential excess pressure. Venting is required. A No. 70-72 hole drilled in the container cap and Teflon liner has been used.

If no visible deposits remain after the above described water rinse, do not rinse with 8 N HCl. However, if deposits do remain on the glassware after this water rinse, wash the impinger surfaces with 25 ml of 8 N HCl, and place the wash in a separate sample container labeled Container No. 5C containing 200 ml of water as follows: Place 200 ml of water in a sample container labeled Container No. 5C. Wash the impinger walls and stem with the HCl by turning the impinger on its side and rotating it so that the HCl contacts all inside surfaces. Use a total of only 25 ml of 8 N HCl for rinsing both permanganate impingers combined. Rinse the first impinger, then pour the actual rinse used for the first impinger into the second impinger for its rinse. Finally, pour the 25 ml of 8 N HCl rinse carefully with stirring into Container No. 5C. Mark the height of the fluid level on the outside of the bottle to determine if leakage occurs during transport.

3.1.5.2.6 Container No. 6 (Silica Gel). Note the color of the indicating silica gel to determine whether it has been completely spent and make a notation of its condition. Transfer the silica gel from its impinger to its original container and seal. The tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger.

The small amount of particles that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel since weight gained in the silica gel impinger is used for moisture calculations. Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g.

3.1.5.2.7 Container No. 7 (Acetone Blank). If particulate emissions are to be determined, at least once during each field test, place a 100-ml portion of the acetone used in the sample

recovery process into a labeled container for use in the front-half field reagent blank. Seal the container.

3.1.5.2.8 Container No. 8A (0.1 N Nitric Acid Blank). At least once during each field test, place 300 ml of the 0.1 N nitric acid solution used in the sample recovery process into a labeled container for use in the front-half and back-half field reagent blanks. Seal the container. Container No. 8B (water blank). At least once during each field test, place 100 ml of the water used in the sample recovery process into a labeled Container No. 8B. Seal the container.

3.1.5.2.9 Container No. 9 (5% Nitric Acid/10% Hydrogen Peroxide Blank). At least once during each field test, place 200 ml of the 5% nitric acid/10% hydrogen peroxide solution used as the nitric acid impinger reagent into a labeled container for use in the back-half field reagent blank. Seal the container.

3.1.5.2.10 Container No. 10 (Acidified Potassium Permanganate Blank). At least once during each field test, place 100 ml of the acidified potassium permanganate solution used as the impinger solution and in the sample recovery process into a labeled container for use in the back-half field reagent blank for mercury analysis. Prepare the container as described in section 3.1.5.2.5.

Note: Due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottles. These bottles shall not be completely filled and shall be vented to relieve potential excess pressure. Venting is required. A No. 70-72 hole drilled in the container cap and Teflon liner has been used.

3.1.5.2.11 Container No. 11 (8 N HCl Blank). At least once during each field test, perform both of the following: Place 200 ml of water into a sample container. Pour 25 ml of 8N HCl carefully with stirring into the 200 ml of water in the container. Mix well and seal the container.

3.1.5.2.12 Container No. 12 (Filter Blank). Once during each field test, place three unused blank filters from the same lot as the sampling filters in a labeled petri dish. Seal the petri dish. These will be used in the front-half field reagent blank.

3.1.5.3 Sample Preparation. Note the level of the liquid in each of the containers and determine if any sample was lost during shipment. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Department, to correct the final results. A diagram illustrating sample preparation and analysis procedures for each of the sample train components is shown in Figure 3.1-3.

3.1.5.3.1 Container No. 1 (Filter). If particulate emissions are being determined, then desiccate the filter and filter catch without added heat and weigh to a constant weight as described in section 4.3 of method 5. For analysis of metals, divide the filter with its filter catch into portions containing approximately 0.5 g each and place into the analyst's choice of either individual microwave pressure relief vessels or Parr Bombs. Add 6 ml of concentrated nitric acid and 4 ml of concentrated hydrofluoric acid to each vessel. For microwave heating, microwave the sample vessels for approximately 12-15 minutes in intervals of 1 to 2 minutes at 600 Watts. For conventional heating, heat the Parr Bombs at 140°C (285°F) for 6 hours. Cool the samples to room temperature and combine with the acid digested probe rinse as required in section 3.1.5.3.3, below.

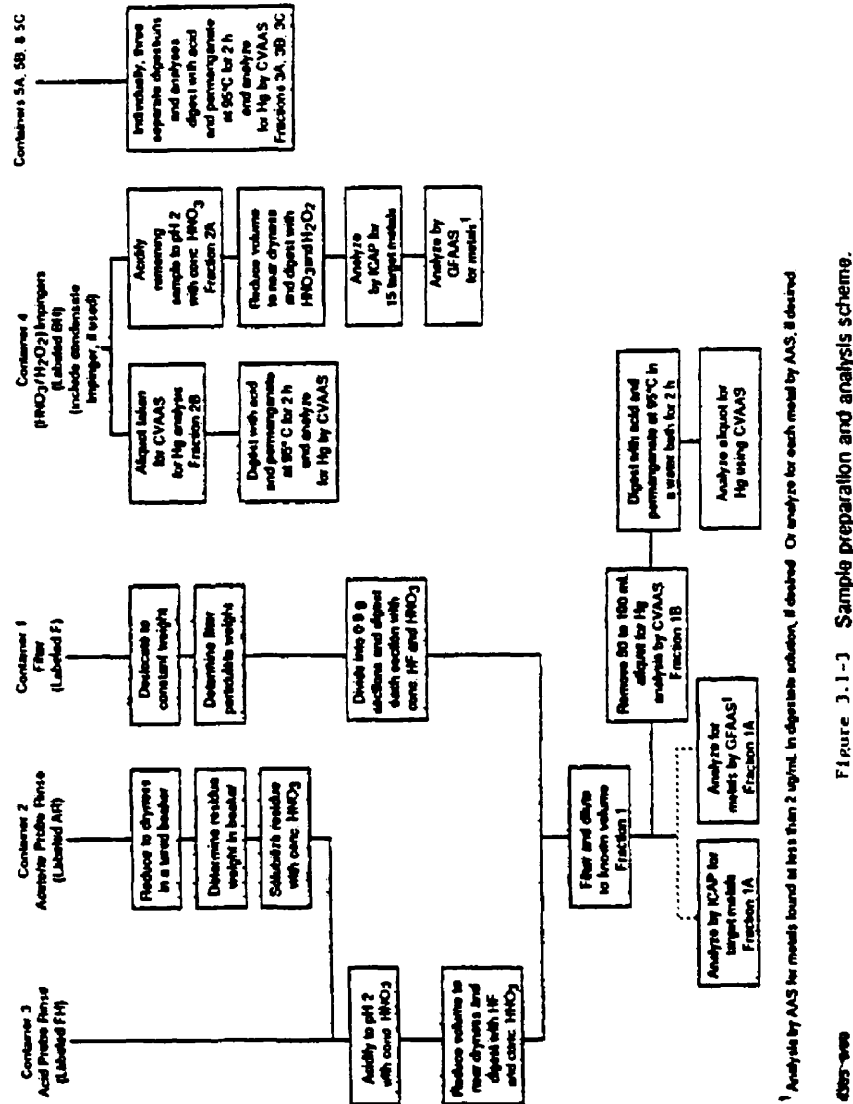


Figure 3.1-3 Sample preparation and analysis scheme.

0305-0000

[Appendix IX]

Notes: 1. Suggested microwave heating times are approximate and are dependent upon the number of samples being digested. Twelve to 15 minute heating times have been found to be acceptable for simultaneous digestion of up to 12 individual samples. Sufficient heating is evidenced by sorbent reflux within the vessel.

2. If the sampling train uses an optional cyclone, the cyclone catch should be prepared and digested using the same procedures described for the filters and combined with the digested filter samples.

3.1.5.3.2 Container No. 2 (Acetone Rinse). Note the level of liquid in the container and confirm on the analysis sheet whether leakage occurred during transport. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results. Measure the liquid in this container either volumetrically to ± 1 ml or gravimetrically to ± 0.5 g. Transfer the contents to an acid-cleaned, tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. If particulate emissions are being determined, desiccate for 24 hours without added heat, weigh to a constant weight according to the procedures described in section 4.3 of method 5, and report the results to the nearest 0.1 mg. Redissolve the residue with 10 ml of concentrated nitric acid and, carefully with stirring, quantitatively combine the resultant sample including all liquid and any particulate matter with Container No. 3 prior to beginning the following section 3.1.5.3.3.

3.1.5.3.3 Container No. 3 (Probe Rinse). The pH of this sample shall be 2 or lower. If the pH is higher, the sample should be acidified to pH 2 by the careful addition with stirring of concentrated nitric acid. The sample should be rinsed into a beaker with water and the beaker should be covered with a ribbed watchglass. The sample volume should be reduced to approximately 20 ml by heating on a hot plate at a temperature just below boiling. Digest the sample in microwave vessels or Parr Bombs by quantitatively transferring the sample to the vessel or bomb, by carefully adding the 6 ml of concentrated nitric acid and 4 ml of concentrated hydrofluoric acid and then continuing to follow the procedures described in section 3.1.5.3.1; then combine the resultant sample directly with the acid digested portions of the filter prepared previously in section 3.1.5.3.1. The resultant combined sample is referred to as Fraction 1 precursor. Filter the combined solution of the acid digested filter and probe rinse samples using Whatman 541 filter paper. Dilute to 300 ml (or the appropriate volume for the expected metals concentration) with water. This dilution is Fraction 1. Measure and record the volume of the Fraction 1 solution to within 0.1 ml. Quantitatively remove a 50-ml aliquot and label as Fraction 1B. Label the remaining 250-ml portion as Fraction 1A. Fraction 1A is used for ICAP or AAS analysis. Fraction 1B is used for the determination of front-half mercury.

3.1.5.3.4 Container No. 4 (Impingers 1-3). Measure and record the total volume of this sample (Fraction 2) to within 0.5 ml. Remove a 75- to 100-ml aliquot for mercury analysis and label as Fraction 2B. Label the remaining portion of Container No. 4 as aliquot Fraction 2A. Aliquot Fraction 2A defines the volume of 2A prior to digestion. All of the aliquot Fraction 2A is digested to produce concentrated Fraction 2A. Concentrated Fraction 2A defines the volume of 2A after digestion which is normally 150 ml. Only concentrated Fraction 2A is analyzed for metals (except that it is not analyzed for mercury). The Fraction 2B aliquot should be prepared and analyzed for mercury as described in section 3.1.5.4.3. Aliquot Fraction 2A shall be pH 2 or lower. If necessary, use concentrated nitric acid, by careful addition and stirring, to lower aliquot Fraction 2A to pH 2. The sample should be rinsed into a beaker with water and the beaker should be covered with a ribbed watchglass. The sample volume should be reduced to approximately 20 ml by heating on a hot plate at a temperature just below boiling. Next follow either the conventional or microwave digestion procedures described in sections 3.1.5.3.4.1 and 3.1.5.3.4.2, below.

3.1.5.3.4.1 Conventional Digestion Procedure. Add 30 ml of 50 percent nitric acid and heat for 30 minutes on a hot plate to just below boiling. Add 10 ml of 3 percent hydrogen peroxide and heat for 20 more minutes. Add 50 ml of hot water and heat the sample for an additional 20 minutes. Cool, filter the sample, and dilute to 150 ml (or the appropriate volume for the expected metals concentrations) with water. This dilution is concentrated Fraction 2A. Measure and record the volume of the Fraction 2A solution to within 0.1 ml.

3.1.5.3.4.2 Microwave Digestion Procedure. Add 10 ml of 50 percent nitric acid and heat for 6 minutes in intervals of 1 to 2 minutes at 600 Watts. Allow the sample to cool. Add 10 ml of 3 percent hydrogen peroxide and heat for 2 more minutes. Add 50 ml of hot water and heat for an additional 5 minutes. Cool, filter the sample, and dilute to 150 ml (or the appropriate volume for the expected metals concentrations) with water. This dilution is concentrated Fraction 2A. Measure and record the volume of the Fraction 2A solution to within 0.1 ml.

Note: All microwave heating times given are approximate and are dependent upon the number of samples being digested at a time. Heating times as given above have been found

acceptable for simultaneous digestion of up to 12 individual samples. Sufficient heating is evidenced by solvent reflux within the vessel.

3.1.5.3.5 Container Nos. 5A, 5B, and 5C (Impingers 4, 5, and 6). Keep these samples separate from each other and measure and record the volumes of 5A and 5B separately to within 0.5 ml. Dilute sample 5C to 500 ml with water. These samples 5A, 5B, and 5C are referred to respectively as Fractions 3A, 3B, and 3C. Follow the analysis procedures described in section 3.1.5.4.3.

Because the permanganate rinse and water rinse have the capability to recover a high percentage of the mercury from the permanganate impingers, the amount of mercury in the HCl rinse (Fraction 3C) may be very small, possibly even insignificantly small. However, as instructed in this method, add the total of any mercury measured in and calculated for the HCl rinse (Fraction 3C) to that for Fractions 1B, 2B, 3A, and 3B for calculation of the total sample mercury concentration.

3.1.5.3.6 Container No. 6 (Silica Gel). Weigh the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

3.1.5.4 Sample Analysis. For each sampling train, seven individual samples are generated for analysis. A schematic identifying each sample and the prescribed sample preparation and analysis scheme is shown in Figure 3.1-3. The first two samples, labeled Fractions 1A and 1B, consist of the digested samples from the front half of the train. Fraction 1A is for ICAP or AAS analysis as described in sections 3.1.5.4.1 and/or 3.1.5.4.2. Fraction 1B is for determination of front-half mercury as described in section 3.1.5.4.3.

The back half of the train was used to prepare the third through seventh samples. The third and fourth samples, labeled Fractions 2A and 2B, contain the digested samples from the moisture knockout, if used, and HNO₃/H₂O₂ Impingers 1 through 3. Fraction 2A is for ICAP or AAS analysis. Fraction 2B will be analyzed for mercury.

The fifth through seventh samples, labeled Fractions 3A, 3B, and 3C, consist of the impinger contents and rinses from the empty and permanganate impingers 4, 5, and 6. These samples are analyzed for mercury as described in section 3.1.5.4.3. The total back-half mercury catch is determined from the sum of Fraction 2B and Fractions 3A, 3B, and 3C.

3.1.5.4.1 ICAP Analysis. Fraction 1A and Fraction 2A are analyzed by ICAP using EPA SW-846 method 6010 or method 200.7 (40 CFR 136, appendix C). Calibrate the ICAP, and set up an analysis program as described in method 6010 or method 200.7. The quality control procedures described in section 3.1.7.3.1 of this method shall be followed. Recommended wavelengths for use in the analysis are listed below:

Element	Wavelength (nm)
Aluminum	308.215
Antimony	206.833
Arsenic	193.696
Barium	455.403
Beryllium	313.042
Cadmium	226.502
Chromium	267.716
Copper	324.754
Iron	259.940
Lead	220.353
Manganese	257.610
Nickel	231.604
Phosphorus	214.914
Selenium	196.026
Silver	328.068
Thallium	190.864
Zinc	213.856

The wavelengths listed are recommended because of their sensitivity and overall acceptance. Other wavelengths may be substituted if they can provide the needed sensitivity and are treated with the same corrective techniques for spectral interference.

Initially, analyze all samples for the desired target metals (except mercury) plus iron and aluminum. If iron and aluminum are present in the sample, the sample may have to be diluted so that each of these elements is at a concentration of less than 50 ppm to reduce their spectral interferences on arsenic, cadmium, chromium, and lead.

Note. When analyzing samples in a hydrofluoric acid matrix, an alumina torch should be used; since all front-half samples will contain hydrofluoric acid, use an alumina torch.

3.1.5.4.2 AAS by Direct Aspiration and/or Graphite Furnace. If analysis of metals in Fraction 1A and Fraction 2A using graphite furnace or direct aspiration AAS is desired, Table 3.1-2 should be used to determine which techniques and methods should be applied for each target metal. Table 3.1-2 should also be consulted to determine possible interferences and techniques to be followed for their minimization. Calibrate the instrument according to section 3.1.6.3 and follow the quality control procedures specified in section 3.1.7.3.2.

Table 3.1-2-Applicable Techniques, Methods, and Minimization of Interference for AAS Analysis

Metal	Technique	SW-846 Method No.	Wavelength (nm)	Interferences	
				Cause	Minimization
Sb	Aspiration	7040	217.6	1000 mg/mL Pb Ni, Cu, or acid	Use secondary wavelength of 231.1 nm; match sample & standards' acid concentration or use nitrous oxide/acetylene flame.
Sb	Furnace	7041	217.6	High Pb	Secondary wavelength or Zeeman correction.
As	Furnace	7060	193.7	Arsenic volatilization	Spiked samples and add nickel nitrate solution to digestates prior to analysis.
				Aluminum	Use Zeeman background correction.
Ba	Aspiration	7080	553.6	Calcium	High hollow cathode current and narrow band set.
				Barium ionization	2 mL of KCl per 100 mL of sample.
Be	Aspiration	7090	234.9	500 ppm Al	Add 0.1% fluoride.
Be	Furnace	7091	234.9	Be in optical path	Optimize parameters to minimize effects.
Cd	Aspiration	7130	228.8	Absorption and light scattering	Background correction is required.
Cd	Furnace	7131	228.8	As above	As above.
				Excess chloride	Ammonium phosphate used as a matrix modifier.
				Pipet tips	Use cadmium-free tips.
Cr	Aspiration	7190	357.9	Alkali metal	KCl ionization suppressant in samples and standards.
				Absorption and scatter	Consult manufacturer's literature.
Cr	Furnace	7191	357.9	200 mg/L Ca and P	All calcium nitrate for a known constant effect and to eliminate effect of phosphate.
Cu	Aspiration	7210	324.7	Absorption and scatter	Consult manufacturer's manual.
Fe	Aspiration	7380	248.3	Contamination	Great care taken to avoid contamination.
Pb	Aspiration	7420	283.3	217.0 nm alternate	Background correction required.
Pb	Furnace	7421	283.3	Poor recoveries	Matrix modifier, add 10 uL of phosphorus acid to 1 mL of prepared sample in sampler cup.
Mn	Aspiration	7460	279.5	403.1 nm alternate	Background correction required.
N	Aspiration	7520	232.0	352.4 nm alternate	Background correction required.
				Fe, Co, and Cr	Matrix matching or nitrous-oxide/acetylene flame.
				Nonlinear response	Sample dilution or use 352.3 nm line.
Se	Furnace	7740	196.0	Volatility	Spike samples and reference materials and add nickel nitrate to minimize volatilization.
				Adsorption & scatter	Background correction is required and Zeeman background correction can be useful.
Ag	Aspiration	7760	328.1	Adsorption & scatter	Background correction is required.
				AgCl insoluble	Avoid hydrochloric acid unless silver is in solution as a chloride complex.
				Viscosity	Sample and standards monitored for aspiration rate.

Metal	Technique	SW-846 Method No.	Wavelength (nm)	Interferences	
				Cause	Minimization
Tl	Aspiration	7840	276.8		Background correction is required. Hydrochloric acid should not be used.
Tl	Furnace	7841	276.8	Hydrochloric acid or chloride	Background correction is required. Verify that losses are not occurring for volatilization by spiked samples or standard addition; Palladium is a suitable matrix modifier.
Zn	Aspiration	7950	213.9	High Si, Cu, & P Contamination	Strontium removes Cu and phosphate. Great care taken to avoid contamination.

3.1.5.4.3 Cold Vapor AAS Mercury Analysis. Fraction 1B, Fraction 2B, and Fractions 3A, 3B, and 3C should be analyzed separately for mercury using cold vapor atomic absorption spectroscopy following the method outlined in EPA SW-846 method 7470 or in Standard Methods for Water and Wastewater Analysis, 15th Edition, Method 303F. Set up the calibration curve (zero to 1000 ng) as described in SW-846 method 7470 or similar to method 303F, using 300-ml BOD bottles instead of Erlenmeyers. Dilute separately, as described below, a 1 ml to 10 ml aliquot of each original sample to 100 ml with water. Record the amount of the aliquot used for dilution to 100 ml. If no prior knowledge exists of the expected amount of mercury in the sample, a 5-ml aliquot is suggested for the first dilution to 100 ml and analysis. To determine the stack emission value for mercury, the amount of the aliquot of the sample used for dilution and analysis is dependent on the amount of mercury in the aliquot: The total amount of mercury in the aliquot used for analysis shall be less than 1 ug, and within the range (zero to 1000 ng) of the calibration curve. Place each sample aliquot into a separate 300-ml BOD bottle and add enough Type II water to make a total volume of 100 ml. Then analyze the 100 ml for mercury by adding to it sequentially the sample preparation solutions and performing the sample preparation and analysis as described in the procedures of SW-846 method 7470 or method 303F. If, during the described analysis, the reading maximum(s) are off-scale (because the aliquot of the original sample analyzed contained more mercury than the maximum of the calibration range) including the analysis of the 100-ml dilution of the 1-ml aliquot of the original sample causing a reading maximum which is off-scale, then perform the following: Dilute the original sample (or a portion of it) with 0.15% HNO₃ in water (1.5 ml concentrated HNO₃ per liter aqueous solution) so that when a 1-ml to 10-ml aliquot of the dilution of the original sample is then further diluted to 100 ml in the BOD bottle, and analyzed by the procedures described above, it will yield an analysis within the range of the calibration curve.

3.1.6 Calibration

Maintain a laboratory log of all calibrations.

3.1.6.1 Sampling Train Calibration. Calibrate the sampling train components according to the indicated sections of method 5: Probe Nozzle (section 5.1); Pitot Tube (section 5.2); Metering System (section 5.3); Probe Heater (section 5.4); Temperature Gauges (section 5.5); Leak-Check of the Metering System (section 5.6); and Barometer (section 5.7).

3.1.6.2 Inductively Coupled Argon Plasma Spectrometer Calibration. Prepare standards as outlined in section 3.1.4.4. Profile and calibrate the instrument according to the instrument manufacturer's recommended procedures using the above standards. The instrument calibration should be checked once per hour. If the instrument does not reproduce the concentrations of the standard within 10 percent, the complete calibration procedures should be performed.

3.1.6.3 Atomic Absorption Spectrometer-Direct Aspiration, Graphite Furnace and Cold Vapor Mercury Analyses. Prepare the standards as outlined in section 3.1.4.4. Calibrate the spectrometer using these prepared standards. Calibration procedures are also outlined in the EPA methods referred to in Table 3.1-2 and in SW-846 Method 7470 or Standard Methods for Water and Wastewater, 15th Edition, method 303F (for mercury). Each standard curve should be run in duplicate and the mean values used to calculate the calibration line. The instrument should be recalibrated approximately once every 10 to 12 samples.

3.1.7 Quality Control

3.1.7.1 Sampling. Field Reagent Blanks. When analyzed, the blank samples in Container Numbers 7 through 12 produced previously in sections 3.1.5.2.7 through 3.1.5.2.12, respectively, shall be processed, digested, and analyzed as follows: Digest and process one of the filters from Container No. 12 per section 3.1.5.3.1, 100 ml from Container No. 7 per section 3.1.5.3.2, and

100 ml from Container No. 8A per section 3.1.5.3.3. This produces Fraction Blank 1A and Fraction Blank 1B from Fraction Blank 1. (If desired, the other two filters may be digested separately according to section 3.1.5.3.1, diluted separately to 300 ml each, and analyzed separately to produce a blank value for each of the two additional filters. If these analyses are performed, they will produce two additional values for each of Fraction Blank 1A and Fraction Blank 1B. The three Fraction Blank 1A values will be calculated as three values of M_{FHB} in Equation 3 of section 3.1.8.4.3, and then the three values shall be totalled and divided by 3 to become the value M_{FHB} to be used in the computation of M_t by Equation 3. Similarly, the three Fraction Blank 1B values will be calculated separately as three values, totalled, averaged, and used as the value for Hg_{fhb} in Equation 8 of section 3.1.8.5.3. The analyses of the two extra filters are optional and are not a requirement of this method, but if the analyses are performed, the results must be considered as described above.) Combine 100 ml of Container No. 8A with 200 ml of the contents of Container No. 9 and digest and process the resultant volume per section 3.1.5.3.4. This produces concentrated Fraction Blank 2A and Fraction Blank 2B from Fraction Blank 2. A 100-ml portion of Container No. 8A is Fraction Blank 3A. Combine 100 ml of the contents of Container No. 10 with 33 ml of the contents of Container No. 8B. This produces Fraction Blank 3B (use 400 ml as the volume of Fraction Blank 3B when calculating the blank value. Use the actual volumes when calculating all the other blank values). Dilute 225 ml of the contents of Container No. 11 to 500 ml with water. This produces Fraction Blank 3C. Analyze Fraction Blank 1A and Fraction Blank 2A per section 3.1.5.4.1 and/or 3.1.5.4.2. Analyze Fraction Blank 1B, Fraction Blank 2B, and Fraction Blanks 3A, 3B, and 3C per section 3.1.5.4.3. The analysis of Fraction Blank 1A produces the front-half reagent blank correction values for the metals except mercury; the analysis of Fraction Blank 1B produces the front-half reagent blank correction value for mercury. The analysis of concentrated Fraction Blank 2A produces the back-half reagent blank correction values for the metals except mercury, while separate analysis of Fraction Blanks 2B, 3A, 3B, and 3C produce the back-half reagent blank correction value for mercury.

3.1.7.2 An attempt may be made to determine if the laboratory reagents used in section 3.1.5.3 caused contamination. They should be analyzed by the procedures in section 3.1.5.4. The Administrator will determine whether the laboratory blank reagent values can be used in the calculation of the stationary source test results.

3.1.7.3 Quality Control Samples. The following quality control samples should be analyzed.

3.1.7.3.1 ICAP Analysis. Follow the quality control shown in section 8 of method 6010. For the purposes of a three-run test series, these requirements have been modified to include the following: Two instrument check standard runs, two calibration blank runs, one interference check sample at the beginning of the analysis (must be within 25% or analyze by the method of standard additions), one quality control sample to check the accuracy of the calibration standards (must be within 25% of calibration), and one duplicate analysis (must be within 10% of average or repeat all analyses).

3.1.7.3.2 Direct Aspiration and/or Graphite Furnace AAS Analysis for antimony, arsenic, barium, beryllium, cadmium, copper, chromium, lead, nickel, manganese, mercury, phosphorus, selenium, silver, thallium, and zinc. All samples should be analyzed in duplicate. Perform a matrix spike on at least one front-half sample and one back-half sample or one combined sample. If recoveries of less than 75 percent or greater than 125 percent are obtained for the matrix spike, analyze each sample by the method of standard additions. A quality control sample should be analyzed to check the accuracy of the calibration standards. The results must be within 10% or the calibration repeated.

3.1.7.3.3 Cold Vapor AAS Analysis for Mercury. All samples should be analyzed in duplicate. A quality control sample should be analyzed to check the accuracy of the calibration standards (within 15% or repeat calibration). Perform a matrix spike on one sample from the nitric impinger portion (must be within 25% or samples must be analyzed by the method of standard additions). Additional information on quality control can be obtained from EPA SW-846 method 7470 or in Standard Methods for the Examination of Water and Wastewater, 15th Edition, method 303F.

3.1.8 Calculations

3.1.8.1 Dry Gas Volume. Using the data from this test, calculate $V_{M(STD)}$, the dry gas sample volume at standard conditions as outlined in Section 6.3 of Method 5.

3.1.8.2 Volume of Water Vapor and Moisture Content. Using the data obtained from this test, calculate the volume of water vapor $V_{W(STD)}$ and the moisture content B_{WS} of the stack gas. Use Equations 5-2 and 5-3 of Method 5.

3.1.8.3 Stack Gas Velocity. Using the data from this test and Equation 2-9 of Method 2, calculate the average stack gas velocity.

3.1.8.4 Metals (Except Mercury) in Source Sample.

3.1.8.4.1 Fraction 1A, Front Half, Metals (except Hg). Calculate separately the amount of each metal collected in Fraction 1 of the sampling train using the following equation:

$$M_{FH} = C_{A1} F_D V_{SOLN,1} \text{ Eq.1*}$$

* If Fractions 1A and 2A are combined, proportional aliquots must be used. Appropriate changes must be made in Equations 1-3 to reflect this approach.

where:

M_{FH} = total mass of each metal (except Hg) collected in the front half of the sampling train (Fraction 1), *ug*.

C_{A1} = concentration of metal in sample Fraction 1A as read from the standard curve *ug/ml*.

F_D = dilution factor (F_D = the inverse of the fractional portion of the concentrated sample in the solution actually used in the instrument to produce the reading C_{A1} . For example, when 2 ml of Fraction 1A are diluted to 10 ml, $F_D = 5$).

$V_{SOLN,1}$ = total volume of digested sample solution (Fraction 1), ml.

3.1.8.4.2 Fraction 2A, Back Half, Metals (except Hg). Calculate separately the amount of each metal collected in Fraction 2 of the sampling train using the following equation:

$$M_{BH} = C_{A2} F_A V_A \text{ Eq.2*}$$

where:

M_{BH} = total mass of each metal (except Hg) collected in the back half of the sampling train (Fraction 2), *ug*.

C_{A2} = concentration of metal in sample concentrated Fraction 2A, as read from the standard curve (*ug/ml*).

F_A = aliquot factor, volume of Fraction 2 divided by volume of aliquot Fraction 2A (see section 3.1.5.3.4).

V_A = total volume of digested sample solution (concentrated Fraction 2A), ml (see section 3.1.5.3.4.1 or 3.1.5.3.4.2, as applicable).

3.1.8.4.3 Total Train, Metals (except Hg). Calculate the total amount of each of the quantified metals collected in the sampling train as follows:

$$M_T = (M_{FH} - M_{FHB}) + (M_{BH} - M_{BHB}) \text{ Eq.3*}$$

where:

M_T = total mass of each metal (separately stated for each metal) collected in the sampling train, *ug*.

M_{FHB} = blank correction value for mass of metal detected in front-half field reagent blank, *ug*.

M_{BHB} = blank correction value for mass of metal detected in back-half field reagent blank, *ug*.

Note: If the measured blank value for the front half (m_{FHB}) is in the range 0.0 to A *ug* where A *ug* equals the value determined by multiplying 1.4 *ug* per square inch (1.4 *ug/in*² per square inch times the actual area in square inches (*in*²) of the filter used in the emission sample) m_{FHB} may be used to correct the emission sample value (m_{FH}); if m_{FHB} exceeds A *ug*, the greater of the two following values (either I. or II.) may be used:

I. A *ug*, or

II. the lesser of (a) m_{FHB} , or (b) 5 percent of m_{FH} . If the measured blank value for the back half (m_{BHB}) is in the range of 0.0 to 1 μg , m_{BHB} may be used to correct the emission sample value (m_{BH}); if m_{BHB} exceeds 1 μg , the greater of the two following values may be used: 1 μg or 5 percent of m_{BH} .

3.1.8.5 Mercury in Source Sample.

3.1.8.5.1 Fraction 1B, Front Half, Hg. Calculate the amount of mercury collected in the front half, Fraction 1, of the sampling train using the following equation:

$$\text{Hg}_{\text{fh}} = \frac{Q_{\text{fh}}}{V_{\text{f1B}}} \times V_{\text{soln},1} \quad \text{Eq. 4}$$

where:

Hg_{FH} = total mass of mercury collected in the front half of the sampling train (Fraction 1), μg .

Q_{FH} = quantity of mercury in analyzed sample, μg .

$V_{\text{SOL N},1}$ = total volume of digested sample solution (Fraction 1), ml.

V_{F1B} = volume of Fraction 1B analyzed, ml.

See the following notice.

Note: V_{F1B} is the actual amount of Fraction 1B analyzed. For example, if 1 ml of Fraction 1B were diluted to 100 ml to bring it into the proper analytical range, and 1 ml of the 100-ml dilution were analyzed, V_{F1B} would be 0.01 ml.

3.1.8.5.2 Fraction 2B and Fractions 3A, 3B, and 3C, Back Half, Hg. Calculate the amount of mercury collected in Fractions 2 using Equation 5 and in Fractions 3A, 3B, and 3C using Equation 6. Calculate the total amount of mercury collected in the back half of the sampling train using Equation 7.

$$\text{Hg}_{\text{bh2}} = \frac{Q_{\text{bh2}}}{V_{\text{f2B}}} \times V_{\text{soln},2} \quad \text{Eq.5}$$

where:

$\text{Hg}_{\text{GB H2}}$ = total mass of mercury collected in Fraction 2, μg .

$Q_{\text{B H2}}$ = quantity of mercury in analyzed sample, μg .

$V_{\text{SOL N},2}$ = total volume of Fraction 2, ml.

$V_{\text{F 2B}}$ = volume of Fraction 2B analyzed, ml (see the following note).

Note: V_{F2B} is the actual amount of Fraction 2B analyzed. For example, if 1 ml of Fraction 2B were diluted to 10 ml to bring it into the proper analytical range, and 5 ml of the 10-ml dilution was analyzed, V_{F2B} would be 0.5.

Use Equation 6 to calculate separately the back-half mercury for Fractions 3A, then 3B, then 3C.

$$\text{Hg}_{\text{bh3(A,B,C)}} = \frac{Q_{\text{bh3(A,B,C)}}}{V_{\text{f3(A,B,C)}}} \times V_{\text{soln},3(\text{A,B,C})} \quad \text{Eq. 6}$$

where:

Hg_{BH3} (infrfa; infrfb; c) = total mass of mercury collected separately in Fraction 3A, 3B, or 3C, μg .

$Q_{\text{BH3 (A,B,C)}}$ = quantity of mercury in separately analyzed samples, μg .

$V_{\text{F3 (A,B,C)}}$ = volume of Fraction 3A, 3B, or 3C analyzed, ml (see Note in sections 3.1.8.5.1 and 3.1.8.5.2, and calculate similarly).

$V_{\text{SOLN (A,R,C)}}$ = total volume of Fraction 3A, 3B, or 3C, ml.

$\text{Hg}_{\text{BH}} = \text{Hg}_{\text{BH2}} + \text{Hg}_{\text{BH3A}} + \text{Hg}_{\text{BH3B}} + \text{Hg}_{\text{BH 3C}}$ Eq. 7

where:

Hg_{BH} = total mass of mercury collected in the back half of the sampling train, *ug*.

3.1.8.5.3 Total Train Mercury Catch. Calculate the total amount of mercury collected in the sampling train using Equation 8.

$$Hg_T = (Hg_{FH} - Hg_{FHB}) + (Hg_{BH} - Hg_{BHB})$$

where:

Hg_I = total mass of mercury collected in the sampling train *ug*.

Hg_{FHB} = blank correction value for mass of mercury detected in front-half field reagent blank, *ug*.

Hg_{FHB} = blank correction value for mass of mercury detected in back-half field reagent blank, *ug*.

Note: If the total of the measured blank values ($Hg_{FHB} + Hg_{BHB}$) is in the range of 0 to 6 *ug*, then the total may be used to correct the emission sample value ($Hg_{FH} + Hg_{BH}$); if it exceeds 6 *ug*, the greater of the following two values may be used; 6 *ug* or 5 percent of the emission sample value ($Hg_{FH} + Hg_{BH}$).

3.1.8.6 Metal Concentration of Stack Gas. Calculate each metal separately for the cadmium, total chromium, arsenic, nickel, manganese, beryllium, copper, lead, phosphorus, thallium, silver, barium, zinc, selenium, antimony, and mercury concentrations in the stack gas (dry basis, adjusted to standard conditions) as follows:

C_A = concentration of each metal in the stack gas, mg/dscm. Eq. 9

$$K_4 = 10^3 \text{ mg/ug.}$$

M_T = total mass of each metal collected in the sampling train, *ug*.

$V_{M(STD)}$ = volume of gas sample as measured by the dry gas meter, corrected to dry standard conditions, dscm.

3.1.8.7 Isokinetic Variation and Acceptable Results. Same as method 5, sections 6.11 and 6.12, respectively.

3.1.9 Bibliography

3.1.9.1 Method 303F in Standard Methods for the Examination of Water and Wastewater, 15th Edition, 1980. Available from the American Public Health Association, 1015 18th Street NW., Washington, DC 20036.

3.1.9.2 EPA Methods 6010, 7000, 7041, 7060, 7131, 7421, 7470, 7740, and 7841. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Third Edition. September 1988. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC 20460.

3.1.9.3 EPA Method 200.7, Code of Federal Regulations, title 40, part 136, appendix C. July 1, 1987.

3.1.9.4 EPA Methods 1 through 5, and 12 Code of Federal Regulations, title 40, part 60, appendix A, July 1, 1987.

3.2 Determination of Hexavalent Chromium Emissions from Stationary Sources (Method Cr+⁶)

3.2.1 Applicability and Principle

3.2.1.1 Applicability. This method applies to the determination of hexavalent chromium (Cr+⁶) emissions from hazardous waste incinerators, municipal waste combustors, sewage sludge incinerators, and boilers and industrial furnaces. With the approval of the Department, this method may also be used to measure total chromium. The sampling train, constructed of Teflon components, has only been evaluated at temperatures less than 300 °F. Trains constructed of other materials, for testing at higher temperatures, are currently being evaluated.

3.2.1.2 Principle. For incinerators and combustors, the Cr+⁶ emissions are collected isokinetically from the source. To eliminate the possibility of Cr+⁶ reduction between the nozzle and impinger, the emission samples are collected with a recirculatory train where the impinger reagent is continuously recirculated to the nozzle. Recovery procedures include a post-sampling purge and filtration. The impinger train samples are analyzed for Cr+⁶ by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The IC/PCR separates the Cr+⁶ as

chromate (CrO_4^{6-}) from other components in the sample matrices that may interfere with the Cr^{6+} -specific diphenylcarbazide reaction that occurs in the post-column reactor. To increase sensitivity for trace levels of chromium, a preconcentration system is also used in conjunction with the IC/PCR.

3.2.2 Range, Sensitivity, Precision, and Interference

3.2.2.1 Range. Employing a preconcentration procedure, the lower limit of the detection range can be extended to 16 nanograms per dry standard cubic meter (ng/dscm) with a 3 dscm gas sample (0.1 ppb in solution). With sample dilution, there is no upper limit.

3.2.2.2 Sensitivity. A minimum detection limit of 8 ng/dscm with a 3 dscm gas sample can be achieved by preconcentration (0.05 ppb in solution).

3.2.2.3 Precision. The precision of the IC/PCR with sample preconcentration is 5 to 10 percent. The overall precision for sewage sludge incinerators emitting 120 ng/dscm of Cr^{6+} and 3.5 $\mu\text{g}/\text{dscm}$ of total chromium is 25% and 9% for Cr^{6+} and total chromium, respectively; for hazardous waste incinerators emitting 300 ng/dscm of Cr^{6+} it is 20 percent.

3.2.2.4 Interference. Components in the sample matrix may cause Cr^{6+} to convert to trivalent chromium (Cr^{3+}) or cause Cr^{3+} to convert to Cr^{6+} . A post-sampling nitrogen purge and sample filtration are included to eliminate many of these interferences. The chromatographic separation of Cr^{6+} using ion chromatography reduces the potential for other metals to interfere with the post-column reaction. For the IC/PCR analysis, only compounds that coelute with Cr^{6+} and affect the diphenylcarbazide reaction will cause interference. Periodic analysis of deionized (DI) water blanks is used to demonstrate that the analytical system is essentially free from contamination. Sample cross-contamination that can occur when high-level and low-level samples or standards are analyzed alternately is eliminated by thorough purging of the sample loop. Purging can easily be achieved by increasing the injection volume of the samples to ten times the size of the sample loop.

3.2.3 Apparatus

3.2.3.1 Sampling Train. Schematics of the recirculating sampling trains employed in this method are shown in Figures 3.2-1 and 3.2-2. The recirculatory train is readily assembled from commercially available components. All portions of the train in contact with the sample are either glass, quartz, Tygon, or Teflon, and are to be cleaned as per subsection 3.2.5.1.1.

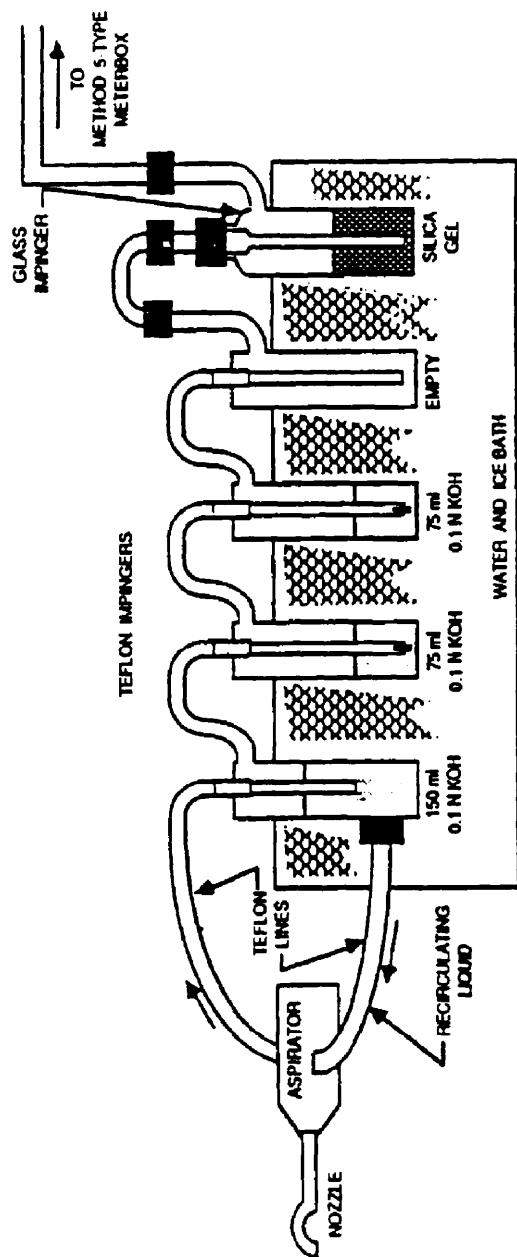


Figure 3.2-1 Schematic of recirculatory impinger train with aspirator assembly.

[Appendix

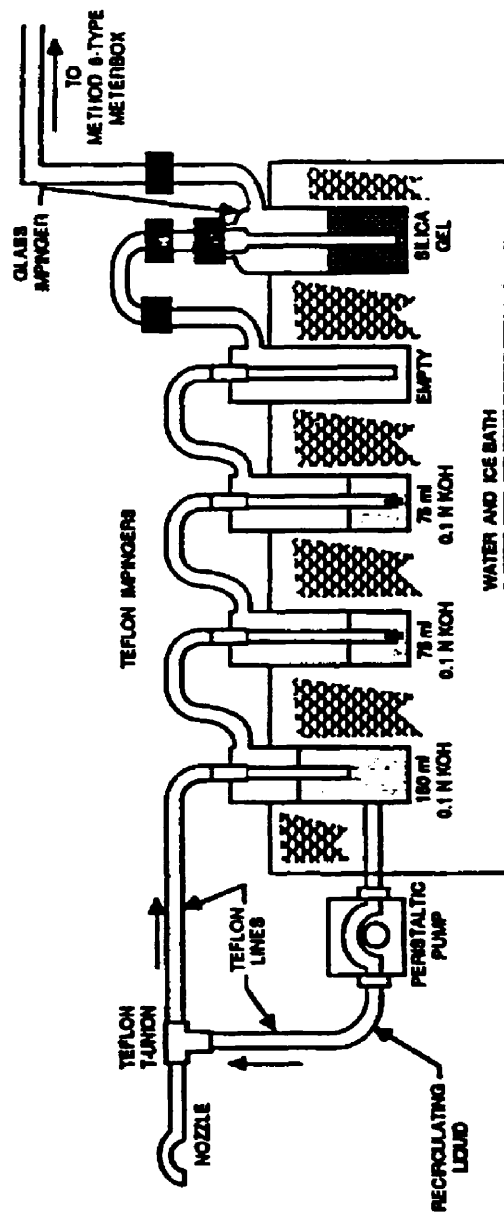


Figure 3.2-2 Schematic of recirculatory impinger train with pump/sprayer assembly.

[Appendix IX]

The metering system is identical to that specified by Method 5 (see section 3.8.1); the sampling train consists of the following components:

3.2.3.1.1 Probe Nozzle. Glass or Teflon with a sharp, tapered leading edge. The angle of taper shall be $\geq 30^\circ$ and the taper shall be on the outside to preserve a constant internal diameter. The probe nozzle shall be of the button-hook or elbow design, unless otherwise specified by the Administrator.

A range of nozzle sizes suitable for isokinetic sampling should be available, e.g., 0.32 to 1.27 cm ($\frac{1}{8}$ to $\frac{1}{2}$ in) (or larger if higher volume sample trains are used) inside diameter (ID) nozzles in increments of 0.16 cm ($\frac{1}{16}$ in). Each nozzle shall be calibrated according to the procedures outlined in section 3.2.6.

3.2.3.1.2 Teflon Aspirator or Pump/Sprayer Assembly. Teflon aspirator capable of recirculating absorbing reagent at 50 ml/min while operating at 0.75 cfm. Alternatively, a pump/sprayer assembly may be used instead of the Teflon aspirator. A Teflon union-T is connected behind the nozzle to provide the absorbing reagent/sample gas mix; a peristaltic pump is used to recirculate the absorbing reagent at a flow rate of at least 50 ml/min. Teflon fittings, Teflon ferrules, and Teflon nuts are used to connect a glass or Teflon nozzle, recirculating line, and sample line to the Teflon aspirator or union-T. Tygon, C-flex** or other suitable inert tubing for use with peristaltic pump.

*Note: Mention of trade names or specific product does not constitute endorsement by the South Carolina Department of Health and Environmental Control.

3.2.3.1.3 Teflon Sample Line. Teflon, $\frac{3}{8}$ " outside diameter (OD) and $\frac{1}{4}$ " inside diameter (ID), or $\frac{1}{2}$ " OD \times $\frac{3}{8}$ " ID, of suitable length to connect aspirator (or T-union) to first Teflon impinger.

3.2.3.1.4 Teflon Recirculation Line. Teflon, $\frac{1}{4}$ " O.D. and $\frac{1}{8}$ I.D., of suitable length to connect first impinger to aspirator (or T-union).

3.2.3.1.5 Teflon Impingers. Four Teflon Impingers; Teflon tubes and fittings, such as made by Savillex** can be used to construct impingers 2" diameter by 12" long, with vacuum-tight $\frac{3}{8}$ " O.D. Teflon compression fittings. Alternatively, standard glass impingers that have been Teflon-lined, with Teflon stems and U-tubes, may be used. Inlet fittings on impinger top to be bored through to accept $\frac{3}{8}$ " O.D. tubing as impinger stem. The second and third $\frac{3}{8}$ " OD Teflon stem has a $\frac{1}{4}$ " OD Teflon tube, 2" long, inserted at its end to duplicate the effects of the Greenburg-Smith impinger stem. The first impinger stem should extend 2" from impinger bottom, high enough in the impinger reagent to prevent air from entering recirculating line; the second and third impinger stems should extend to $\frac{1}{2}$ " from impinger bottom. The first impinger should include a $\frac{1}{4}$ " O.D. Teflon compression fitting for recirculation line. The fourth impinger serves as a knockout impinger.

3.2.3.1.6 Glass Impinger. Silica gel impinger. Vacuum-tight impingers, capable of containing 400 g of silica gel, with compatible fittings. The silica gel impinger will have a modified stem ($\frac{1}{2}$ " ID at tip of stem).

3.2.3.1.7 Thermometer, (identical to that specified by Method 5) at the outlet of the silica gel impinger, to monitor the exit temperature of the gas.

3.2.3.1.8 Metering System, Barometer, and Gas Density Determinations Equipment. Same as method 5, sections 2.1.8 through 2.1.10, respectively.

3.2.3.2 Sample Recovery. Clean all items for sample handling or storage with 10% nitric acid solution by soaking, where possible, and rinse thoroughly with DI water before use.

3.2.3.2.1 Nitrogen Purge Line. Inert tubing and fittings capable of delivering 0 to 1 scf/min (continuously adjustable) of nitrogen gas to the impinger train from a standard gas cylinder (see Figure 3.2.3). Standard $\frac{3}{8}$ -inch Teflon tubing and compression fittings in conjunction with an adjustable pressure regulator and needle valve may be used.

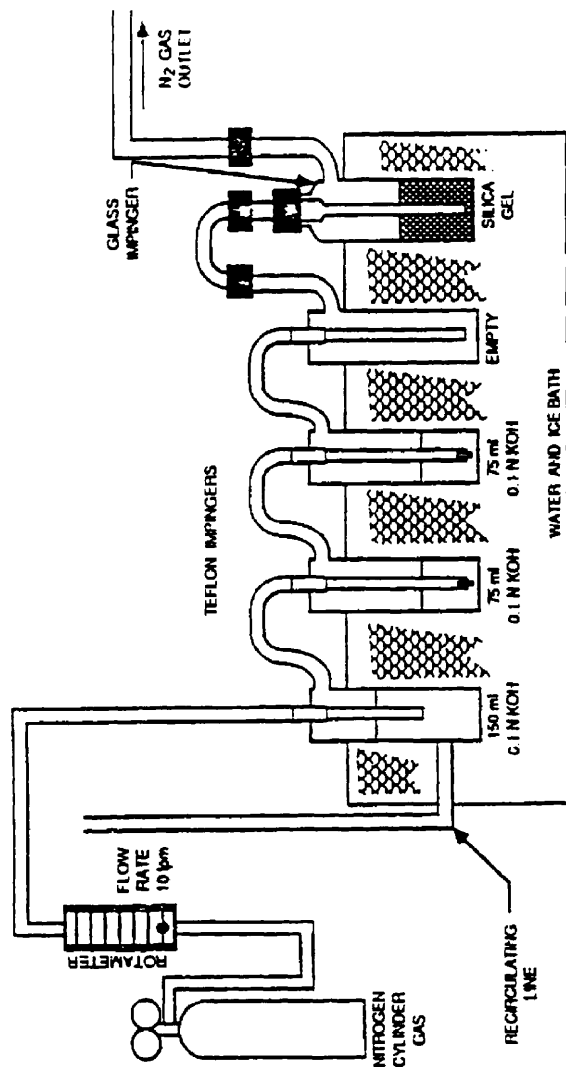


Figure 3.2-3 Schematic of post test nitrogen purge system

[Appendix IX

- 3.2.3.2.2 Wash bottles. Two polyethylene wash bottles, for DI water and nitric rinse solution.
- 3.2.3.2.3 Sample Storage Containers. Polyethylene, with leak-free screw cap, 500-ml or 1000-ml.
- 3.2.3.2.4 1000-ml Graduated Cylinder.
- 3.2.3.2.5 Plastic Storage Containers. Air tight containers to store silica gel.
- 3.2.3.2.6 Funnel and Rubber Policeman. To aid in transfer of silica gel from impinger to storage container; not necessary if silica gel is weighed directly in the impinger.
- 3.2.3.2.7 Balance.

3.2.3.3 Sample Preparation for Analysis. Sample preparation prior to analysis includes purging the sample train immediately following the sample run, and filtering the recovered sample to remove particulate matter immediately following recovery.

3.2.3.3.1 Beakers, Funnels, Volumetric Flasks, Volumetric Pipets, and Graduated Cylinders. Assorted sizes, Teflon or glass, for preparation of samples, sample dilution, and preparation of calibration standards. Prepare initially following procedure described in section 3.2.5.1.3 and rinse between use with 0.1 N HNO₃ and DI water.

3.2.3.3.2 Filtration Apparatus. Teflon, or equivalent, for filtering samples, and Teflon filter holder. Teflon impinger components have been found to be satisfactory as a sample reservoir for pressure filtration using nitrogen.

3.2.3.4 Analysis.

3.2.3.4.1 IC/PCR System. High performance liquid chromatograph pump, sample injection valve, post-column reagent delivery and mixing system, and a visible detector, capable of operating at 520 nm, all with a non-metallic (or inert) flow path. An electronic recording integrator operating in the peak area mode is recommended, but other recording devices and integration techniques are acceptable provided the repeatability criteria and the linearity criteria for the calibration curve described in section 3.2.5.5 can be satisfied. A sample loading system will be required if preconcentration is employed.

3.2.3.4.2 Analytical Column. A high performance ion chromatograph (HPIC) non-metallic column with anion separation characteristics and a high loading capacity designed for separation of metal chelating compounds to prevent metal interference. Resolution described in section 3.2.5.4 must be obtained. A non-metallic guard column with the same ion-exchange material is recommended.

3.2.3.4.3 Preconcentration Column. An HPIC non-metallic column with acceptable anion retention characteristics and sample loading rates as described in section 3.2.5.5.

3.2.3.4.4 0.45 um filter cartridge. For the removal of insoluble material. To be used just prior to sample injection/analysis.

3.2.4 Reagents

All reagents should, at a minimum, conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. All prepared reagents should be checked by IC/PCR analysis for Cr+⁶ to ensure that contamination is below the analytical detection limit for direct injection or, if selected, preconcentration. If total chromium is also to be determined, the reagents should also be checked by the analytical technique selected to ensure that contamination is below the analytical detection limit.

3.2.4.1 Sampling.

3.2.4.1.1 Water. Deionized water. It is recommended that water blanks be checked prior to preparing sampling reagents to ensure that the Cr+⁶ content is less than the analytical detection limit.

3.2.4.1.2 Potassium Hydroxide, 0.1 N. Add 5.6 gm of KOH(s) to approximately 900 ml of DI water and let dissolve. Dilute to 1000 ml with DI water.

Note: At sources with high concentrations of acids and/or SO₂, the concentration of KOH should be increased to 0.5 N to ensure that the pH of the solution is above 8.5 after sampling.

3.2.4.1.3 Silica Gel and Crushed Ice. Same as Method 5, sections 3.1.2 and 3.1.4, respectively.

3.2.4.2 Sample Recovery. The reagents used in sample recovery are as follows:

3.2.4.2.1 Water. Same as subsection 3.2.4.1.1.

3.2.4.2.2 Nitric Acid, 0.1 N. Add 6.3 ml of concentrated HNO₃ (70 percent) to a graduated cylinder containing approximately 900 ml of DI water. Dilute to 1000 ml with DI water, and mix well.

3.2.4.2.3 pH Indicator Strip. pH indicator capable of determining pH of solution between the pH range of 7 and 12, at 0.5 pH intervals.

3.2.4.3 Sample Preparation

3.2.4.3.1 Water. Same as subsection 3.2.4.1.1.

3.2.4.3.2 Nitric Acid, 0.1 N. Same as subsection 3.2.4.2.2.

3.2.4.3.3 Filters. Acetate membrane, or equivalent, filters with 0.45 micrometer or smaller pore size to remove insoluble material.

3.2.4.4 Analysis.

3.2.4.4.1 Chromatographic Eluent. The eluent used in the analytical system is ammonium sulfate based. It is prepared by adding 6.5 ml of 29 percent ammonium hydroxide (NH_4OH) and 33 grams of ammonium sulfate ($(\text{NH}_4)_2\text{SO}_4$) to 500 ml of DI water. The mixture should then be diluted to 1 liter with DI water and mixed well. Other combinations of eluents and/or columns may be employed provided peak resolution, as described in section 3.2.5.4, repeatability and linearity, as described in section 3.2.6.2, and analytical sensitivity are acceptable.

3.2.4.4.2 Post-Column Reagent. An effective post-column reagent for use with the chromatographic eluent described in section 3.2.4.4.1 is a diphenylcarbazide (DPC) based system. Dissolve 0.5 g of 1.5-diphenylcarbazide (DPC) in 100 ml of ACS grade methanol. Add to 500 ml of degassed DI water containing 50 ml of 96 percent spectrophotometric grade sulfuric acid. Dilute to 1 liter with degassed DI water.

3.2.4.4.3 Cr^{+6} Calibration Standard. Prepare Cr^{+6} standards from potassium dichromate ($\text{K}_2\text{Cr}_2\text{O}_7$, FW 294.19). To prepare a 1000 $\mu\text{g}/\text{ml}$ Cr^{+6} stock solution, dissolve 2.829 g of dry $\text{K}_2\text{Cr}_2\text{O}_7$ in 1 liter of DI water. To prepare working standards, dilute the stock solution to the chosen standard concentrations for instrument calibration with 0.05 N KOH to achieve a matrix similar to the actual field samples.

3.2.4.4.4 Performance Audit Sample. A performance audit sample shall be obtained from the Air Quality Laboratory Division of SCDHEC Labs and analyzed with the field samples.

The audit sample should be prepared in a suitable sample matrix at a concentration similar to the actual field samples.

3.2.5 Procedure

Safety First-Wear Safety Glasses at All Times During This Test Method

3.2.5.1 Sampling. The complexity of this method is such that to obtain reliable results, testers should be trained and experienced with test procedures.

3.2.5.1.1 Pretest Preparation. All components shall be maintained and calibrated according to the procedures described in APTD-0576, unless otherwise specified herein.

Rinse all sample train components from the glass nozzle up to the silica gel impinger and sample containers with hot tap water followed by washing with hot soapy water. Next, rinse the train components and sample containers three times with tap water followed by three rinses with DI water. All the components and containers should then be soaked overnight, or a minimum of 4 hours, in a 10 percent (v/v) nitric acid solution, then rinsed three times with DI water. Allow the components to air dry prior to covering all openings with Parafilm, or equivalent.

3.2.5.1.2 Preliminary Determinations. Same as method 5, section 4.1.2.

3.2.5.1.3 Preparation of Sampling Train. Measure 300 ml of 0.1 N KOH into a graduated cylinder (or tare-weighed precleaned polyethylene container). Place approximately 150 ml of the 0.1 N KOH reagent in the first Teflon impinger. Split the rest of the 0.1 N KOH between the second and third Teflon impingers. The next Teflon impinger is left dry. Place a preweighed 200-to 400-g portion of indicating silica gel in the final glass impinger. (For sampling periods in excess of two hours, or for high moisture sites, 400-g of silica gel is recommended.)

Retain reagent blanks of the 0.1 N KOH equal to the volumes used with the field samples.

3.2.5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, section 4.1.4.1 (Pretest Leak-Check), Section 4.1.4.2 (Leak-Checks During the Sample Run), and Section 4.1.4.3 (Post-Test Leak-Checks).

3.2.5.1.5 Sampling Train Operation. Follow the procedures given in method 5, section 4.1.5. The sampling train should be iced down with water and ice to ensure heat transfer with the Teflon impingers.

Note: If the gas to be sampled is above 200 °F, it may be necessary to wrap three or four feet of the Teflon sample and recirculating lines inside the ice bath to keep the recirculated reagent cool enough so it does not turn to steam.

For each run, record the data required on a data sheet such as the one shown in Figure 5.2 of method 5.

At the end of the sampling run, determine the pH of the reagent in the first impinger using a pH indicator strip. The pH of the solution shall be greater than 8.5.

3.2.5.1.6 Calculation of Percent Isokinetic. Same as method 5, section 4.1.6.

3.2.5.2 Post-Test Nitrogen Purge. The nitrogen purge is used as a safeguard against the conversion of hexavalent chromium to the trivalent oxidation state. The purge is effective in the removal of SO₂ from the impinger contents.

Attach the nitrogen purge line to the input of the impinger train. Check to ensure the output of the impinger train is open, and that the recirculating line is capped off. Open the nitrogen gas flow slowly and adjust the delivery rate to 10 L/min. Check the recirculating line to ensure that the pressure is not forcing the impinger reagent out through this line. Continue the purge under these conditions for one-half hour, periodically checking the flow rate.

3.2.5.3 Sample Recovery. Begin cleanup procedures as soon as the train assembly has been purged at the end of the sampling run. The probe assembly may be disconnected from the sample train prior to sample purging.

The probe assembly should be allowed to cool prior to sample recovery. Disconnect the umbilical cord from the sample train. When the probe assembly can be safely handled, wipe off all external particulate matter near the tip of the nozzle, and cap the nozzle prior to transporting the sample train to a cleanup area that is clean and protected from the wind and other potential causes of contamination or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions.

3.2.5.3.1 Container No. 1 (Impingers 1 through 3). Disconnect the first impinger from the second impinger and disconnect the recirculation line from the aspirator or peristaltic pump. Drain the Teflon impingers into a precleaned graduated cylinder or tare-weighted precleaned polyethylene sample container and measure the volume of the liquid to within 1 ml or 1 g. Record the volume of liquid present as this information is required to calculate the moisture content of the flue gas sample. If necessary, transfer the sample from the graduated cylinder to a precleaned polyethylene sample container. With DI water, rinse four times the insides of the glass nozzle, the aspirator, the sample and recirculation lines, the impingers, and the connecting tubing, and combine the rinses with the impinger solution in the sample container.

3.2.5.3.2 Container No. 2 (HNO₃ rinse optional for total chromium). With 0.1 N HNO₃, rinse three times the entire train assembly, from the nozzle to the fourth impinger and combine the rinses into a separate precleaned polyethylene sample container for possible total chromium analysis. Repeat the rinse procedure a final time with DI water, and discard the water rinses. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.3 Container No. 3 (Silica Gel). Note the color of the indicating silica gel to determine if it has been completely spent. Quantitatively transfer the silica gel from its impinger to the original container, and seal the container. A funnel and a rubber policeman may be used to aid in the transfer. The small amount of particulate that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel. Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or the silica gel plus impinger) to the nearest 0.5 g.

3.2.5.3.4 Container No. 4 (0.1 N KOH Blank). Once during each field test, place a volume of reagent equal to the volume placed in the sample train into a precleaned polyethylene

sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.5 Container No. 5 (DI Water Blank). Once during each field test, place a volume of DI water equal to the volume employed to rinse the sample train into a pre-cleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.6 Container No. 6 (0.1 N HNO₃ Blank). Once during each field test if total chromium is to be determined, place a volume of 0.1 N HNO₃ reagent equal to the volume employed to rinse the sample train into a pre-cleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.4 Sample Preparation. For determination of Cr⁺⁶, the sample should be filtered immediately following recovery to remove any insoluble matter. Nitrogen gas may be used as a pressure assist to the filtration process (see Figure Cr⁺⁶-4).

Filter the entire impinger sample through a 0.45-micrometer acetate filter (or equivalent), and collect the filtrate in a 1000-ml graduated cylinder. Rinse the sample container with DI water three separate times, pass these rinses through the filter, and add the rinses to the sample filtrate. Rinse the Teflon reservoir with DI water three separate times, pass these rinses through the filter, and add the rinses to the sample. Determine the final volume of the filtrate and rinses and return them to the rinsed polyethylene sample container. Label the container clearly to identify its contents. Rinse the Teflon reservoir once with 0.1 N HNO₃ and once with DI water and discard these rinses.

If total chromium is to be determined, quantitatively recover the filter and residue and place them in a vial. (The acetate filter may be digested with 5 ml of 70 percent nitric acid; this digestion solution may then be diluted with DI water for total chromium analysis.)

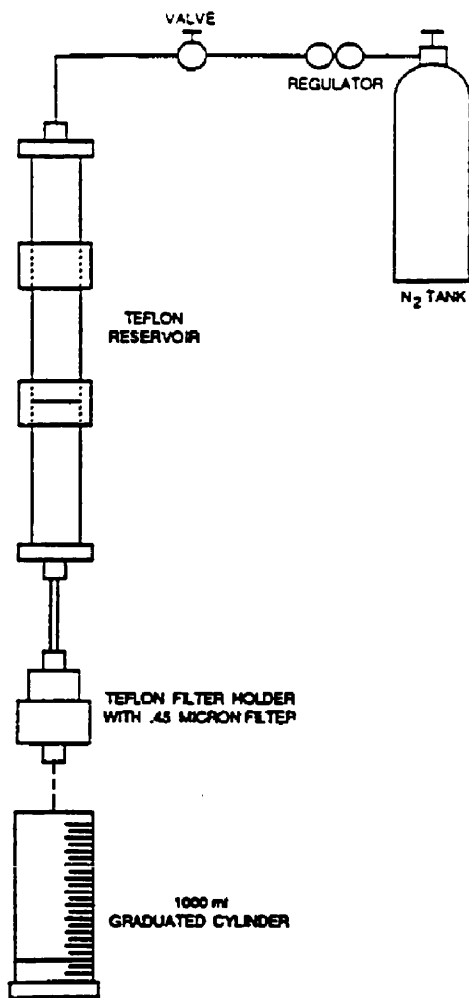


Figure 3.2-4 Schematic of sample filter system.

[Appendix IX]

Note: If the source has a large amount of particulate in the effluent stream, testing teams may wish to filter the sample twice, once through a 2 to 5-micrometer filter, and then through the 0.45-micrometer filter.

3.2.5.4.1 Container 2 (HNO₃ rinse, optional for total chromium). This sample shall be analyzed in accordance with the selected procedure for total chromium analysis. At a minimum, the sample should be subjected to a digestion procedure sufficient to solubilize all chromium present.

3.2.5.4.2 Container 3 (Silica Gel). Weigh the spent silica gel to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

3.2.5.5 Sample analysis. The Cr+⁶ content of the sample filtrate is determined by ion chromatography coupled with a post-column reactor (IC/PCR). To increase sensitivity for trace levels of chromium, a preconcentration system is also used in conjunction with the IC/PCR.

Prior to preconcentration and/or analysis, all field samples will be filtered through a 0.45- μ filter. This filtration should be conducted just prior to sample injection/analysis.

The preconcentration is accomplished by selectively retaining the analyte on a solid absorbent (as described in 3.2.3.4.3), followed by removal of the analyte from the absorbent. The sample is injected into a sample loop of the desired size (repeated loadings or larger size loop for greater sensitivity) and the Cr+⁶ is collected on the resin bed of the column. When the injection valve is switched, the eluent displaces the concentrated Cr+⁶ sample moving it off the preconcentration column and onto the IC anion separation column. After separation from other sample components, Cr+⁶ forms a specific complex in the post-column reactor with a diphenylcarbazide reaction solution, and the complex is then detected by visible absorbance at a wavelength of 520 nm. The amount of absorbance measured is proportional to the concentration of the Cr+⁶ complex formed. The IC retention time and absorbance of the Cr+⁶ complex is compared with known Cr+⁶ standards analyzed under identical conditions to provide both qualitative and quantitative analyses.

Prior to sample analysis, establish a stable baseline with the detector set at the required attenuation by setting the eluent flowrate at approximately 1 ml/min and post-column reagent flowrate at approximately 0.5 ml/min.

Note: As long as the ratio of eluent flowrate to PCR flowrate remains constant, the standard curve should remain linear. Inject a sample of DI water to ensure that no Cr+⁶ appears in the water blank.

First, inject the calibration standards prepared, as described in section 3.2.4.4.4, to cover the appropriate concentration range, starting with the lowest standard first. Next, inject, in duplicate, the performance audit sample, followed by the 0.1 N KOH field blank and the field samples. Finally, repeat the injection of the calibration standards to allow for compensation of instrument drift. Measure areas or heights of the Cr+⁶/DPC complex chromatogram peak. The response for replicate, consecutive injections of samples must be within 5 percent of the average response, or the injection should be repeated until the 5 percent criterion can be met. Use the average response (peak areas or heights) from the duplicate injections of calibration standards to generate a linear calibration curve. From the calibration curve, determine the concentration of the field samples employing the average response from the duplicate injections.

The results for the analysis of the performance audit sample must be within 10 percent of the reference value for the field sample analysis to be valid.

3.2.6 Calibration. Maintain a written log of all calibration activities.

3.2.6.1 Sample Train Calibration. Calibrate the sample train components according to the indicated sections of method 5: Probe Nozzle (section 5.1); Pitot Tube (section 5.2); Metering System (section 5.3); Temperature Gauges (section 5.5); Leak-Check of the Metering System (section 5.6); and Barometer (section 5.7).

3.2.6.2 Calibration Curve for the IC/PCR. Prepare working standards from the stock solution described in section 3.2.4.4.4 by dilution with a DI water solution to approximate the field sample matrix. Prepare at least four standards to cover one order of magnitude that bracket the field sample concentrations. Run the standards with the field samples as described in section 3.2.5.5. For each standard, determine the peak areas (recommended) or the peak heights, calculate the average response from the duplicate injections, and plot the average response against the Cr+⁶ concentration in $\mu\text{g/L}$. The individual responses for each calibration standard determined before and after field sample analysis must be within 5 percent of the average response for the analysis to be valid. If the 5 percent criteria is exceeded, excessive drift and/or instrument degradation may have occurred, and must be corrected before further analyses are performed.

Employing linear regression, calculate a predicted value for each calibration standard with the average response for the duplicate injections. Each predicted value must be within 7 percent of the

actual value for the calibration curve to be considered acceptable. If not acceptable, remake and/or rerun the calibration standards. If the calibration curve is still unacceptable reduce the range of the curve.

3.2.7 Calculations

3.2.7.1 Dry Gas Volume. Using the data from the test, calculate $V_{M(STD)}$, the dry gas sample volume at standard conditions as outlined in Section 6.3 of Method 5.

3.2.7.2 Volume of Water Vapor and Moisture Content. Using the data from the test, calculate $V_w(std)$ and B_{ws} , the volume of water vapor and the moisture content of the stack gas, respectively, using Equations 5-2 and 5-3 of Method 5.

3.2.7.3 Stack Gas Velocity. Using the data from the test and Equation 2-9 of Method 2, calculate the average stack gas velocity.

3.2.7.4 Total $ug\ Cr + ^6$ per Sample. Calculate as described below:

$$m = (S - B) \times V_{IS} \times d$$

where:

m = Mass of $Cr + ^6$ in the sample, ug .

S = Concentration of sample, $ug\ Cr + ^6/ml$.

B = Concentration of blank, $ug\ Cr + ^6/ml$.

V_{IS} = Volume of sample after filtration, ml.

d = Dilution factor (1 if not diluted).

3.3 Measurement of HCl and Cl_2

3.3.1 Isokinetic HCl/ Cl_2 Emission Sampling Train (Method 0050)

3.3.1.1 Scope and Application.

3.3.1.1.1 This method describes the collection of hydrogen chloride (HCl, CAS Registry Number 7647-01-0) and chlorine (Cl_2 , CAS Registry Number 7782-50-5) in stack gas emission samples from hazardous waste incinerators' municipal waste combustors, and boilers and industrial furnaces. The collected samples are analyzed using Method 9057. This method collects the emission sample isokinetically and is therefore particularly suited for sampling at sources, such as those controlled by wet scrubbers, emitting acid particulate matter (e.g., HCl dissolved in water droplets). A midjet impinger train sampling method designed for sampling sources of HCl/ Cl_2 emissions not in particulate form is presented in method 0051.

3.3.1.1.2 This method is not acceptable for demonstrating compliance with HCl emission standards less than 20 ppm.

3.3.1.1.3 This method may also be used to collect samples for subsequent determination of particulate emissions (by EPA method 5, reference 1) following the additional sampling procedures described.

3.3.1.2 Summary of Method.

3.3.1.2.1 Gaseous and particulate pollutants are withdrawn from an emission source and are collected in an optional cyclone, on a filter, and in absorbing solutions. The cyclone collects any liquid droplets and is not necessary if the source emissions do not contain liquid droplets. The Teflon mat or quartz-fiber filter collects other particulate matter including chloride salts. Acidic and alkaline absorbing solutions collect gaseous HCl and Cl_2 , respectively. Following sampling of emissions containing liquid droplets, any HCl/ Cl_2 dissolved in the liquid in the cyclone and/or on the filter is vaporized and ultimately collected in the impingers by pulling Ascarite IIR conditioned ambient air through the sampling train. In the acidified water absorbing solution, the HCl gas is solubilized and forms chloride (Cl^-) ions. The Cl_2 gas present in the emissions has a very low solubility in acidified water and passes through to the alkaline absorbing solution where it undergoes hydrolysis to form a proton (H^+), Cl^- , and hypochlorous acid (HClO). The Cl^- ions in the separate solutions are measured by ion chromatography (method 9057). If desired, the particulate matter recovered from the filter and the probe is analyzed following the procedures in EPA Method 5 (reference 1).

3.3.1.3 Interferences.

3.3.1.3.1 Volatile materials which produce chloride ions upon dissolution during sampling are obvious interferences in the measurement of HCl. One interferant for HCl is diatomic chlorine (Cl_2) gas which disproportionates to HCl and hypochlorous acid (HClO) upon dissolution in water. Cl_2 gas exhibits a low solubility in water, however, and the use of acidic rather than neutral or basic solutions for collection of hydrogen chloride gas greatly reduces the dissolution of any chlorine present.

3.3.1.4 Apparatus and Materials.

3.3.1.4.1 Sampling Train.

3.3.1.4.1.1 A schematic of the sampling train used in this method is shown in Figure 3.3-1. This sampling train configuration is adapted from EPA method 5 procedures, and, as such, the majority of the required equipment is identical to that used in EPA Method 5 determinations. The new components required are a glass nozzle and probe, a Teflon union, a quartz-fiber or Teflon mat filter (see section 3.3.1.5.5), a Teflon frit, and acidic and alkaline absorbing solutions.

3.3.1.4.1.2 Construction details for the basic train components are provided in section 3.4 of EPA's Quality Assurance Handbook, Volume III (reference 2); commercial models of this equipment are also available.

Additionally, the following subsections identify allowable train configuration modifications.

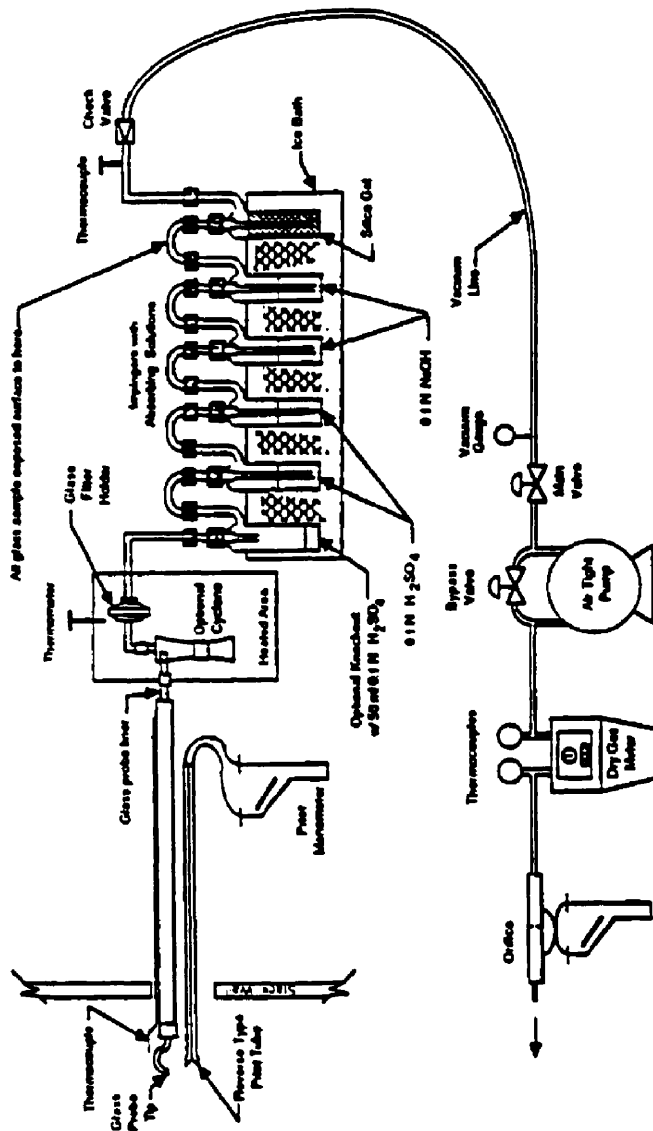


Figure 3.3-1 Isokinetic HCl/Cl₂ Sampling Train

[Appendix IX]

3.3.1.4.1.3 Basic operating and maintenance procedures for the sampling train are also described in Reference 2. As correct usage is important in obtaining valid results, all users should refer to Reference 2 and adopt the operating and maintenance procedures outlined therein unless otherwise specified. The sampling train consists of the components detailed below.

3.3.1.4.1.3.1 Probe nozzle. Glass with sharp, tapered (30° angle) leading edge. The taper shall be on the outside to preserve a constant I.D. The nozzle shall be buttonhook or elbow design. The nozzle should be coupled to the probe liner using a Teflon union. It is recommended that a stainless steel nut be used on this union. In cases where the stack temperature exceeds 210 °C (410 °F), a one-piece glass nozzle/liner assembly must be used. A range of nozzle sizes suitable for isokinetic sampling should be available. Each nozzle shall

be calibrated according to the procedures outlined in EPA Method 5 (see References 1 and 2).

3.3.1.4.1.3.2 Probe liner. Borosilicate or quartz-glass tubing with a heated system capable of maintaining a gas temperature of 120 ± 14 °C (248 ± 25 °F) at the exit end during sampling. Because the actual temperature at the outlet of the probe is not usually monitored during sampling, probes constructed and calibrated according to the procedure in Reference 2 are considered acceptable. Either borosilicate or quartz-glass probe liners may be used for stack temperatures up to about 480 °C (900 °F). Quartz liners shall be used for temperatures between 480 and 900 °C (900 and 1650 °F). (The softening temperature for borosilicate is 820 °C (1508 °F), and for quartz is 1500 °C (2732 °F).) Water-cooling of the stainless steel sheath will be necessary at temperatures approaching and exceeding 500 °C.

3.3.1.4.1.3.3 Pitot tube. Type S, as described in section 2.1 of EPA Method 2 (Reference 1). The pitot tube shall be attached to the probe to allow constant monitoring of the stack-gas velocity. The impact (high-pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see section 3.1.1 of Reference 2) during sampling. The Type S pitot tube assembly shall have a known coefficient, determined as outlined in section 3.1.1 of Reference 2.

3.3.1.4.1.3.4 Differential pressure gauge. Inclined manometer or equivalent device as described in section 2.2 of EPA method 2 (Reference 1). One manometer shall be used for velocity-head (ΔP) readings and the other for orifice differential pressure (ΔH) readings.

3.3.1.4.1.3.5 Cyclone (optional). Glass.

3.3.1.4.1.3.6 Filter holder. Borosilicate glass, with a Teflon frit filter support and a sealing gasket. The sealing gasket shall be constructed of Teflon or equivalent materials. The holder design shall provide a positive seal against leakage at any point along the filter circumference. The holder shall be attached immediately to the outlet of the cyclone.

3.3.1.4.1.3.7 Filter heating system. Any heating system capable of maintaining a temperature of 120 ± 14 °C (248 ± 25 °F) around the filter and cyclone during sampling. A temperature gauge capable of measuring temperature to within 3 °C (5.4 °F) shall be installed so that the temperature around the filter holder can be regulated and monitored during sampling.

3.3.1.4.1.3.8 Impinger train. The following system shall be used to determine the stack gas moisture content and to collect HCl and Cl₂: five or six impingers connected in series with leak-free ground glass fittings or any similar leak-free non-contaminating fittings. The first impinger shown in Figure 1 (knockout or condensate impinger) is optional and is recommended as a water knockout trap for use under test conditions which require such a trap. If used, this impinger should be constructed as described below for the alkaline impingers, but with a shortened stem, and should contain 50 ml of 0.1 N H₂SO₄. The following two impingers (acid impingers which each contain 100 ml of 0.1 N H₂SO₄) shall be of the Greenburg-Smith design with the standard tip (see method 5, paragraph 2.1.7). The next two impingers (alkaline impingers which each contain 100 ml of 0.1 N NaOH) and the last impinger (containing silica gel) shall be of the Greenburg-Smith design modified by replacing the tip with a 1.3-cm (1/2-in) I.D. glass tube extending about 1.3 cm (1/2 in) from the bottom of the impinger (see method 5, paragraph 2.1.7). The condensate, acid, and alkaline impingers shall contain known quantities of the appropriate absorbing reagents. The last impinger shall contain a known weight of silica gel or equivalent desiccant.

3.3.1.4.1.3.9 Metering system. The necessary components are a vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 3 °C (5.4 °F), dry-gas meter capable of measuring volume to within 1 percent, an orifice meter, (rate meter), and related equipment, as shown in Figure 1. At a minimum, the pump should be capable of 4 cfm free flow, and the dry-gas meter should have a recording capacity of 0-999.9 cu ft with a resolution of 0.005 cu ft. Other metering systems capable of maintaining sampling rates within 10 percent of isokineticity and of determining sample volumes to within 2 percent

may be used. The metering system should be used in conjunction with a pitot tube to enable checks of isokinetic sampling rates.

3.3.1.4.1.3.10 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby National Weather Service station, in which case the station value (which is the absolute barometric pressure) is requested and an adjustment for elevation differences between the weather station and sampling point is applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 300-m (100 ft) elevation increase (vice versa for elevation decrease).

3.3.1.4.1.3.11 Gas density determination equipment. Temperature sensor and pressure gauge (as described in sections 2.3 and 2.4 of EPA method 2), and gas analyzer, if necessary (as described in EPA method 3, Reference 1). The temperature sensor ideally should be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal. Alternatively, the sensor may be attached just prior to use in the field. Note, however, that if the temperature sensor is attached in the field, the sensor must be placed in an interference-free arrangement with respect to the Type S pitot tube openings (see EPA method 2, Figure 2-7). As a second alternative, if the stack gas is saturated, the stack temperature may be measured at a single point near the center of the stack.

3.3.1.4.1.3.12 Ascarite tube for conditioning ambient air. Tube tightly packed with approximately 150 g of fresh 8 to 20 mesh Ascarite II● sodium hydroxide coated silica, or equivalent, to dry and remove acid gases from the ambient air used to remove moisture from the filter and optional cyclone. The inlet and outlet ends of the tube should be packed with at least 1 cm thickness of glass wool or filter material suitable to prevent escape of Ascarite II fines. Fit one end with flexible tubing, etc. to allow connection to probe nozzle.

3.3.1.4.2 Sample Recovery.

3.3.1.4.2.1 Probe liner. Probe and nozzle brushes; nylon bristle brushes with stainless steel wire handles are required. The probe brush shall have extensions of stainless steel, Teflon, or inert material at least as long as the probe. The brushes shall be properly sized and shaped to brush out the probe liner and the probe nozzle.

3.3.1.4.2.2 Wash bottles. Two. Polyethylene or glass, 500 ml or larger.

3.3.1.4.2.3 Glass sample storage containers. Glass, 500- or 1000-ml. Screw-cap liners shall be Teflon and constructed so as to be leak-free. Narrow-mouth glass bottles have been found to exhibit less tendency toward leakage.

3.3.1.4.2.4 Petri dishes. Glass or plastic, sealed around the circumference with Teflon tape, for storage and transport of filter samples.

3.3.1.4.2.5 Graduated cylinder and/or balances. To measure condensed water to the nearest 1 ml or 1 g. Graduated cylinders shall have subdivisions not \geq ml. Laboratory triple-beam balances capable of weighing to \pm 0.5 g or better are required.

3.3.1.4.2.6 Plastic storage containers. Screw-cap polypropylene or polyethylene containers to store silica gel.

3.3.1.4.2.7 Funnel and rubber policeman. To aid in transfer of silica gel to container (not necessary if silica gel is weighed in field).

3.3.1.4.2.8 Funnels. Glass, to aid in sample recovery.

3.3.1.5 Reagents

3.3.1.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently higher purity to permit its use without lessening the accuracy of the determination.

3.3.1.5.2 ASTM Type II water (ASTM D1193-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified. It is advisable to analyze a blank

sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.1.5.3 Sulfuric acid (0.1 N), H₂SO₄. Used as the HCl absorbing reagent in the impinger train. To prepare 1 L, slowly add 2.80 ml of concentrated H₂SO₄ to about 900 ml of water while stirring, and adjust the final volume to 1 L using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.1.5.4 Sodium hydroxide (0.1 N). NaOH. Used as the Cl₂ absorbing reagent in the impinger train. To prepare 1 L, dissolve 4.00 g of solid NaOH in about 900 ml of water and adjust the final volume of 1 L using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see Method 9057).

3.3.1.5.5 Filter. Quartz-fiber or Teflon mat (e.g., Pallflex●TX40HI45) filter.

3.3.1.5.6 Silica gel. Indicating type, 6-16 mesh. If previously used, dry at 175 °C (350 °F) for 2 hours before using. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to the approval of the Administrator.

3.3.1.5.7 Acetone. When using this train for determination of particulate emissions, reagent grade acetone, <0.001 percent residue, in glass bottles is required. Acetone from metal containers generally has a high residue blank and should not be used. Sometimes suppliers transfer acetone to glass bottles from metal containers; thus, acetone blanks shall be run prior to field use and only acetone with low blank values (<0.001 percent) shall be used. In no case shall a blank value greater than 0.001 percent of the weight of acetone used be subtracted from the sample weight.

3.3.1.5.8 Crushed ice. Quantities ranging from 10–50 lbs may be necessary during a sampling run, depending on ambient air temperature.

3.3.1.5.9 Stopcock grease. Acetone-insoluble, heat-stable silicone grease may be used, if needed. Silicone grease usage is not necessary if screw-on connectors or Teflon sleeves on ground-glass joints are used.

3.3.1.6 Sample Collection, Preservation, and Handling.

3.3.1.6.1 Sample collection is described in this method. The analytical procedures for HCl and Cl₂ are described in method 9057 and for particulate matter in EPA method 5 (Reference 1).

3.3.1.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.1.7 Procedure.

3.3.1.7.1 Preparation for Field Test.

3.3.1.7.1.1 All sampling equipment shall be maintained and calibrated according to the procedures described in section 3.4.2 of EPA's Quality Assurance Handbook, Volume III (Reference 2).

3.3.1.7.1.2 Weigh several 200- to 300-g portions of silica gel in airtight containers to the nearest 0.5 g. Record on each container the total weight of the silica gel plus containers. As an alternative to preweighing the silica gel, it may instead be weighed directly in the impinger just prior to train assembly.

3.3.1.7.1.3 Check filters visually against light for irregularities and flaws or pinhole leaks. Label the shipping containers (glass or plastic Petri dishes) and keep the filters in these containers at all times except during sampling (and weighing for particulate analysis).

3.3.1.7.1.4 If a particulate determination will be conducted, desiccate the filters at 20 ± 5.6°C (68 ± 10°F) and ambient pressure for at least 24 hours, and weigh at intervals of at least 6 hours to a constant weight (i.e., <0.5-mg change from previous weighing), recording results to the nearest 0.1 mg. During each weighing, the filter must not be exposed for more than a

2-min period to the laboratory atmosphere and relative humidity above 50 percent. Alternatively (unless otherwise specified by the Administrator), the filters may be oven-dried at 105°C (220°F) for 2-3 hours, desiccated for 2 hours, and weighed.

3.3.1.7.2 Preliminary Field Determinations.

3.3.1.7.2.1 Select the sampling site and the minimum number of sampling points according to EPA method 1 or as specified by the Department. Determine the stack pressure, temperature, and range of velocity heads using EPA method 2. It is recommended that a leak-check of the pitot lines (see EPA method 2, section 3.1) be performed. Determine the stack-gas moisture content using EPA method 4 or its alternatives to establish estimates of isokinetic sampling rate settings. Determine the stack gas dry molecular weight, as described in EPA method 2, section 3.6. if integrated EPA method 3 (Reference 1) sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as the sample run.

3.3.1.7.2.2 Select a nozzle size based on the range of velocity heads so that it is not necessary to change the nozzle size to maintain isokinetic sampling rates. During the run, do not change the nozzle. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see section 2.2 of EPA method 2).

3.3.1.7.2.3 Select a suitable probe liner and probe length so that all traverse points can be sampled. For large stacks, to reduce the length of the probe, consider sampling from opposite sides of the stack.

3.3.1.7.2.4 The total sampling time should be two hours. Allocate the same time to all traverse points defined by EPA method 1. To avoid timekeeping errors, the length of time sampled at each traverse point should be an integer or an integer plus one-half min. Size the condensate impinger for the expected moisture catch or be prepared to empty it during the run.

3.3.1.7.3 Preparation of Sampling Train.

3.3.1.7.3.1 Add 50 ml of 0.1 N H₂SO₄ to the condensate impinger, if used. Place 100 ml of 0.1 N H₂SO₄ in each of the next two impingers. Place 100 ml of 0.1 N NaOH in each of the following two impingers. Finally, transfer approximately 200-300 g of preweighed silica gel from its container to the last impinger. More silica gel may be used, but care should be taken to ensure that it is not entrained and carried out from the impinger during sampling. Place the silica gel container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

3.3.1.7.3.2 Using a tweezer or clean disposable surgical gloves, place a labeled (identified) filter (weighed, if particulate matter to be determined) in the filter holder. Be sure that the filter is properly centered and the gasket properly placed to prevent the sample gas stream from circumventing the filter. Check the filter for tears after assembly is completed.

3.3.1.7.3.3 To use glass liners, install the selected nozzle using a Viton-A O-ring when stack temperatures are 260°C (500°F) and a woven glass-fiber gasket when temperatures are higher. Other connecting systems utilizing either 316 stainless steel or Teflon ferrules may be used. Mark the probe with heat-resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

3.3.1.7.3.4 Set up the train as in Figure 3.3-1. A minimal amount of silicone grease may be used on ground glass joints. Connect temperature sensors to the appropriate potentiometer/display unit. Check all temperature sensors at ambient temperature.

3.3.1.7.3.5 Place crushed ice around the impingers.

3.3.1.7.3.6 Turn on and set the filter and probe heating systems at the desired operating temperatures. Allow time for the temperatures to stabilize.

3.3.1.7.4 Leak-Check Procedures.

3.3.1.7.4.1 Pretest leak-check. A pretest leak-check is recommended, but not required. If the tester opts to conduct the pretest leak-check, the following procedure shall be used.

3.3.1.7.4.1.1 If a Viton-A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak-check the train at the sampling site by plugging the nozzle and pulling a 380-mm Hg (15-in. Hg) vacuum.

Note: A lower vacuum may be used, provided that it is not exceeded during the test.

3.3.1.7.4.1.2 If a woven glass-fiber gasket is used, do not connect the probe to the train during the leak-check. Instead, leak-check the train by first plugging the inlet to the cyclone, if used, or the filter holder and pulling a 380-mm Hg (15-in. Hg) vacuum (see Note above). Then, connect the probe to the train and leak-check at about 25-mm Hg (1-in. Hg) vacuum; alternatively, leak-check the probe with the rest of the sampling train in one step at 380-mm Hg (15-in. Hg) vacuum. Leakage rates in excess of 4 percent of the average sampling rate or 0.00057 m³/min (0.02 cfm), whichever is less, are unacceptable.

3.3.1.7.4.1.3 The following leak-check instructions for the sampling train may be helpful. Start the pump with bypass valve fully open and coarse adjust valve completely closed. Partially open the coarse adjust valve and slowly close the bypass valve until the desired vacuum is reached. Do not reverse direction of the bypass valve; this will cause water to back up into the filter holder. If the desired volume is exceeded, either leak-check at this higher vacuum or end the leak-check, as shown below, and start over.

3.3.1.7.4.1.4 When the leak-check is completed, first slowly remove the plug from the inlet to the probe, cyclone, or filter holder and immediately turn off the vacuum pump. This prevents the liquid in the impingers from being forced backward into the filter holder and silica gel from being entrained backward into the fifth impinger.

3.3.1.7.4.2 Leak-checks during sample run. If during the sampling run, a component (e.g., filter assembly or impinger) change becomes necessary or a port change is conducted, a leak-check shall be conducted immediately after the interruption of sampling and before the change is made. The leak-check shall be conducted according to the procedure outlined in Section 3.3.1.7.4.1, except that it shall be conducted at a vacuum greater than or equal to the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00057 m³/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester shall void the sampling run. Immediately after a component change or port change, and before sampling is reinitiated, another leak-check similar to a pre-test leak-check is recommended.

3.3.1.7.4.3 Post-test leak-check. A leak-check is mandatory at the conclusion of each sampling run. The leak-check shall be done using the same procedures as those with the pre-test leak-check, except that it shall be conducted at a vacuum greater than or equal to the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00057 m³/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester shall void the sampling run.

3.3.1.7.5 Train Operation.

3.3.1.7.5.1 During the sampling run, maintain an isokinetic sampling rate to within 10 percent of true isokinetic, unless otherwise specified by the Department. Maintain a temperature around the filter (and cyclone, if used) of 120 ± 14°C (248 ± 25°F).

3.3.1.7.5.2 For each run, record the data required on a data sheet such as the one shown in Figure 3.3-2. Be sure to record the initial dry gas meter reading. Record the dry gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made before and after each leak-check, and when sampling is halted. Take other readings required by Figure 3.3-2 at least once at each sample point during each time increment and additional readings when significant changes (20 percent variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.

3.3.1.7.5.3 Clean the stack access ports prior to the test run to eliminate the chance of sampling deposited material. To begin sampling, remove the nozzle cap, verify that the filter

and probe heating systems are at the specified temperature, and verify that the pitot tube and probe are positioned properly. Position the nozzle at the first traverse point, with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions using a calculator or a nomograph. Nomographs are designed for use when the Type S pitot tube coefficient is 0.84 ± 0.02 and the stack gas equivalent density (dry molecular weight) is equal to 29 ± 4 . If the stack gas molecular weight and the pitot tube coefficient are outside the above ranges, do not use the nomographs unless appropriate steps are taken to compensate for the deviations (see Reference 3).

3.3.1.7.5.4 When the stack is under significant negative pressure (equivalent to the height of the impinger stem), take care to close the coarse adjust valve before inserting the probe into the stack, to prevent water from backing into the filter holder. If necessary, the pump may be turned on with the coarse adjust valve closed.

3.3.1.7.5.5 When the probe is in position, block off the openings around the probe and stack access port to prevent unrepresentative dilution of the gas stream.

3.3.1.7.5.7 During the test run, make periodic adjustments to keep the temperature around the filter holder (and cyclone, if used) at the proper level. Add more ice, and, if necessary, salt to maintain a temperature of $<20\text{ }^{\circ}\text{C}$ ($68\text{ }^{\circ}\text{F}$) at the condenser/silica gel outlet. Also, periodically check the level and zero of the manometer.

3.3.1.7.5.8 If the pressure drop across the filter becomes too high, making isokinetic sampling difficult to maintain, it may be replaced in the midst of a sample run. Using another complete filter holder assembly is recommended, rather than attempting to change the filter itself. After a new filter assembly is installed, conduct a leak-check. If determined, the total particulate weight shall include the summation of all filter assembly catches.

3.3.1.7.5.9 If the condensate impinger becomes too full, it may be emptied, recharged with 50 ml of 0.1 N H_2SO_4 , and replaced during the sample run. The condensate emptied must be saved and included in the measurement of the volume of moisture collected and included in the sample for analysis. The additional 50 ml of absorbing reagent must also be considered in calculating the moisture. After the impinger is reinstalled in the train, conduct a leak check.

3.3.1.7.5.10 A single train shall be used for the entire sample run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or in cases where equipment failure necessitates a change of trains. In all other situations, the use of two or more trains will be subject to the approval of the Department.

3.3.1.7.5.11 Note that when two or more trains are used, separate analyses of the particulate catch (if applicable) and the HCl and Cl_2 impinger catches from each train shall be performed, unless identical nozzle sizes were used on all trains. In that case, the particulate catch and the HCl and Cl_2 impinger catches from the individual trains may be combined, and a single particulate analysis and single HCl and Cl_2 analyses of the impinger contents may be performed.

3.3.1.7.5.12 At the end of the sample run, turn off the coarse adjust valve, remove the probe and nozzle from the stack, turn off the pump, and record the final dry gas meter reading.

3.3.1.7.5.13 If there is any possibility that liquid has collected in the glass cyclone and/or on the filter, connect the Ascarite tube at the probe inlet and operate the train with the filter heating system at $120 \pm 14\text{ }^{\circ}\text{C}$ ($248 \pm 25\text{ }^{\circ}\text{F}$) at a low flow rate (e.g., $\text{H}=1$) sufficient to vaporize the liquid and any HCl in the cyclone or on the filter and pull it through the train into the impingers. After 30 minutes, turn off the flow, remove the Ascarite tube, and examine the cyclone and filter for any visible moisture. If moisture is visible, repeat this step for 15 minutes.

3.3.1.7.5.14 Conduct a post-test leak check. Also, leak-check the pitot lines as described in EPA method 2. The lines must pass this leak-check in order to validate the velocity-head data.

3.3.1.7.5.15 If the moisture value is available, calculate percent isokineticity (see section 3.3.1.7.7.10) to determine whether the run was valid or another test run should be conducted.

3.3.1.7.6 Sample Recovery.

3.3.1.7.6.1 Allow the probe to cool. When the probe can be handled safely, wipe off all the external surfaces of the tip of the probe nozzle and place a cap over the tip. Do not cap the probe tip tightly while the sampling train is cooling down because this will create a vacuum in the filter holder, drawing water from the impingers into the holder.

3.3.1.7.6.2 Before moving the sampling train to the cleanup site, remove the probe, wipe off any silicone grease, and cap the open outlet, being careful not to lose any condensate that might be present. Wipe off any silicone grease and cap the filter or cyclone inlet. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger and the filter holder, disconnect it at the filter holder and let any condensed water drain into the first impinger. Wipe off any silicone grease and cap the filter holder outlet and the impinger inlet. Ground glass stoppers, plastic caps, serum caps, Teflon tape, Parafilm●, or aluminum foil may be used to close these openings.

3.3.1.7.6.3 Transfer the probe and filter/impinger assembly to the cleanup area. This area should be clean and protected from the weather to minimize sample contamination or loss.

3.3.1.7.6.4 Save portions of all washing solutions used for cleanup (acetone and Type II water) and the absorbing reagents (0.1 N H₂SO₄ and 0.1 N NaOH) as blanks. Transfer 200 ml of each solution directly from the wash bottle being used (rinse solutions) or the supply container (absorbing reagents) and place each in a separate, pre-labeled glass sample container.

3.3.1.7.6.5 Inspect the train prior to and during disassembly and note any abnormal conditions.

3.3.1.7.6.6 Container No. 1 (filter catch for particulate determination). Carefully remove the filter from the filter holder and place it in its identified Petri dish container. Use one or more pair of tweezers to handle the filter. If it is necessary to fold the filter, ensure that the particulate cake is inside the fold. Carefully transfer to the Petri dish any particulate matter or filter fibers that adhere to the filter holder gasket, using a dry nylon bristle brush or sharp-edged blade, or both. Label the container and seal with Teflon tape around the circumference of the lid.

3.3.1.7.6.7 Container No. 2 (front-half rinse for particulate determination). Taking care that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter or any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components with acetone into a glass container. Retain an acetone blank and analyze with the samples.

3.3.1.7.6.8 Perform rinses as follows: Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nylon bristle brush. Brush until the rinse shows no visible particles; then make a final rinse of the inside surface with the acetone. Brush and rinse the inside parts of the Swagelok fitting with the acetone in a similar way until no visible particles remain.

3.3.1.7.6.9 Have two people rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with solvent. Let the acetone drain from the lower end into the sample container. A glass funnel may be used to aid in transferring liquid washed to the container.

3.3.1.7.6.10 Follow the acetone rinse with a probe brush. Hold the probe in an inclined position and squirt acetone into the upper end while pushing the probe brush through the probe with a twisting action; place a sample container underneath the lower end of the probe and catch any acetone and particulate matter that is brushed from the probe. Run the brush through the probe three or more times until no visible particulate matter is carried out with the acetone or until none remains in the probe liner on visual inspection. Rinse the brush with acetone and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above. Between sampling runs, keep brushes clean and protected from contamination.

3.3.1.7.6.11 Clean the inside of the front half of the filter holder and cyclone by rubbing the surfaces with a nylon bristle brush and rinsing with acetone. Rinse each surface three times, or more if needed, to remove visible particulate. Make a final rinse of the brush and filter holder. Carefully rinse out the glass cyclone and cyclone flask (if applicable). Brush and rinse any particulate material adhering to the inner surfaces of these components into the front-half rinse sample. After all rinses and particulate matter have been collected in the sample container, tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to identify its contents.

3.3.1.7.6.12 Container No. 3 (knockout and acid impinger catch for moisture and HCl determination). Disconnect the impingers. Measure the liquid in the acid and knockout impingers to within ± 1 ml by using a graduated cylinder or by weighing it to within ± 0.5 g by using a balance (if one is available). Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these impingers, connecting

glassware (and tubing, if used); and the back half of the filter holder with water and add these rinses to the storage container. Seal the container, shake to mix, and label. The fluid level should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Retain rinse water and acidic absorbing solution blanks and analyze with the samples.

3.3.1.7.6.13 Container No. 4 (alkaline impinger catch for Cl_2 and moisture determination). Measure and record the liquid in the alkaline impingers as described in section 3.3.1.7.6.12. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these two impingers and connecting glassware with water and add these rinses to the container. Seal the container, shake to mix, and label; mark the fluid level. Retain alkaline absorbing solution blank and analyze with the samples.

3.3.1.7.6.14 Container No. 5 (silica gel for moisture determination). Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the last impinger to its original container and seal. A funnel may make it easier to pour the silica gel without spilling. A rubber policeman may be used as an aid in removing the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere strongly to the impinger wall. Because the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, weigh the container and its contents to 0.5 g or better.

3.3.1.7.6.15 Prior to shipment, recheck all sample containers to ensure that the caps are well secured. Seal the lids of all containers around the circumference with Teflon tape. Ship all liquid samples upright and all particulate filters with the particulate catch facing upward.

3.3.1.7.7 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.1.7.7.1 Nomenclature.

A_n	Cross-sectional area of nozzle, m^2 (ft^2).
B_{ws}	Water vapor in the gas stream, proportion by volume.
C_a	Acetone blank residue concentration, mg/mg.
C_d	Type S pitot tube coefficient (nominally 0.84 ± 0.02), dimensionless.
C_s	Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, g/dscm (g/dscf).
I	Percent of isokinetic sampling.
m_a	Mass of residue of acetone after evaporation, mg.
M_n	Total amount of particulate matter collected, mg.
M_d	Stack-gas dry molecular weight, g/g-mole (lb/lb-mole).
M_w	Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).
P_{bar}	Barometric pressure at the sampling site, mm Hg (in. Hg).
P_s	Absolute stack-gas pressure, mm Hg (in. Hg).
P_{std}	Standard absolute pressure, 760 mm Hg (29.92 in. Hg).
R	Ideal gas constant, $0.06236 \text{ mm Hg-m}^3$ (k-g-mole ($21.85 \text{ in. Hg-ft}^3/\text{°R-lb-mole}$)).
T_m	Absolute average dry-gas meter temperature (see Figure 2), $^{\circ}\text{K}$ ($^{\circ}\text{R}$).
T_s	Absolute average stack-gas temperature (see Figure 2), $^{\circ}\text{K}$ ($^{\circ}\text{R}$).
T_{std}	Standard absolute temperature, $293 \text{ }^{\circ}\text{K}$ ($528 \text{ }^{\circ}\text{R}$).
V_{ic}	Total volume of liquid collected in the impingers and silica gel, ml.
V_m	Volume of gas sample as measured by dry-gas meter, dscm (dscf).
$V_{m(\text{std})}$	Volume of gas sample measured by the dry-gas meter, corrected to standard conditions, dscm (dscf).
$V_{w(\text{std})}$	Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).
V_s	Stack-gas velocity, calculated by Method 2, Equation 2-9, using data obtained from Method 5, m/sec (ft/sec).
W_a	Weight of residue in acetone wash, mg.
V_a	Volume of acetone blank, ml.
V_{aw}	Volume of acetone used in wash; ml.
Y	Dry-gas-meter calibration factor, dimensionless.
ΔH	Average pressure differential across the orifice meter, mm H_2O (in H_2O).
ρ_a	Density of acetone, $\text{mg}/\mu\text{l}$ (see label on bottle).
ρ_w	Density of water, 0.9982 g/ml (0.002201 lb/ml).
θ	Total sampling time, min.
13.6	Specific gravity of mercury.
60	Sec/min.
100	Conversion to percent.

3.3.1.7.7.2 Average dry gas meter temperature and average orifice pressure drop. See data sheet (Figure 3.3-2).

3.3.1.7.7.3 Dry gas volume. Correct the sample measured by the dry gas meter to standard conditions (20 °C, 760 mm Hg [68 °F, 29.92 in. Hg]) by using Equation 1:

$$V_{m(mgd)} = V_m Y \frac{T_m}{T_n} \frac{P_{bar} + \Delta H/13.6}{P_m}$$

$$K_1 V_m Y \frac{P_{bar} + \Delta H/13.6}{T_n} \quad (1)$$

$K_1 = 0.3858 \text{ K/mm Hg}$ for metric units, or
 $K_1 = 17.64 \text{ }^\circ \text{R/in. Hg}$ for English units.

3.3.1.7.7.4 Volume of water vapor.

$$V_{w(mgd)} = V_k \frac{P_w}{M_w} \frac{RT_m}{P_m} = K_2 V_k \quad (2)$$

$K_2 = 0.001333 \text{ m}^3/\text{ml}$ for metric units, or
 $K_2 = 0.04707 \text{ m}^3/\text{ml}$ for English units.

3.3.1.7.7.5 Moisture content.

$$B_{wg} = \frac{V_{w(mgd)}}{V_{m(mgd)} + V_{w(mgd)}} \quad (3)$$

Note: In saturated or water-droplet-laden gas streams, two calculations of the moisture content of the stack gas shall be made, one from the impinger analysis (Equation 3) and a second from the assumption of saturated conditions. The lower of the two values of Bw shall be considered correct. The procedure for determining the moisture content based upon assumption of saturated conditions is given in the Note to section 1.2 of Method 4. For the purposes of this method, the average stack gas temperature from Figure 2 may be used to make this determination, provided that the accuracy of the in-stack temperature sensor is ± 1 °C (2 °F).

3.3.1.7.7.6 Acetone blank concentration. For particulate determination.

$$C_a = \frac{m_a}{V_a P_a} \quad (4)$$

3.3.1.7.7.7 Acetone blank concentration. For particulate determination.

$$W_s = C_s V_{std} \Delta \quad (5)$$

3.3.1.7.7.8 Total particulate weight. Determine the total particulate catch from the sum of the weights obtained from Container Nos. 1 and 2 less the acetone blank (W_A).

3.3.1.7.7.9 Particulate concentration.

$$C_s = (0.001 \text{ g/mg})(m_s/V_{std}) \quad (6)$$

3.3.1.7.7.10 Isokinetic variation.

3.3.1.7.7.10.1 Calculation from raw data.

$$I = \frac{100 T_s [K_3 F_{1c} + (V_m/T_m)(P_{wp} + H/13.6)]}{60 \ominus V_s P_s A_s} \quad (7)$$

where:

$K_3 = 0.003454 \text{ mm Hg} - \text{m}^3/\text{ml} - \text{K}$ for metric units, or

$K_3 = 0.002669 \text{ in. Hg} - \text{ft}^3/\text{ml} - \text{R}$ for English units.

3.3.1.7.7.10.2 Calculation for intermediate values.

$$= K_4 \frac{T_s V_m (std)}{P_s V_s A_s \ominus (1 - B_{wp})} \quad (8)$$

where:

$K_4 = 4.320$ for metric units, or

$K_4 = 0.09450$ for English units.

$$I = \frac{T_s V_m (std) P_{std} 100}{T_{std} V_s \ominus A_s P_s 60 (1 - B_{wp})}$$

3.3.1.7.7.10.3 Acceptable units. If 90 percent $< I < 110$ percent, the results are acceptable. If the results are low in comparison with the standard and I is beyond the acceptable range, or if I is less than 90 percent, the Department may opt to accept the results.

3.3.1.8 Quality Control.

3.3.1.8.1 Sampling. See EPA Manual 600/4-77-027b for Method 5 quality control.

3.3.1.8.2 Analysis. At the present time, a validated audit material does not exist for this method. Analytical quality control procedures are detailed in Method 9057.

3.3.1.9 Method Performance.

3.3.1.9.1 The in-stack detection limit for the method is approximately 0.02 μg of HCl per liter of stack gas. The method has a negative bias below 20 ppm HCl (Reference 6).

3.3.1.9.2 It is preferable to include the cyclone in the sampling train to protect the filter from any moisture present. There is research in progress regarding the necessity of the cyclone at low moisture sources and the use of Ascarite II in the drying procedure (Section 3.3.1.7.5.12).

References

1. U.S. Environmental Protection Agency, 40 CFR part 60, appendix A, Methods 1-5.
2. U.S. Environmental Protection Agency, "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods," Publication No. EPA-600/4-77-027b, August 1977.
3. Shigehara, R.T., Adjustments in the EPA Nomography for Different Pitot Tube Coefficients and Dry Molecular Weights, Stack Sampling News, 2:4-11 (October 1974).
4. Steinsberger, S.C. and J.H. Margeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA 600/3-89/064, NTIS PB89 220586-AS.
5. State of California, Air Resources Board, method 421, "Determination of Hydrochloric Acid emissions from Stationary Sources," March 18, 1987.
6. Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride Emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-4442, Research Triangle Park, North Carolina, January 22, 1988.

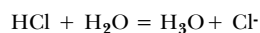
3.3.2 Midget Impinger HCl/Cl₂ Emission Sampling Train (Method 0051)

3.3.2.1 Scope and Application.

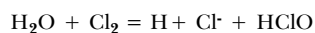
3.3.2.1.1 This method describes the collection of hydrogen chloride (HCl, CAS Registry Number 7647-01-0) and chlorine (Cl₂, CAS Registry Number 7782-50-5) in stack gas emission samples from hazardous waste incinerators, municipal waste combustors, and boilers and industrial furnaces. The collected samples are analyzed using method 9057. This method is designed to collect HCl/Cl₂ in their gaseous forms. Sources, such as those controlled by wet scrubbers, that emit acid particulate matter (e.g., HCl dissolved in water droplets) must be sampled using an isokinetic HCl/Cl₂ sampling train (see Method 0050).

3.3.2.2 Summary of Method.

3.3.2.2.1 An integrated gas sample is extracted from the stack and passes through a particulate filter, acidified water, and finally through an alkaline solution. The filter serves to remove particulate matter such as chloride salts which could potentially react and form analyte in the absorbing solutions. In the acidified water absorbing solution, the HCl gas is solubilized and forms chloride ions (Cl⁻) as follows:



The Cl₂ gas present in the emissions has a very low solubility in acidified water and passes through to the alkaline absorbing solution where it undergoes hydrolysis to form a proton (H⁺), Cl⁻, and hypochlorous acid (HClO) as follows:



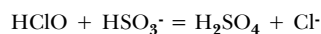
The Cl⁻ ions in the separate solutions are measured by ion chromatography (Method 9057).

3.3.2.3 Interferences.

3.3.2.3.1 Volatile materials which produce chloride ions upon dissolution during sampling are obvious interferences in the measurement of HCl. One interferant for HCl is diatomic chlorine (Cl₂) gas which disproportionates to HCl and hypochlorous acid (HClO) upon

dissolution in water. Cl₂ gas exhibits a low solubility in water, however, and the use of acidic rather than neutral or basic solutions for collection of hydrogen chloride gas greatly reduces the dissolution of any chlorine present. Sampling a 400 ppm HCl gas stream containing 50 ppm Cl₂ with this method does not cause a significant bias. Sampling a 220 ppm HCl gas stream containing 180 ppm Cl₂ results in a positive bias of 3.4 percent in the HCl measurement.

3.3.2.3.2 Reducing agents such as SO₂ may cause a positive bias in the Cl₂ measurement by the following reaction:



3.3.2.4 Apparatus and Materials.

3.3.2.4.1 Sampling Train. The sampling train is shown in Figure 1 and component parts are discussed below.

3.3.2.4.1.1 Probe. Borosilicate glass, approximately 3/8-in (9-mm) inside diameter, with a heating system to prevent condensation. When the concentration of alkaline particulate matter in the emissions is high, a 3/8-in (9-mm) inside diameter Teflon elbow should be attached to the inlet of the probe; a 1-in (25-mm) length of Teflon tubing with a 3/8-in (9-mm) inside diameter should be attached at the open end of the elbow to permit the opening of the probe to be burned away from the gas stream, thus reducing the amount of particulate entering the train. When high concentrations of particulate matter are not present, the Teflon elbow is not necessary, and the probe inlet can be perpendicular to the gas stream. When sampling at locations where gas temperatures are greater than approximately 400°F, such as wet scrubber inlets, glass or quartz elbows must be used. In no case should a glass wool plug be used to remove particulate matter; use of such a filtering device could result in a bias in the data.(1) Instead, a Teflon filter should be used as specified in section 3.3.2.5.5.

3.3.2.4.1.2 Three-way stopcock. A borosilicate, three-way glass stopcock with a heating system to prevent condensation. The heated stopcock should connect directly to the outlet of the probe and filter assembly and the inlet of the first impinger. The heating system should be capable of preventing condensation up to the inlet of the first impinger. Silicone grease may be used, if necessary, to prevent leakage.

3.3.2.4.1.3 Impingers. Five 30-ml midget impingers with leak-free glass connectors. Silicone grease may be used, if necessary, to prevent leakage. For sampling at high moisture sources or for extended sampling times greater than one hour, a midget impinger with a shortened stem (such that the gas sample does not bubble through the collected condensate) should be used in front of the first impinger.

3.3.2.4.1.4 Mae West impinger or drying tube. Mae West design impinger (or drying tube, if a moisture determination is not to be conducted) filled with silica gel, or equivalent, to dry the gas sample and to protect the dry gas meter and pump.

3.3.2.4.1.5 Sample Line. Leak-free, with compatible fittings to connect the last impinger to the needle valve.

3.3.2.4.1.6 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby National Weather Service station, in which case the station value (which is the absolute barometric pressure) shall be requested and an adjustment for the elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice versa for elevation decrease.

3.3.2.4.1.7 Purge pump, purge line, drying tube, needle valve, and rate meter. Pump capable of purging sample probe at 2 liters/min, with drying tube, filled with silica gel or equivalent, to protect pump, and a rate meter, 0 to 5 liters/min.

3.3.2.4.1.8 Metering system. The following items comprise the metering system which is identical to that used for EPA Method 6 (see Reference 5).

3.3.2.4.1.8.1 Valve. Needle valve, to regulate sample gas flow rate.

3.3.2.4.1.8.2 Pump. Leak-free diaphragm pump, or equivalent, to pull gas through train. Install a small surge tank between the pump and the rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter.

3.3.2.4.1.8.3 Rate meter. Rotameter, or equivalent, capable of measuring flow rate to within 2 percent of selected flow rate of 2 liters/min.

3.3.2.4.1.8.4 Volume meter. Dry gas meter, sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions encountered during sampling, and equipped with a temperature gauge (dial thermometer or equivalent) capable of measuring temperature to within 3°C (5.4°F).

3.3.2.4.1.8.5 Vacuum gauge. At least 760 mm Hg (30 in. Hg) gauge to be used for leak check of the sampling train.

3.3.2.4.2 Sample Recovery.

3.3.2.4.2.1 Wash bottles. Polyethylene or glass, 500 ml or larger, two.

3.3.2.4.2.2 Storage bottles. Glass, with Teflon-lined lids, 100 ml, to store impinger samples (two per sampling run).

3.3.2.5 Reagents.

3.3.2.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.3.2.5.2 ASTM Type II Water (ASTM D1193-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.3 Sulfuric acid (0.1 N), H₂SO₄. Used as the HCl absorbing reagent. To prepare 100 ml, slowly add 0.28 ml of concentrated H₂SO₄ to about 90 ml of water while stirring, and adjust the final volume to 100 ml using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.4 Sodium hydroxide (0.1 N), NaOH. Used as the Cl₂ absorbing reagent. To prepare 100 ml, dissolve 0.40 g of solid NaOH in about 90 ml of water and adjust the final volume to 100 ml using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.5 Filter. Teflon mat Pallflex● TX40HI75 or equivalent. Locate in a glass, quartz, or Teflon filter holder with a Teflon filter support in a filter box heated to 250°F.

3.3.2.5.6 Stopcock grease. Acetone-insoluble, heat-stable silicone grease may be used, if necessary.

3.3.2.5.7 Silica gel. Indicating type, 6- to 16-mesh. If the silica gel has been used previously, dry at 175°C (350°F) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used.

3.3.2.6 Sample Collection, Preservation, and Handling.

3.3.2.6.1 Sample collection is described in this method. The analytical procedures are described in method 9057.

3.3.2.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.2.7 Procedure.

3.3.2.7.1 Calibration. Section 3.5.2 of EPA's Quality Assurance Handbook, Volume III (Reference 4) may be used as a guide for these operations.

3.3.2.7.1.1 Dry Gas Metering System.

3.3.2.7.1.1.1 Initial calibration. Before its initial use in the field, first leak check the metering system (sample line, drying tube, if used, vacuum gauge, needle valve, pump, rate meter, and dry gas meter) as follows: plug the inlet end of the sampling line, pull a vacuum of 250 mm (10 in) Hg, plug off the outlet of the dry gas meter, and turn off the pump. The vacuum should remain stable for 30 seconds. Carefully release the vacuum from the system by slowly removing the plug from the sample line inlet. Remove the sampling line (and drying tube, if applicable), and connect the dry gas metering system to an appropriately sized wet test meter (e.g., 1 liter per revolution). Make three independent calibration runs, using at least five revolutions of the dry gas meter per run. Calculate the calibration factor, Y (wet test meter calibration volume divided by the dry gas meter volume, with both volumes adjusted to the same reference temperature and pressure), for each run, and average the results. If any Y value deviates by more than 2 percent from the average, the metering system is unacceptable for use. Otherwise, use the average as the calibration factor for subsequent test runs.

3.3.2.7.1.1.2 Post-test calibration check. After each field test series, conduct a calibration check as in section 3.3.2.7.1.1.1 above, except for the following variations: (a) The leak check is not to be conducted, (b) three or more revolutions of the dry gas meter may be used, (c) only two independent runs need to be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in section 3.3.2.7.1.1.1), the dry gas meter volumes obtained during the test series are acceptable. If the calibration factor deviates by more than 5 percent, recalibrate the metering system as section 3.3.2.7.1.1.1, and for the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

3.3.2.7.1.2 Thermometer(s). Prior to each field test, calibrate against mercury-in-glass thermometers at ambient temperature. If the thermometer being calibrated reads within 2°C (2.6°F) of the mercury-in-glass thermometer, it is acceptable. If not, adjust the thermometer or use an appropriate correction factor.

3.3.2.7.1.3 Rate meter. The rate meter need not be calibrated, but should be cleaned and maintained according to the manufacturer's instructions.

3.3.2.7.1.4 Barometer. Prior to each field test, calibrate against a mercury barometer. The field barometer should agree within 0.1 in. Hg with the mercury barometer. If it does not, the field barometer should be adjusted.

3.3.2.7.2 Sampling.

3.3.2.7.2.1 Preparation of collection train. Prepare the sampling train as follows: The first or knockout impinger should have a shortened stem and be left empty to condense moisture in the gas stream. The next two midjet impingers should each be filled with 15 ml of 0.1 N H₂SO₄, and the fourth and fifth impingers should each be filled with 15 ml of 0.1 N NaOH. Place a fresh charge of silica gel, or equivalent, in the Mae West impinger (or the drying tube). Connect the impingers in series with the knockout impinger first, followed by the two impingers containing the acidified reagent, the two impingers containing the alkaline reagent, and the Mae West impinger containing the silica gel. If the moisture will be determined, weigh the impinger assembly to the nearest ± 0.5 g and record the weight.

3.3.2.7.2.2 Leak check procedures. Leak check the probe and three-way stopcock prior to inserting the probe into the stack. Connect the stopcock to the outlet of the probe, and connect the sample line to the needle valve. Plug the probe inlet, turn on the sample pump, and pull a vacuum of at least 250 mm Hg (10 in. Hg). Turn off the needle valve, and note the vacuum gauge reading. The vacuum should remain stable for at least 30 seconds. Place the probe in the stack at the sampling location, and adjust the filter heating system to 250°F and the probe and stopcock heating systems to a temperature sufficient to prevent water condensation. Connect the first impinger to the stopcock, and connect the sample line to the last impinger and the needle valve. Upon completion of a sampling run, remove the probe from the stack and leak check as described above. If a leak has occurred, the sampling run must be voided. Alternatively, the portion of the train behind the probe may be leak checked between multiple runs at the same site as follows: Close the stopcock to the first impinger (see

Figure 3.3-3A), and turn on the sample pump. Pull a vacuum of at least 250 mm Hg (10 in. Hg), turn off the needle valve, and note the vacuum gauge reading. The vacuum should remain stable for at least 30 seconds. Release the vacuum on the impinger train by turning the stopcock to the vent position to permit ambient air to enter (see Figure 3.3-3B). If this procedure is used, the full train leak check described above must be conducted following the final run and all preceding sampling runs voided if a leak has occurred.

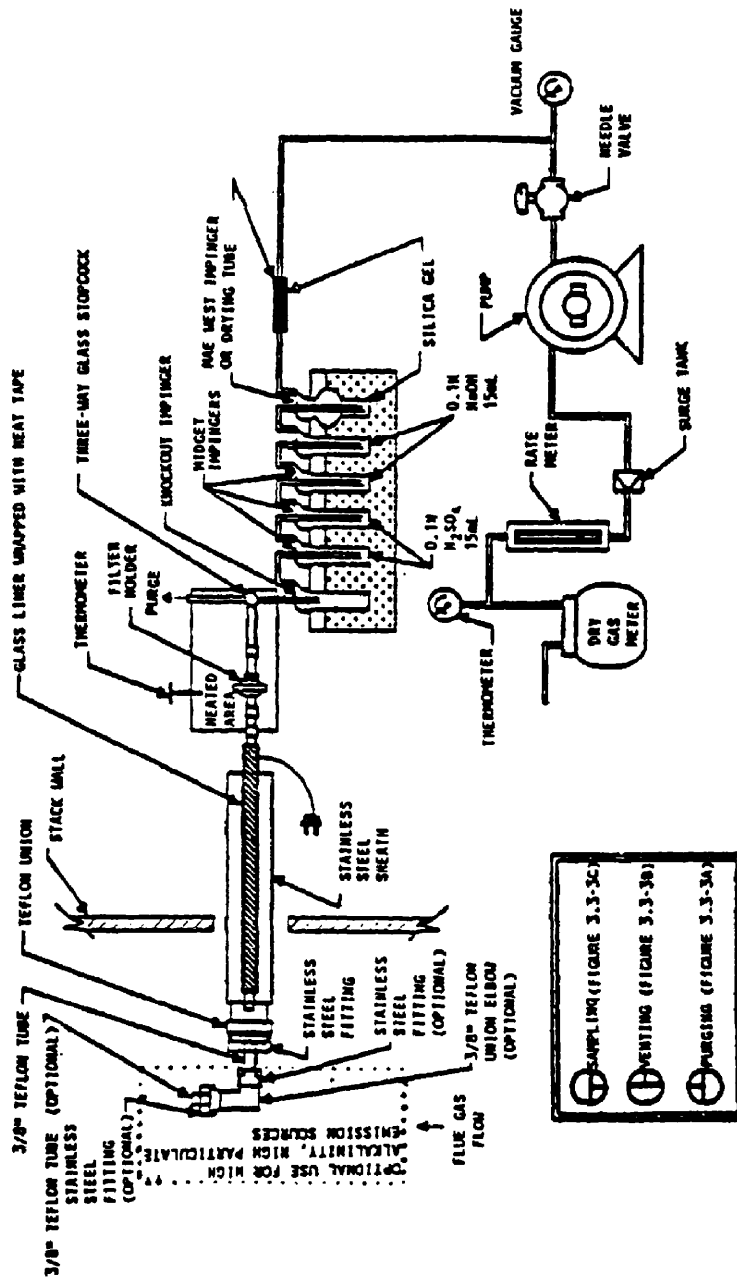


Figure 3.3-3 Midget Impinger HCl/Cl₂ Sampling Train

[Appendix IX]

3.3.2.7.2.3 Purge procedure. Immediately prior to sampling, connect the purge line to the stopcock and turn the stopcock to permit the purge pump to purge the probe (see Figure

3.3-3A). Turn on the purge pump, and adjust the purge rate to 2 liters/min. Purge for at least 5 minutes prior to sampling.

3.3.2.7.2.4 Sample collection. Turn on sample pump, pull a slight vacuum of approximately 25 mm Hg (1 in. Hg) on the impinger train, and turn the stopcock to permit stack gas to be pulled through the impinger train (see Figure 3.3-3C). Adjust the sampling rate to 2 liters/min, as indicated by the rate meter, and maintain this rate within 10 percent during the entire sampling run. Take readings of the dry gas meter, the dry gas meter temperature, rate meter, and vacuum gauge at least once every five minutes during the run. A sampling time of one hour is recommended. However, if the expected condensate catch for this sampling run duration will exceed the capacity of the sampling train, (1) a larger knockout impinger may be used or (2) two sequential half-hour runs may be conducted. At the conclusion of the sampling run, remove the train from the stack, cool, and perform a leak check as described in section 3.3.2.7.2.2.

3.3.2.7.3 Sample recovery. Following sampling, disconnect the impinger train from the remaining sampling equipment at the inlet to the knockout impinger and the outlet to the last impinger. If performing a moisture determination, wipe off any moisture on the outside of the train and any excess silicone grease at the inlet and outlet openings; weigh the train to the nearest 0.5 g and record this weight. Then disconnect the impingers from each other. Quantitatively transfer the contents of the first three impingers (the knockout impinger and the two 0.1 N H₂SO₄ impingers) to a leak-free storage bottle. Add the water rinses of each of these impingers and connecting glassware from the second set of impingers (containing the 0.1 N NaOH) should be recovered in a similar manner if a Cl₂ analysis is desired. The sample bottle should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Save portions of the 0.1 N H₂SO₄ and 0.1 N NaOH used as impinger reagents as reagent blanks. Take 50 ml of each and place in separate leak-free storage bottles. Label and mark the fluid levels as previously described.

3.3.2.7.4 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.2.7.4.1 Nomenclature.

B_{WS} = Water vapor in the gas stream, proportion by volume.

M_W = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

P_{BAR} = Barometric pressure at the exit orifice of the dry gas meter, mm Hg (in. Hg).

P_{STD} = Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

R = Ideal gas constant, 0.06236 mm Hg-m³/°K-g-mole (21.85 in. Hg-ft³R-lb-mole).

T_M = Average dry gas meter absolute temperature, °K (°R).

T_{STD} = Standard absolute temperature, 293 °K (528 °R).

V_{IC} = Total volume of liquid collected in impingers and silica gel, ml (equivalent to the difference in weight of the impinger train before and after sampling, 1 mg = 1 ml).

V_M = Dry gas volume as measured by the dry gas meter, dcm (dcf).

V_{M(STD)} = Dry gas volume as measured by the dry gas meter, dcm (dcf).

V_{W(STD)} = Volume of water vapor in the gas sample, corrected to standard conditions; scm (scf).

Y = Dry gas meter calibration factor.

P_W = Density of water, 0.9982 g/ml (0.002201 lb/ml).

3.3.2.7.4.2 Sample volume, dry basis, corrected to standard conditions. Calculate as described below:

$$\begin{aligned}
 V_m(\text{std}) &= V_m Y \left[\frac{T_{\text{std}}}{T_m} \right] \left[\frac{P_{\text{bar}}}{P_{\text{std}}} \right] \\
 &= K_1 Y \frac{V_m P_{\text{bar}}}{T_m} \quad (1)
 \end{aligned}$$

where:

$K_1 = 0.3858 \text{ }^\circ\text{K/mm Hg}$ for metric units.

$K_1 = 17.64 \text{ }^\circ\text{R/in. Hg}$ for English units.

3.3.2.7.4.3 Volume of water vapor.

$$\begin{aligned}
 V_{w(\text{std})} &= V_L \frac{P_w}{M_w} \frac{RT_{\text{std}}}{P_{\text{std}}} \\
 &= K_2 V_m \quad (2)
 \end{aligned}$$

where:

$K_2 = 0.0013333 \text{ m}^3/\text{ml}$ for metric units.

$K_2 = 0.04707 \text{ ft}^3/\text{ml}$ for English units.

3.3.2.7.4.4 Moisture content.

$$B_{ws} = \frac{V_{w(\text{std})}}{V_{m(\text{std})} + V_w} \quad (3)$$

3.3.2.8 Quality Control.

3.3.2.8.1 At the present time, a validated audit material does not exist for this method. Analytical quality control procedures are detailed in Method 9057.

3.3.2.9 Method Performance.

3.3.2.9.1 The in-stack detection limit for the method is approximately 0.08 μg of HCl per liter of stack gas for a 1-hour sample.

3.3.2.9.2 The precision and bias for measurement of HCl using this sampling protocol combined with the analytical protocol of method 9057 have been determined. The within laboratory relative standard deviation is 6.2 percent and 3.2 percent at HCl concentrations of 3.9 and 15.3 ppm, respectively. The method does not exhibit any bias for HCl when sampling at Cl_2 concentrations less than 50 ppm.

References

1. Steinsberger. S.C. and J.H. Margeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste

Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA 600/3-89/064, NTIS PB 89 220586-AS.

2. State of California, Air Resources Board, Method 421, "Determination of Hydrochloric Acid Emissions from Stationary Sources," March 18, 1987.

3. Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride Emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-4442, Research Triangle Park, North Carolina, January 22, 1988.

4. U.S. Environmental Protection Agency, "Quality Assurance Handbook for Air Pollution Measurement Systems, volume III, Stationary Source Specific Methods," Publication No. EPA-600/4-77-027b, August 1977.

5. U.S. Environmental Protection Agency, 40 CFR part 60, appendix A, method 6.

3.3.3 Protocol for Analysis of Samples from HCl/Cl₂ Emission Sampling Train (Method 9057)

3.3.3.1 Scope and Application.

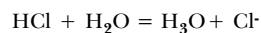
3.3.3.1.1 This method describes the analytical protocol for determination of hydrogen chloride (HCl, CAS Registry Number 7647-01-0) and chloride (Cl₂, CAS Registry Number 7782-50-5) in stack gas emission samples collected from hazardous waste and municipal waste incinerators using the midjet impinger HCl/Cl₂ sampling train (method 0051) or the isokinetic HCl/Cl₂ sampling train (method 0050).

3.3.3.1.2 The lower detection limit is 0.1 ug of chloride (Cl⁻) per ml of sample solution. Samples with concentrations which exceed the linear range of the analytical instrumentation may be diluted.

3.3.3.1.3 This method is recommended for use only by analysts experienced in the use of ion chromatography and in the interpretation of ion chromatograms.

3.3.3.2 Summary of Method.

3.3.3.2.1 The stoichiometry of HCl and Cl₂ collection in the sampling train (see methods 0050 and 0051) is as follows: In the acidified water absorbing solution, the HCl gas is solubilized and forms chloride ions (Cl⁻) according to the following formula:



The Cl₂ gas present in the emissions has a very low solubility in acidified water and passes through to the alkaline absorbing solution where it undergoes hydrolysis to form a proton (H⁺), Cl⁻, and hypochlorous acid (HClO) as shown:

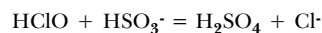


Non-suppressed or suppressed ion chromatography (IC) is used for analysis of the Cl⁻.

3.3.3.3 Interferences.

3.3.3.3.1 Volatile materials which produce chloride ions upon dissolution during sampling are obvious interferences in the measurement of HCl. One likely interferant is diatomic chlorine (Cl₂) gas which disproportionates to HCl and hypochlorous acid (HOCl) upon dissolution in water. Cl₂ gas exhibits a low solubility in water, however, and the use of acidic rather than neutral or basic solutions for collection of hydrogen chloride gas greatly reduces the dissolution of any chlorine present. Sampling a 400 ppm HCl gas stream containing 50 ppm Cl₂ with this method does not cause a significant bias. Sampling a 220 ppm HCl gas stream containing 180 ppm Cl₂ results in a positive bias of 3.4 percent in the HCl measurement. Other interferants have not been encountered.

3.3.3.3.2 Reducing agents such as SO₂ may cause a positive bias in the Cl₂ measurement by the following reaction:



3.3.3.4 Apparatus and Materials.

3.3.3.4.1 Volumetric Flasks. Class A, various sizes.

3.3.3.4.2 Volumetric Pipettes. Class A, assortment, to dilute samples to calibration range of the IC.

3.3.3.4.3 Ion Chromatograph. Suppressed or non-suppressed, with a conductivity detector and electronic integrator operating in the peak area mode. Other detectors, a strip chart recorder, and peak heights may be used provided the 5 percent repeatability criteria for sample analysis and the linearity criteria for the calibration curve can be met.

3.3.3.5 Reagents.

3.3.3.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.3.3.5.2 ASTM Type II Water (ASTM D1193-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified.

3.3.3.5.3 Sulfuric acid (0.1 N), H₂SO₄. To prepare 100 ml, slowly add 0.28 ml of concentrated H₂SO₄ to about 90 ml of water while stirring, and adjust the final volume to 100 ml using additional water. Shake well to mix the solution.

3.3.3.5.4 Sodium hydroxide (0.1 N), NaOH. To prepare 100 ml, dissolve 0.40 g of solid NaOH in about 90 ml of water and adjust the final volume to 100 ml using additional water. Shake well to mix the solution.

3.3.3.5.5 Reagent blank solutions. A separate blank solution of each sampling train reagent used and collected in the field (0.1 N H₂SO₄ and 0.1 N NaOH) should be prepared for analysis with the field samples. For midjet impinger train sample analysis, dilute 30 ml of each reagent with rinse water collected in the field as a blank to the final volume of the samples; for isokinetic train sample analysis, dilute 200 ml to the same final volume as the field samples also using the blank sample of rinse water.

3.3.3.5.6 Sodium chloride, NaCl, stock standard solution. Solutions containing a nominal certified concentration of 1000 mg/L NaCl are commercially available as convenient stock solutions from which working standards can be made by appropriate volumetric dilution. Alternately, concentrated stock solutions may be produced from reagent grade NaCl that has been dried at 110 °C for two or more hours and then cooled to room temperature in a desiccator immediately before weighing. Accurately weigh 1.6 to 1.7 g of the dried NaCl to within 0.1 mg, dissolve in water, and dilute to 1 liter. The exact Cl⁻ concentration can be calculated using the equation:

$$\mu\text{g Cl}^-/\text{ml} = \text{g of NaCl} \times 103 \times 35.453/58.44$$

Refrigerate the stock standard solutions and store no longer than one month.

3.3.3.5.7 Chromatographic eluent. Effective eluents for non-suppressed ion chromatography using a resin- or silica-based weak ion exchange column are a 4 mM potassium hydrogen phthalate solution, adjusted to a pH of 4.0 using a saturated sodium borate solution, and a mM 4-hydroxy benzoate solution, adjusted to a pH of 8.6 using 1 N sodium hydroxide. An effective eluent for suppressed ion chromatography is a solution containing 3 mM sodium bicarbonate and 2.4 mM sodium carbonate. Other dilute solutions buffered to a similar pH that contain no ions interfering with the chromatographic analysis may be used. If, using suppressed ion chromatography, the "water dip" resulting from sample injection is interfering with the chlorine peak, use a 2 mM sodium hydroxide/2.4 mM sodium bicarbonate eluent.

3.3.3.6 Sample Collection, Preservation, and Handling.

3.3.3.6.1 Sample collection using the midjet impinger HCl/Cl₂ train or the isokinetic HCl/Cl₂ train is described in Method 0051 or 0050, respectively.

3.3.3.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.3.7 Procedure.

3.3.3.7.1 Sample preparation for analysis. Check the liquid level in each sample, and determine if any sample was lost during shipment. If a noticeable amount of leakage has occurred, the volume can be determined from the difference between the initial and final solution levels, and this value can be used to correct the analytical results. For midjet impinger

train samples, quantitatively transfer each sample solution to a 100 ml volumetric flask and dilute to 100 ml with water. For isokinetic sampling train samples, quantitatively transfer each sample to a volumetric flask or graduated cylinder and dilute with water to a final volume appropriate for all samples.

3.3.3.7.2 Calibration of Ion Chromatograph.

3.3.3.7.2.1 The ion chromatographic conditions will depend on the type of analytical column used and whether suppressed or non-suppressed ion chromatography is used. Prior to calibration and sample analysis, establish a stable baseline. Next, inject a sample of water, and determine if any Cl^- appears in the chromatogram. If Cl^- is present, repeat the load/injection procedure until no Cl^- is present.

3.3.3.7.2.2 To prepare the calibration standards, dilute given amounts (1.0 ml or greater) of the stock standard solution to convenient volumes, using 0.1 H_2SO_4 or 0.1 NaOH as appropriate. Prepare at least four standards that are within the linear range of the field samples. Inject the calibration standards, starting with the lowest concentration standard first, both before and after injection of the quality control check sample, reagent blank, and field samples. This allows compensation for any instrument drift occurring during sample analysis.

3.3.3.7.2.3 Determine the peak areas, or heights, of the standards and plot individual values versus Cl^- concentrations in $\mu\text{g}/\text{ml}$. Draw a smooth curve through the points. Use linear regression to calculate a formula describing the resulting linear curve.

3.3.3.7.3 Sample analysis. Between injections of the series of calibration standards, inject in duplicate the reagent blanks and the field samples, including a matrix spike sample. Measure the areas or heights (same as done for the calibration standards) of the Cl^- peaks. Use the average response to determine the concentrations of the field samples, matrix spike, and reagent blanks using the linear calibration curve. The results for a reagent blank should not exceed 10 percent of the corresponding value for a field sample.

3.3.3.7.4 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.3.7.4.1 Total μg HCl per sample. Calculate as described below:

$$M_{\text{HCl}} = (S - B) \times V_S \times 36.46/35.453 \quad (1)$$

where:

M_{HCl} = Mass of HCl in sample, μg ,

S = Analysis of sample, μg Cl/ml ,

V_S = Volume of filtered and diluted sample, ml ,

36.46 = Molecular weight of HCl , $\mu\text{g}/\mu\text{g-mole}$, and

35.45 = Atomic weight of Cl , $\mu\text{g}/\mu\text{g-mole}$.

3.3.3.7.4.2 Total μg Cl_2 per sample. Calculate as described below:

$$M_{\text{Cl}_2} = (S - B) \times V_2 \times 70.91/35.45 \quad (2)$$

where:

M_{Cl_2} = Mass of Cl_2 in sample, μg ,

70.91 = Molecular weight of Cl_2 , $\mu\text{g}/\mu\text{g-mole}$, and

35.45 = Atomic weight of Cl , $\mu\text{g}/\mu\text{g-mole}$.

3.3.3.7.4.3 Concentration of HCl in the flue gas. Calculate as described below:

$$C = K \times m/V_{\text{M}(\text{STD})} \quad (3)$$

where:

C = Concentration of HCl or Cl_2 , dry basis, mg/dscm ,

$K = 10^3 \text{mg}/\mu\text{g}$,

m = Mass of HCl or Cl_2 in sample, μg , and

$V_{\text{M}(\text{STD})}$ = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (from Method 0050 or Method 0051).

3.3.3.8 Quality Control.

3.3.3.8.1 At the present time, a validated audit material does not exist for this method. However, it is strongly recommended that a quality control check sample and a matrix spike sample be used.

3.3.3.8.1.1 Quality control check sample. Chloride solutions of reliably known concentrations are available for purchase from the National Bureau of Standards (SRM 3182). The QC check sample should be prepared in the appropriate absorbing reagent at a concentration approximately equal to the mid range calibration standard. The quality control check sample should be injected in duplicate immediately after the calibration standards have been injected for the first time. The Cl⁻ value obtained for the check sample using the final calibration curve should be within 10 percent of the known value for the check sample.

3.3.3.8.1.2 Matrix spike sample. A portion of at least one field sample should be used to prepare a matrix spike sample. Spike the sample aliquot in the range of the expected concentration. Analyze the matrix spike sample in duplicate along with the field samples. Based on the matrix spike results, determine the recovery for the spiked material. This should be within 10 percent of the known spike value.

3.3.3.9 Method Performance.

3.3.3.9.1 The lower detection limit of the analytical method is 0.1 μg of Cl⁻ per ml of sample solution. Samples with concentrations which exceed the linear range of the IC may be diluted.

3.3.3.9.2 The precision and bias for analysis of HCl using this analytical protocol have been measured in combination with the midjet impinger HCl/Cl₂ train (method 0051) for sample collection. The within-laboratory relative standard deviation is 6.2 percent and 3.2 percent at HCl concentrations of 3.9 and 15.3 ppm, respectively. The method does not exhibit any bias for HCl when sampling at Cl₂ concentrations less than 50 ppm.

References

1. Steinsberger, S.C. and J.H. Margeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA 600/3-89/064, NTIS PB89 220586-AS.

2. State of California, Air Resources Board, Method 421, "Determination of Hydrochloric Acid Emissions from Stationary Sources" March 18, 1987.

3. Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-4442, Research Triangle Park, North Carolina, January 22, 1988.

3.4 Determination of Polychlorinated Dibenzop-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) From Stationary Sources (Method 23)

3.4.1 Applicability and Principle

3.4.1.1 Applicability. This method is applicable to the determination of polychlorinated dibenzop-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) from stationary sources.

3.4.1.2 Principle. A sample is withdrawn from the gas stream isokinetically and collected in the sample probe, on a glass fiber filter, and on a packed column of adsorbent material. The sample cannot be separated into a particle vapor fraction. The PCDDs and PCDFs are extracted from the sample, separated by high resolution gas chromatography, and measured by high resolution mass spectrometry.

3.4.2 Apparatus

3.4.2.1 Sampling. A schematic of the sampling train used in this method is shown in Figure 3.4-1. Sealing greases may not be used in assembling the train. The train is identical to that described in Section 2.1 of Method 5 (40 CFR part 60, appendix A) with the following additions:

3.4.2.1.1 Reagents. Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available.

Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.4.2.1.2 Nozzle. The nozzle shall be made of nickel, nickel-plated stainless steel, quartz, or borosilicate glass.

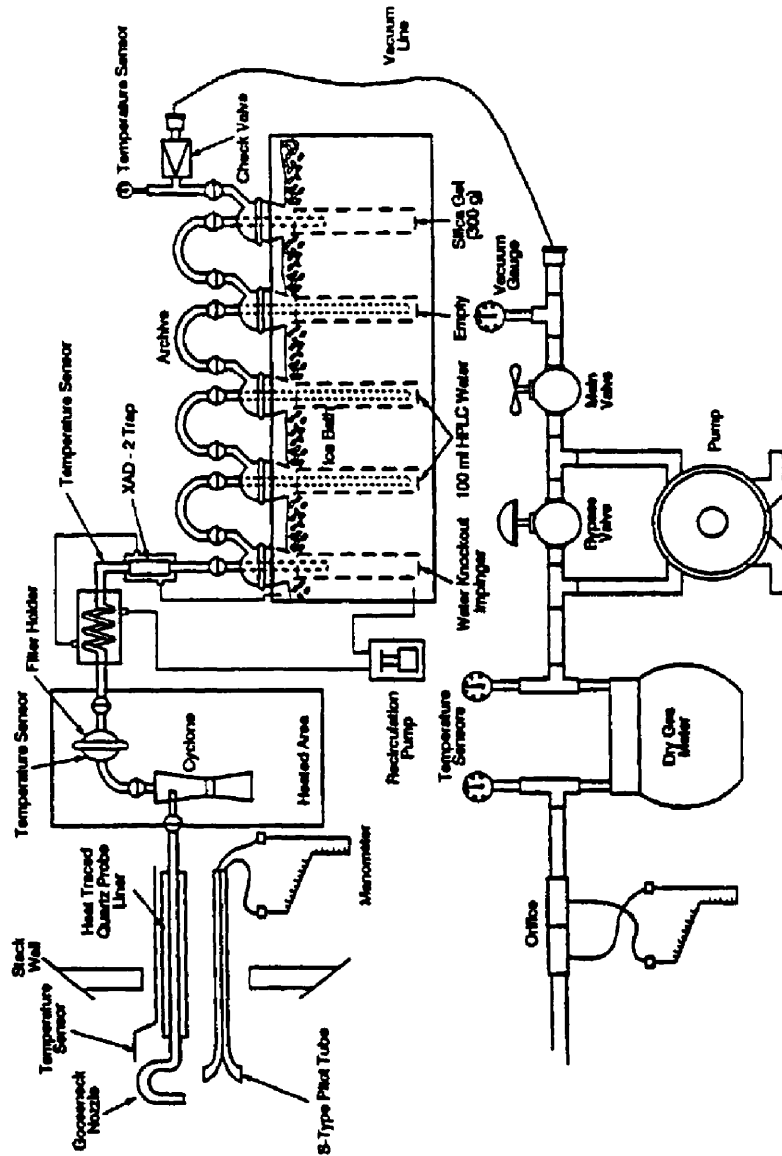


Figure 3.4-1 Sampling Train

3.4.2.1.3 Sample Transfer Lines. The sample transfer lines, if needed, shall be heat-traced, heavy walled TFE (½ in. OD with ⅛ in. wall) with connecting fittings that are capable of forming leak-free, vacuum-tight connections without using sealing greases. The line shall be as short as possible and must be maintained at 120 °C.

3.4.2.1.4 Filter Support. Teflon or Teflon-coated wire.

3.4.2.1.5 Condenser. Glass, coil type with compatible fittings. A schematic diagram is shown in Figure 3.4-2.

3.4.2.1.6 Water Bath. Thermostatically controlled to maintain the gas temperature exiting the condenser at <20 °C (68 °F).

3.4.2.1.7 Adsorbent Module. Glass container to hold the solid adsorbent. A schematic diagram is shown in Figure 3.4-2. Other physical configurations of the resin trap/condenser assembly are acceptable. The connecting fittings shall form leak-free, vacuum tight seals. No sealant greases shall be used in the sampling train. A coarse glass frit is included to retain the adsorbent.

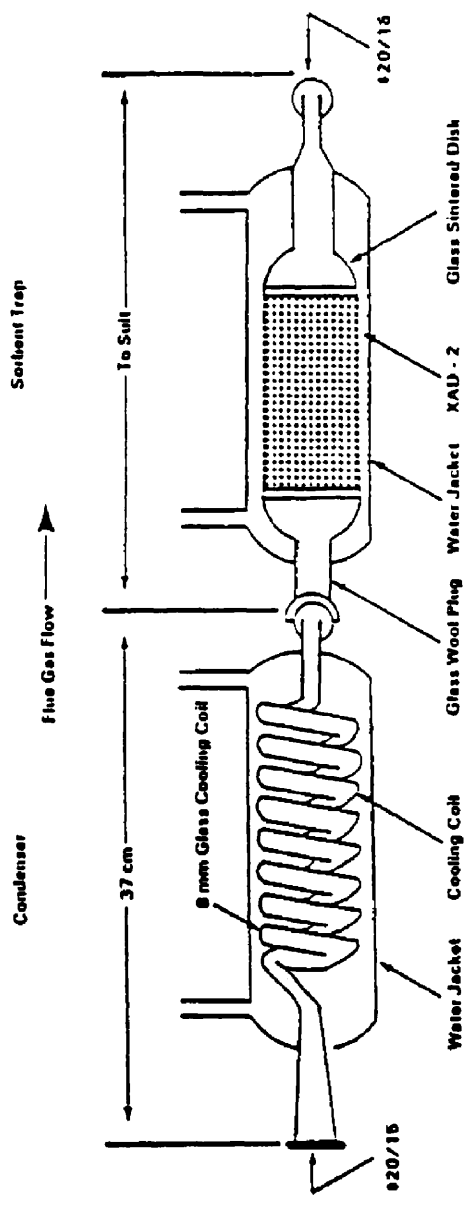


Figure 3.4-2 Condenser and adsorbent trap

[Appendix IX]

3.4.2.2 Sample Recovery.

3.4.2.2.1 Fitting Caps. Ground glass, Teflon tape, or aluminum foil (Section 3.4.2.2.6) to cap off the sample-exposed sections of the train.

3.4.2.2.2 Wash Bottles. Teflon, 500-ml.

3.4.2.2.3 Probe-Liner Probe-Nozzle, and Filter-Holder Brushes. Inert bristle brushes with precleaned stainless steel or Teflon handles. The probe brush shall have extensions of stainless steel or Teflon, at least as long as the probe. The brushes shall be properly sized and shaped to brush out the nozzle, probe liner, and transfer line, if used.

3.4.2.2.4 Filter Storage Container. Sealed filter holder, wide-mouth amber glass jar with Teflon-lined cap, or glass petri dish.

3.4.2.2.5 Balance. Triple beam.

3.4.2.2.6 Aluminum Foil. Heavy duty, hexane-rinsed.

3.4.2.2.7 Metal Storage Container. Air-tight container to store silica gel.

3.4.2.2.8 Graduated Cylinder. Glass, 250-ml with 2-ml graduation.

3.4.2.2.9 Glass sample Storage container. Amber glass bottle for sample glassware washes, 500- or 1000-ml, with leak-free Teflon-lined caps.

3.4.2.3 Analysis.

3.4.2.3.1 Sample Container. 125- and 250-ml flint glass bottles with Teflon-lined caps.

3.4.2.3.2 Test Tube. Glass.

3.4.2.3.3 Soxhlet Extraction Apparatus. Capable of holding 43 × 123 mm extraction thimbles.

3.4.2.3.4 Extraction Thimble. Glass, precleaned cellulosic, or glass fiber.

3.4.2.3.5 Pasteur Pipettes. For preparing liquid chromatographic columns.

3.4.2.3.6 Reacti-vials. Amber glass, 2-ml, silanized prior to use.

3.4.2.3.7 Rotary Evaporator. Buchi/Brinkman RF-121 or equivalent.

3.4.2.3.8 Nitrogen Evaporator Concentrator. N-Evap Analytical Evaporator Model III or equivalent.

3.4.2.3.9 Separatory Funnels. Glass, 2-liter.

3.4.2.3.10 Gas Chromatograph. Consisting of the following components:

3.4.2.3.10.1 Oven. Capable of maintaining the separation column at the proper operating temperature ± 1 °C and performing programmed increases in temperature at rates of at least 3 °C/min.

3.4.2.3.10.2 Temperature Gauge. To monitor column, oven, detector, and exhaust temperatures ± 1 °C.

3.4.2.3.10.3 Flow System. Gas metering system to measure sample, fuel, combustion gas, and carrier gas flows.

3.4.2.3.10.4 Capillary Columns. A fused silica column, 60 × 0.25 mm inside diameter (ID), coated with DB.5 and a fused silica column, 30 m × 0.25 mm ID coated with DB-225. Other column systems may be used provided that the user is able to demonstrate, using calibration and performance checks, that the column system is able to meet the specifications of section 3.4.6.1.2.2.

3.4.2.3.11 Mass Spectrometer. Capable of routine operation at a resolution of 1:10000 with a stability of ± 5 ppm.

3.4.2.3.12 Data System. Compatible with the mass spectrometer and capable of monitoring at least five groups of 25 ions.

3.4.2.3.13 Analytical Balance. To measure within 0.1 mg.

3.4.3 Reagents

3.4.3.1 Sampling.

3.4.3.1.1 Filters. Glass fiber filters, without organic binder, exhibiting at least 99.95 percent efficiency (<0.05 percent penetration) on 0.3-micron dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM Standard Method D 2986-71 (Reapproved 1978) (incorporated by reference-see 60.17).

3.4.3.1.1.1 Precleaning. All filters shall be cleaned before their initial use. Place a glass extraction thimble, 1 g of silica gel, and a plug of glass wool into a Soxhlet apparatus, charge the apparatus with toluene, and reflux for a minimum of 3 hours. Remove the toluene and discard it, but retain the silica gel. Place no more than 50 filters in the thimble onto the silica gel bed and top with the cleaned glass wool. Charge the Soxhlet with toluene and reflux for 16 hours. After extraction, allow the Soxhlet to cool, remove the toluene extract, and retain it for analysis. Remove the filters and dry them under a clean N₂ stream. Store the filters in a glass petri dish sealed with Teflon tape.

3.4.3.1.2 Adsorbent Resin. Amberlite XAD-2 resin, thoroughly cleaned before initial use.

3.4.3.1.2.1 Cleaning Procedure. This procedure may be carried out in a giant Soxhlet extractor. An all-glass filter thimble containing an extra-coarse frit is used for extraction of XAD-2. The frit is recessed 10-15 mm above a crenelated ring at the bottom of the thimble to facilitate drainage. The resin must be carefully retained in the extractor cup with a glass wool plug and a stainless steel ring because it floats on methylene chloride. This process involves sequential extraction in the following order:

Solvent	Procedure
Water	Initial rinse: Place resin in a beaker, rinse once with water, and discard. Fill with water a second time, let stand over-night, and discard.
Water	Extract with water for 8 hours.
Methanol	Extract for 22 hours.
Methylene Chloride	Extract for 22 hours.
Methylene Chloride (fresh)	Extract for 22 hours.

3.4.3.1.2.2 Drying.

3.4.3.1.2.2.1 Drying Column. Pyrex pipe, 10.2 cm ID by 0.6 m long, with suitable retainers.

3.4.3.1.2.2.2 Procedure. The adsorbent must be dried with clean inert gas. Liquid nitrogen from a standard commercial liquid nitrogen cylinder has proven to be a reliable source of large volumes of gas free from organic contaminants. Connect the liquid nitrogen cylinder to the column by a length of cleaned copper tubing, 0.95 cm ID, coiled to pass through a heat source. A convenient heat source is a water-bath heated from a steam line. The final nitrogen temperature should only be warm to the touch and not over 40 °C. Continue flowing nitrogen through the adsorbent until all the residual solvent is removed. The flow rate should be sufficient to gently agitate the particles but not so excessive as to cause the particles to fracture.

3.4.3.1.2.3 Quality Control Check. The adsorbent must be checked for residual methylene chloride as well as PCDDs and PCDFs.

3.4.3.1.2.3.1 Extraction. Weigh a 1.0 g sample of dried resin into a small vial, add 3 ml of toluene, cap the vial, and shake it well.

3.4.3.1.2.3.2 Analysis. Inject a 2- μ l sample of the extract into a gas chromatograph operated under the following conditions:

Column: 6 ft \times $\frac{1}{8}$ in. stainless steel containing 10 percent OV-101 on 100/120 Supelcoport.

Carrier Gas: Helium at a rate of 30 ml/min.

Detector: Flame ionization detector operated at a sensitivity of 4×10^{11} A/mV.

Injection Port Temperature: 250 °C.

Detector Temperature: 305 °C.

Oven Temperature: 30 °C for 4 min; programmed to rise at 40 °C/min until it reaches 250 °C; return to 30 °C after 17 minutes.

Compare the results of the analysis to the results from the reference solution. Prepare the reference solution by injecting 2.5 µl of methylene chloride into 100 ml of toluene. This corresponds to 100 µg of methylene chloride per g of adsorbent. The maximum acceptable concentration is 1000 µg/g of adsorbent. If the adsorbent exceeds this level, drying must be continued until the excess methylene chloride is removed.

3.4.3.1.2.3.3 Storage. The adsorbent must be used within 4 weeks of cleaning. After cleaning, it may be stored in a wide mouth amber glass container with a Teflon-lined cap or placed in one of the glass adsorbent modules tightly sealed with glass stoppers. If precleaned adsorbent is purchased in sealed containers, it must be used within 4 weeks after the seal is broken.

3.4.3.1.3 Glass Wool. Cleaned by sequential immersion in three aliquots of methylene chloride, dried in a 110 °C oven, and stored in a methylene chloride-washed glass jar with a Teflon-lined screw cap.

3.4.3.1.4 Water. Deionized distilled and stored in a methylene chloride-rinsed glass container with a Teflon-lined screw cap.

3.4.3.1.5 Silica Gel. Indicating type, 6 to 16 mesh. If previously used, dry at 175 °C (350 °F) for two hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to the approval of the Department.

3.4.3.1.6 Chromic Acid Cleaning Solution. Dissolve 20 g of sodium dichromate in 15 ml of water, and then carefully add 400 ml of concentrated sulfuric acid.

3.4.3.2 Sample Recovery.

3.4.3.2.1 Acetone. Pesticide quality.

3.4.3.2.2 Methylene Chloride. Pesticide quality.

3.4.3.2.3 Toluene. Pesticide quality.

3.4.3.3 Analysis.

3.4.3.3.1 Potassium Hydroxide. ACS grade, 2-percent (weight/volume) in water.

3.4.3.3.2 Sodium Sulfate. Granulated, reagent grade. Purify prior to use by rinsing with methylene chloride and oven drying. Store the cleaned material in a glass container with a Teflon-lined screw cap.

3.4.3.3.3 Sulfuric Acid. Reagent grade.

3.4.3.3.4 Sodium Hydroxide. 1.0 N. Weigh 40 g of sodium hydroxide into a 1-liter volumetric flask. Dilute to 1 liter with water.

3.4.3.3.5 Hexane. Pesticide grade.

3.4.3.3.6 Methylene Chloride. Pesticide grade.

3.4.3.3.7 Benzene. Pesticide grade.

3.4.3.3.8 Ethyl Acetate.

3.4.3.3.9 Methanol. Pesticide grade.

3.4.3.3.10 Toluene. Pesticide grade.

3.4.3.3.11 Nonane. Pesticide grade.

3.4.3.3.12 Cyclohexane. Pesticide grade.

3.4.3.3.13 Basic Alumina. Activity grade 1, 100-200 mesh. Prior to use, activate the alumina by heating for 16 hours at 130 °C before use. Store in a desiccator. Pre-activated alumina may be purchased from a supplier and may be used as received.

3.4.3.3.14 Silica Gel. Bio-Sil A, 100-200 mesh. Prior to use, activate the silica gel by heating for at least 30 minutes at 180 °C. After cooling, rinse the silica gel sequentially with methanol and methylene chloride. Heat the rinsed silica gel at 50 °C for 10 minutes, and then increase the

temperature gradually to 180 °C over 25 minutes and maintain it at this temperature for 90 minutes. Cool at room temperature and store in a glass container with a Teflon-lined screw cap.

3.4.3.3.15 Silica Gel Impregnated with Sulfuric Acid. Combine 100 g of silica gel with 44 g of concentrated sulfuric acid in a screw-capped glass bottle and agitate thoroughly. Disperse the solids with a stirring rod until a uniform mixture is obtained. Store the mixture in a glass container with a Teflon-lined screw cap.

3.4.3.3.16 Silica Gel Impregnated with Sodium Hydroxide. Combine 39 g of 1 N sodium hydroxide with 100 g of silica gel in a screw-capped glass bottle and agitate thoroughly. Disperse solids with a stirring rod until a uniform mixture is obtained. Store the mixture in a glass container with a Teflon-lined screw cap.

3.4.3.3.17 Carbon/Celite. Combine 10.7 g of AX-21 carbon with 124 g of Celite 545 in a 250-ml glass bottle with a Teflon-lined screw cap. Agitate the mixture thoroughly until a uniform mixture is obtained. Store in the glass container.

3.4.3.3.18 Nitrogen. Ultra high purity.

3.4.3.3.19 Hydrogen. Ultra high purity.

3.4.3.3.20 Internal Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 3.4-1 under the heading "Internal Standards" in 10 ml of nonane.

3.4.3.3.21 Surrogate Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 1 under the heading "Surrogate Standards" in 10 ml of nonane.

3.4.3.3.22 Recovery Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 1 under the heading "Recovery Standards" in 10 ml of nonane.

Table 3.4-1.—Composition of the Sample Fortification and Recovery Standards Solutions

Analyte	Concentration (pg/μl)
Internal Standards:	
¹³ C ₁₂ -2,3,7,8-TCDD	100
¹³ C ₁₂ -1,2,3,7,8-PeCCD	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDD	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDD	100
¹³ C ₁₂ -2,3,7,8-TCDF	100
¹³ C ₁₂ -1,2,3,7,8-PeCDF	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDF	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDF	100
Surrogate Standards:	
³⁷ C ₁₄ -2,3,7,8-TCDD	100
¹³ C ₁₂ -1,2,3,4,7,8-HxCDD	100
¹³ C ₁₂ -2,3,4,7,8-PeCDF	100
¹³ C ₁₂ -1,2,3,4,7,8-HxCDF	100
¹³ C ₁₂ -1,2,3,4,7,8,9-HpCDF	100
Recovery Standards:	

Analyte	Concentration (pg/μl)
¹³ C ₁₂ -1,2,3,4-TCDD	500
¹³ C ₁₂ -1,2,3,7,8,9-HxCDD	500

3.4.4 Procedure

3.4.4.1 Sampling. The complexity of this method is such that, in order to obtain reliable results, analysts should be trained and experienced with the analytical procedures.

3.4.4.1.1 Preparation Prior to Analysis.

3.4.4.1.1.1 Cleaning Glassware. All glass components of the train upstream of and including the adsorbent module, shall be cleaned as described in Section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples." Special care shall be devoted to the removal of residual silicone grease sealants on ground glass connections of used glassware. Any residue shall be removed by soaking the glassware for several hours in a chromic acid cleaning solution prior to cleaning as described above.

3.4.4.1.1.2 Adsorbent Trap. The traps must be loaded in a clean area to avoid contamination. They may not be loaded in the field. Fill a trap with 20 to 40 g of XAD-2. Follow the XAD-2 with glass wool and tightly cap both ends of the trap. Add 100 μl of the surrogate standard solution (Section 3.4.3.3.21) to each trap.

3.4.4.1.1.3 Sample Train. It is suggested that all components be maintained according to the procedure described in APTD-0576.

3.4.4.1.1.4 Silica Gel. Weigh several 200 to 300 g portions of silica gel in an air-tight container to the nearest 0.5 g. Record the total weight of the silica gel plus container, on each container. As an alternative, the silica gel may be weighed directly in its impinger or sample holder just prior to sampling.

3.4.4.1.1.5 Filter. Check each filter against light for irregularities and flaws or pinhole leaks. Pack the filters flat in a clean glass container.

3.4.4.1.2 Preliminary Determinations. Same as Section 4.1.2 of Method 5.

3.4.4.1.3 Preparation of Collection Train.

3.4.4.1.3.1 During preparation and assembly of the sampling train, keep all train openings where contamination can enter, sealed until just prior to assembly or until sampling is about to begin.

Note: Do not use sealant grease in assembling the train.

3.4.4.1.3.2 Place approximately 100 ml of water in the second and third impingers, leave the first and fourth impingers empty, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the fifth impinger.

3.4.4.1.3.3 Place the silica gel container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

3.4.4.1.3.4 Assemble the train as shown in Figure 3.4-1.

3.4.4.1.3.5 Turn on the adsorbent module and condenser coil recirculating pump and begin monitoring the adsorbent module gas entry temperature. Ensure proper sorbent temperature gas entry temperature before proceeding and before sampling is initiated. It is extremely important that the XAD-2 adsorbent resin temperature never exceed 50 °C because thermal decomposition will occur. During testing, the XAD-2 temperature must not exceed 20 °C for efficient capture of the PCDDs and PCDFs.

3.4.4.1.4 Leak-Check Procedure. Same as method 5, section 4.1.4.

3.4.4.1.5 Sample Train Operation. Same as method 5, section 4.1.5.

3.4.4.2 Sample Recovery. Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Seal the nozzle end of the sampling probe with Teflon tape or aluminum foil.

When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe. Remove the probe from the train and close off both ends with aluminum foil. Seal off the inlet to the train with Teflon tape, a ground glass cap, or aluminum foil.

Transfer the probe and impinger assembly to the cleanup area. This area shall be clean and enclosed so that the chances of losing or contaminating the sample are minimized. Smoking, which could contaminate the sample, shall not be allowed in the cleanup area.

Inspect the train prior to and during disassembly and note any abnormal conditions, e.g., broken filters, colored impinger liquid, etc. Treat the samples as follows:

3.4.4.2.1 Container No. 1. Either seal the filter holder or carefully remove the filter from the filter holder and place it in its identified container. Use a pair of cleaned tweezers to handle the filter. If it is necessary to fold the filter, do so such that the particulate cake is inside the fold. Carefully transfer to the container any particulate matter and filter fibers which adhere to the filter holder gasket, by using a dry inert bristle brush and a sharp-edged blade. Seal the container.

3.4.4.2.2 Adsorbent Module. Remove the module from the train, tightly cap both ends, label it, cover with aluminum foil, and store it on ice for transport to the laboratory.

3.4.4.2.3 Container No. 2. Quantitatively recover material deposited in the nozzle, probe transfer lines, the front half of the filter holder, and the cyclone, if used, first, by brushing while rinsing three times each with acetone, and then by rinsing the probe three times with methylene chloride. Collect all the rinses in Container No. 2.

Rinse the back half of the filter holder three times with acetone. Rinse the connecting line between the filter and the condenser three times with acetone. Soak the connecting line with three separate portions of methylene chloride for 5 minutes each. If using a separate condenser and adsorbent trap, rinse the condenser in the same manner as the connecting line. Collect all the rinses in Container No. 2 and mark the level of the liquid on the container.

3.4.4.2.4 Container No. 3. Repeat the methylene chloride-rinsing described in section 3.4.4.2.3 using toluene as the rinse solvent. Collect the rinses in Container No. 3 and mark the level of the liquid on the container.

3.4.4.2.5 Impinger Water. Measure the liquid in the first three impingers to within ± 1 ml by using a graduated cylinder or by weighing it to within ± 0.5 g by using a balance. Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas.

Discard the liquid after measuring and recording the volume or weight.

3.4.4.2.6 Silica Gel. Note the color of the indicating silica gel to determine if it has been completely spent and make a mention of its condition. Transfer the silica gel from the fifth impinger to its original container and seal.

3.4.5 Analysis

All glassware shall be cleaned as described in section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples." All samples must be extracted within 30 days of collection and analyzed within 45 days of extraction.

3.4.5.1 Sample Extraction.

3.4.5.1.1 Extraction System. Place an extractable thimble (section 3.4.2.3.4), 1 g of silica gel, and a plug of glass wool into the Soxhlet apparatus, charge the apparatus with toluene, and reflux for a minimum of 3 hours. Remove the toluene and discard it, but retain the silica gel. Remove the extraction thimble from the extraction system and place it in a glass beaker to catch the solvent rinses.

3.4.5.1.2 Container No. 1 (Filter). Transfer the contents of container number 1 directly to the glass thimble of the extraction system and extract them simultaneously with the XAD-2 resin.

3.4.5.1.3 Adsorbent Module. Suspend the adsorbent module directly over the extraction thimble in the beaker (see section 3.4.5.1.1). The glass frit of the module should be in the up position. Using a Teflon squeeze bottle containing toluene, flush the XAD-2 into the thimble

onto the bed of cleaned silica gel. Thoroughly rinse the glass module catching the rinsings in the beaker containing the thimble. If the resin is wet, effective extraction can be accomplished by loosely packing the resin in the thimble. Add the XAD-2 glass wool plug to the thimble.

3.4.5.1.4 Container No. 2 (Acetone and Methylene Chloride Rinse). Concentrate the sample to a volume of about 1–5 ml using the rotary evaporator apparatus, at a temperature of less than 37 °C. Rinse the sample container three times with small portions of methylene chloride and add these to the concentrated solution and concentrate further to near dryness. This residue contains particulate matter removed in the rinse of the train probe and nozzle. Add the concentrate to the filter and the XAD-2 resin in the Soxhlet apparatus described in section 3.4.5.1.1.

3.4.5.1.5 Extraction. Add 100 μ l of the internal standard solution (section 3.4.3.3.20) to the extraction thimble containing the contents of the adsorbent cartridge, the contents of Container No. 1, and the concentrate from section 3.4.5.1.3. Cover the contents of the extraction thimble with the cleaned glass wool plug to prevent the XAD-2 resin from floating into the solvent reservoir of the extractor. Place the thimble in the extractor, and add the toluene contained in the beaker to the solvent reservoir. Pour additional toluene to fill the reservoir approximately $\frac{2}{3}$ full. Add Teflon boiling chips and assemble the apparatus. Adjust the heat source to cause the extractor to cycle three times per hour. Extract the sample for 16 hours. After extraction, allow the Soxhlet to cool. Transfer the toluene extract and three 10-ml rinses to the rotary evaporator. Concentrate the extract to approximately 10 ml. At this point the analyst may choose to split the sample in half. If so, split the sample, store one half for future use, and analyze the other according to the procedures in sections 3.4.5.2 and 3.4.5.3. In either case, use a nitrogen evaporative concentrator to reduce the volume of the sample being analyzed to near dryness. Dissolve the residue in 5 ml of hexane.

3.4.5.1.6 Container No. 3 (Toluene Rinse). Add 100 μ l of the Internal Standard solution (section 3.4.3.3.20) to the contents of the container. Concentrate the sample to a volume of about 1-5 ml using the rotary evaporator apparatus at a temperature of less than 37 °C. Rinse the sample container three times with small portions of toluene and add these to the concentrated solution and concentrate further to near dryness. Analyze the extract separately according to the procedures in sections 3.4.5.2 and 3.4.5.3, but concentrate the solution in a rotary evaporator apparatus rather than a nitrogen evaporative concentrator.

3.4.5.2 Sample Cleanup and Fractionation.

3.4.5.2.1 Silica Gel Column. Pack one end of a glass column, 20 mm \times 230 mm, with glass wool. Add in sequence, 1 g silica gel, 2 g of sodium hydroxide impregnated silica gel, 1 g silica gel, 4 g of acid-modified silica gel, and 1 g of silica gel. Wash the column with 30 ml of hexane and discard it. Add the sample extract, dissolved in 5 ml of hexane to the column with two additional 5-ml rinses. Elute the column with an additional 90 ml of hexane and retain the entire eluate. Concentrate this solution to a volume of about 1 ml using the nitrogen evaporative concentrator (section 3.4.2.3.8).

3.4.5.2.2 Basic Alumina Column. Shorten a 25-ml disposable Pasteur pipette to about 16 ml. Pack the lower section with glass wool and 12 g of basic alumina. Transfer the concentrated extract from the silica gel column to the top of the basic alumina column and elute the column sequentially with 120 ml of 0.5 percent methylene chloride in hexane followed by 120 ml of 35 percent methylene chloride in hexane. Discard the first 120 ml of eluate. Collect the second 120 ml of eluate and concentrate it to about 0.5 ml using the nitrogen evaporative concentrator.

3.4.5.2.3 AX-21 Carbon/Celite 545 Column. Remove the bottom 0.5 in. from the tip of a 9-ml disposable Pasteur pipette. Insert a glass fiber filter disk in the top of the pipette 2.5 cm from the constriction. Add sufficient carbon/celite mixture to form a 2 cm column. Top with a glass wool plug. In some cases, AX-21 carbon fines may wash through the glass wool plug and enter the sample. This may be prevented by adding a celite plug to the exit end of the column. Rinse the column in sequence with 2 ml of 50 percent benzene in ethyl acetate, 1 ml of 50 percent methylene chloride in cyclohexane, and 2 ml of hexane. Discard these rinses. Transfer the concentrate in 1 ml of hexane from the basic alumina column to the carbon/celite column along with 1 ml of hexane rinse. Elute the column sequentially with 2 ml of 50 percent methylene chloride in hexane and 2 ml of 50 percent benzene in ethyl acetate and discard these

eluates. Invert the column and elute in the reverse direction with 13 ml of toluene. Collect this eluate. Concentrate the eluate in a rotary evaporator at 50 °C to about 1 ml. Transfer the concentrate to a Reacti-vial using a toluene rinse and concentrate to a volume of 200 μ l using a stream of N₂. Store extracts at room temperature, shielded from light, until the analysis is performed.

3.4.5.3 Analysis. Analyze the sample with a gas chromatograph coupled to a mass spectrometer (GC/MS) using the instrumental parameters in sections 3.4.5.3.1 and 3.4.5.3.2. Immediately prior to analysis, add a 20- μ l aliquot of the Recovery Standard solution from Table 1 to each sample. A 2- μ l aliquot of the extract is injected into the GC. Sample extracts are first analyzed using the DB-5 capillary column to determine the concentration of each isomer of PCDDs and PCDFs (tetra-through octa-). If tetra-chlorinated dibenzofurans are detected in this analysis, then analyze another aliquot of the sample in a separate run, using the DB-225 column to measure the 2,3,7,8-tetrachlorodibenzofuran isomer. Other column systems may be used, provided that the user is able to demonstrate, using calibration and performance checks, that the column system is able to meet the specifications of Section 3.4.6.1.2.2.

3.4.5.3.1 Gas Chromatograph Operating Conditions.

3.4.5.3.1.1 Injector. Configured for capillary column, splitless, 250 °C.

3.4.5.3.1.2 Carrier Gas. Helium, 1–2 ml/min.

3.4.5.3.1.3 Oven. Initially at 150 °C. Raise by at least 40 °C/min to 190 °C and then at 3 °C/min up to 300 °C.

3.4.5.3.2 High Resolution Mass Spectrometer.

3.4.5.3.2.1 Resolution. 10000 m/e.

3.4.5.3.2.2 Ionization Mode. Electron impact.

3.4.5.3.2.3 Source Temperature 250 °C.

3.4.5.3.2.4 Monitoring Mode. Selected ion monitoring. A list of the various ions to be monitored is summarized in Table 3.4-2.

Table 3-4-2.—Elemental Compositions and Exact Masses of the Ions Monitored by High Resolutions Mass Spectrometry for PCDD's and PCDF's

Descriptor no.	Accurate mass ^a	Ion type	Elemental composition	Analyte
1	[Not used]			
2	292.9825	LOCK	C ₇ F ₁₁	PFK
	303.9016	M	C ₁₂ H ₄ ³⁶ Cl ₄ O	TCDF
	305.8987	M + 2	C ₁₂ H ₄ ³⁶ Cl ₃ ³⁷ O	TCDF
	315.9419	M	¹³ C ₁₂ H ₄ ³⁶ Cl ₄ O	TCDF (S)
	317.9389	M + 2	¹³ C ₁₂ H ₄ ³⁶ Cl ₃ ³⁷ ClO	TCDF (S)
	319.8965	M	C ₁₂ H ₄ ³⁶ ClO ₂	TCDD
	321.8936	M + 2	C ₁₂ H ₄ ³⁶ Cl ₃ ³⁷ ClO ₂	TCDD
	327.8847	M	C ₁₂ H ₄ ³⁷ Cl ₄ O ₂	TCDD (S)
	330.9792	QC	C ₇ F ₁₃	PFK
	331.9368	M	¹³ C ₁₂ H ₄ ³⁶ Cl ₄ O ₂	TCDD (S)
	333.9339	M + 2	¹³ C ₁₂ H ₄ ³⁵ Cl ₃ ³⁷ ClO ₂	TCDD (S)
	339.8597	M + 2	C ₁₂ H ₃ ³⁶ Cl ₄ ³⁷ ClO	PeCDF
	341.8567	M + 4	C ₁₂ H ₄ ³⁶ Cl ₃ ³⁷ Cl ₂ O	PeCDF
	351.9000	M + 2	¹³ C ₁₂ H ₃ ³⁶ Cl ₄ ³⁷ ClO	PeCDF (S)
	353.8970	M + 4	¹³ C ₁₂ H ₃ ³⁶ Cl ₃ ³⁷ Cl ₂ O	PeCDF (S)
	355.8546	M + 2	C ₁₂ H ₃ ³⁶ Cl ₃ ³⁷ ClO ₂	PeCDD
	357.8516	M + 4	C ₁₂ H ₃ ³⁶ Cl ₃ ³⁷ Cl ₂ O ₂	PeCDD
367.8949	M + 2	¹³ C ₁₂ H ₃ ³⁶ Cl ₄ ³⁷ ClO ₂	PeCDD (S)	
369.8919	M + 4	¹³ C ₁₂ H ₃ ³⁶ Cl ₃ ³⁷ ClO ₂	PeCDD (S)	
375.8364	M + 2	C ₁₂ H ₄ ³⁶ Cl ₃ ³⁷ ClO	HxCDFE	
409.7974	M + 2	C ₁₂ H ₃ ³⁶ Cl ₆ ³⁷ ClO	HpCPDE	
3	373.8208	M + 2	C ₁₂ H ₂ ³⁶ Cl ₆ ³⁷ ClO	HxCDF

Descriptor no.	Accurate mass ^a	Ion type	Elemental composition	Analyte
	375.8178	M + 4	C ₁₂ H ₃₃₆ Cl ₄ ³⁷ Cl ₂ O	HxCDF
	383.8639	M	¹³ C ₁₂ H ₃₃₆ Cl ₆ O	HxCDF (S)
	385.8610	M + 2	¹³ C ₁₂ H ₂₃₆ Cl ₆ ³⁷ ClO	HxCDF (S)
	389.8157	M + 2	C ₁₂ H ₂₃₆ Cl ₆ ³⁷ ClO ₂	HxCDD
	391.8127	M + 4	C ₁₂ H ₂₃₆ Cl ₄ ³⁷ Cl ₂ O ₂	HxCDD
	392.9760	LOCK	C ₉ F ₁₅	PFK
	401.8559	M + 2	¹³ C ₁₂ H ₂₃₆ Cl ₆ ³⁷ ClO ₂	HxCDD (S)
	403.8529	M + 4	¹³ C ₁₂ H ₂₃₆ Cl ₄ ³⁷ Cl ₂ O	HxCDD (S)
	445.7555	M + 4	C ₁₂ H ₂₃₆ Cl ₈ ³⁷ Cl ₂ O	OCDF
	430.9729	QC	C ₉ F ₁₇	PFK
4	407.7818	M + 2	C ₁₂ H ³⁶ Cl ₈ ³⁷ ClO	HpCDF
	409.7789	M + 4	C ₁₂ H ³⁶ Cl ₈ ³⁷ Cl ₂ O	HpCDF
	417.8253	M	¹³ C ₁₂ H ₃₆ Cl ₇ O	HpCDF (S)
	419.8220	M + 2	¹³ C ₁₂ H ₃₆ Cl ₈ ³⁷ ClO	HpCDF (S)
	423.7766	M + 2	C ₁₂ H ₃₆ Cl ₆ ³⁷ ClO ₂	HpCDD
	425.7737	M + 4	C ₁₂ H ₃₆ C ₆ ³⁷ Cl ₂ O ₂	HpCDD
	435.8169	M + 2	¹³ C ₁₂ H ₃₆ Cl ₈ ³⁷ ClO ₂	HpCDD (S)
	437.8140	M + 4	¹³ C ₁₂ H ₃₆ Cl ₆ ³⁷ Cl ₂ O ₂	HpCDD (S)
	479.7165	M + 4	C ₁₂ H ₃₆ Cl ₇ ³⁷ Cl ₂ O	NCPDE
	430.9729	LOCK	C ₉ F ₁₇	PFK
	441.7428	M + 2	C ₁₂₃₆ Cl ₇ ³⁷ ClO	OCDF
	443.7399	M + 4	C ₁₂₃₆ Cl ₈ ³⁷ Cl ₂ O	OCDF
	457.7377	M + 2	C ₁₂₃₆ Cl ₇ ³⁷ ClO ₂	OCDD
	459.7348	M + 4	C ₁₂₃₆ Cl ₆ ³⁷ Cl ₂ O ₂	OCDD
	469.7779	M + 2	¹³ C ₁₂₃₆ Cl ₇ ³⁷ ClO ₂	OCDD (S)
	471.7750	M + 4	¹³ C ₁₂₃₆ Cl ₆ ³⁷ Cl ₂ O ₂	OCDD (S)
	513.6775	M + 4	C ₁₂₃₆ Cl ₉ ³⁷ Cl ₂ O ₂	DCDFE
	442.9728	QC	C ₁₀ F ₁₇	PFK

^a The following nuclidic masses were used: H = 1.007825, O = 15.994915, C = 12.000000, ³⁶Cl = 34.968853,

¹³C = 13.003355, ³⁷Cl = 36.965903, F = 18.9984, S = Labeled Standard, QC = Ion selected for monitoring instrument stability during the GC/MS analysis.

Table 3.4-3.—Acceptable Ranges for Ion-Abundance Ratios of PCDD's and PCDF's

Number of Chlorine atoms	Ion type	Theoretical ratio	Control Limits	
			Lower	Upper
4	M/M + 2	0.77	0.65	0.89
5	M + 2/M + 4	1.55	1.32	1.78
6	M + 2/M + 4	1.24	1.05	1.43
6 ^a	M/M + 2	0.51	0.43	0.59
7 ^b	M/M + 2	0.44	0.37	0.51
7	M + 2/M + 4	1.04	0.88	1.20
8	M + 2/M + 4	0.89	0.76	1.02

^a Used only for ¹³C-HxCDF

^b Used only for ¹³C-HpCDF

3.4.5.3.2.5 Identification Criteria. The following identification criteria shall be used for the characterization of polychlorinated dibenzodioxins and dibenzofurans.

1. The integrated ion-abundance ratio (M/M + 2 or M + 2/M + 4) shall be within 15 percent of the theoretical value. The acceptable ion-abundance ratio ranges for the identification of chlorine-containing compounds are given in Table 3.

2. The retention time for the analytes must be within 3 seconds of the corresponding ¹³C-labeled internal standard, surrogate or alternate standard.

3. The monitored ions, shown in Table 3.4-2 for a given analyte, shall reach their maximum within 2 seconds of each other.

4. The identification of specific isomers that do not have corresponding ¹³C-labeled standards is done by comparison of the relative retention time (RRT) of the analyte to the nearest internal standard retention time with reference (i.e., within 0.005 RRT units) to the comparable RRTs found in the continuing calibration.

5. The signal to noise ratio for all monitored ions must be greater than 2.5.

6. The confirmation of 2,3,7,8-TCDD and 2,3,7,8-TCDF shall satisfy all of the above identification criteria.

7. For the identification of PCDFs, no signal may be found in the corresponding PCDF channels.

3.4.5.3.2.6 Quantitation. The peak areas for the two ions monitored for each analyte are summed to yield the total response for each analyte. Each internal standard is used to quantitate the indigenous PCDDs or PCDFs in its homologous series. For example, the ¹³C₁₂-2,3,7,8-tetrachlorodibenzodioxin is used to calculate the concentrations of all other tetrachlorinated isomers. Recoveries of the tetra- and penta-internal standards are calculated using the ¹³C₁₂-1,2,3,4-TCDD. Recoveries of the hexa- through octa-internal standards are calculated using ¹³C₁₂-1,2,3,7,8,9-HxCDD. Recoveries of the surrogate standards are calculated using the corresponding homolog from the internal standard.

3.4.6 Calibration

Same as Method 5 with the following additions.

3.4.6.1 GC/MS System.

3.4.6.1.1 Initial Calibration. Calibrate the GC/MS system using the set of five standards shown in Table 3.4-4. The relative standard deviation for the mean response factor from each of the unlabeled analytes (Table 4) and of the internal, surrogate, and alternate standards shall be less than or equal to the values in Table 3.4-5. The signal to noise ratio for the GC signal present in every selected ion current profile shall be greater than or equal to 2.5. The ion abundance ratios shall be within the control limits in Table 3.4-3.

3.4.6.1.2 Daily Performance Check.

3.4.6.1.2.1 Calibration Check. Inject one μ l of solution Number 3 from table 4. Calculate the relative response factor (RRF) for each compound and compare each RRF to the corresponding mean RRF obtained during the initial calibration. The analyzer performance is acceptable if the measured RRFs for the labeled and unlabeled compounds for the daily run are within the limits of the mean values shown in Table 3.4-5. In addition, the ion-abundance ratios shall be within the allowable control limits shown in Table 3.4-3.

3.4.6.1.2.2 Column Separation Check. Inject a solution of a mixture of PCDDs and PCDFs that documents resolution between 2,3,7,8-TCDD and other TCDD isomers. Resolution is defined as a valley between peaks that is less than 25 percent of the lower of the two peaks. Identify and record the retention time windows for each homologous series.

Table 3.4-4.—Composition of the Initial Calibration Solutions.

Compound	Relative Response Factors	
	Initial Calibration RSD	Daily Calibration % Difference
Unlabeled Analytes		
2, 3, 7, 8-TCDD	25	25
1, 2, 3, 7, 8-PeCDD	25	25
1, 2, 3, 7, 8-PeCDF	25	25
2, 3, 4, 7, 8-PeCDF	25	25
1, 2, 4, 5, 7, 8-HxCDD	25	25
1, 2, 3, 6, 7, 8-HxCDD	25	25
1, 2, 3, 7, 8, 9-HxCDD	25	25
1, 2, 3, 4, 7, 8-HxCDF	25	25
1, 2, 3, 6, 7, 8-HxCDF	25	25

Compound	Relative Response Factors	
	Initial Calibration RSD	Daily Calibration % Difference
1, 2, 3, 7, 8, 9-HxCDF	25	25
2, 3, 4, 6, 7, 8-HxCDF	25	25
1, 2, 3, 4, 6, 7, 8-HpCDD	25	25
1, 2, 3, 4, 6, 7, 8-HpCDF	25	25
OCDD	25	25
OCDF	30	30
Internal Standards		
¹³ C ₁₂ -2, 3, 7, 8-TCDD	25	25
¹³ C ₁₂ -1, 2, 3, 7, 8-PeCCD	30	30
¹³ C ₁₂ -1, 2, 3, 6, 7, 8-HxCDD	25	25
¹³ C ₁₂ -1, 2, 3, 4, 6, 7, 8-HpCDD	30	30
¹³ C ₁₂ -OCDD	30	30
¹³ C ₁₂ -2, 3, 7, 8-TCDF	30	30
¹³ C ₁₂ -1, 2, 3, 7, 8-PeCDF	30	30
¹³ C ₁₂ -1, 2, 3, 6, 7, 8-HxCDF	30	30
¹³ C ₁₂ -1, 2, 3, 4, 6, 7, 8-HpCDF	30	30
Surrogate Standards		
¹³ Cl ₄ -2, 3, 7, 8-TCDD	25	25
¹³ C ₁₂ -2, 3, 4, 7, 8-PeCDF	25	25
¹³ C ₁₂ -1, 2, 3, 4, 7, 8-HxCDD	25	25
¹³ C ₁₂ -1, 2, 3, 4, 7, 8-HxCDF	25	25
¹³ C ₁₂ -1, 2, 3, 4, 7, 8, 9-HpCDF	25	25
Alternate Standard		
¹³ C ₁₂ -1, 2, 3, 7, 8, 9-HxCDF	25	25

Table 3.4-5.—Minimum Requirements for Initial and Daily Calibration Response Factors

Compound	Solution No.	Concentrations (pg/μL)			
		1	2	3	4
Unlabeled Analytes					
2,3,7,8-TCDD	0.5	1	5	50	100
2,3,7,8-TCDF	0.5	1	5	50	100
1,2,3,7,8-PeCDD	2.5	5	25	250	500
1,2,3,7,8-PeCDF	2.5	5	25	250	500
2,3,4,7,8-PeCDF	2.5	5	25	250	500
1,2,3,4,7,8-HxCDD	2.5	5	25	250	500
1,2,3,6,7,8-HxCDD	2.5	5	25	250	500
1,2,3,7,8,9-HxCDD	2.5	5	25	250	500
1,2,3,4,7,8-HxCDF	2.5	5	25	250	500
1,2,3,6,7,8-HxCDF	2.5	5	25	250	500
1,2,3,7,8,9-HxCDF	2.5	5	25	250	500
2,3,4,6,7,8-HxCDD	2.5	5	25	250	500
1,2,3,4,6,7,8-HpCDD	2.5	5	25	250	500
1,2,3,4,6,7,8-HpCDF	2.5	5	25	250	500
1,2,3,4,7,8,9-HpCDF	2.5	5	25	250	500
OCDD	5.0	10	50	500	1000
OCDF	5.0	10	50	500	1000
Internal Standards					
¹³ C ₁₂ -2,3,7,8-TCDD	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8-PeCDD	100	100	100	100	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDD	100	100	100	100	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDD	100	100	100	100	100
¹³ C ₁₂ -OCDD	200	200	200	200	200
¹³ C ₁₂ -2,3,7,8-TCDF	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8-PeCDF	100	100	100	100	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDF	100	100	100	100	100

Compound	Solution No.	Concentrations (pg/μL)			
		1	2	3	4
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDF	100	100	100	100	100
Surrogate Standards					
³⁷ Cl ₄ -2,3,7,8-TCDD	0.5	1	5	50	100
¹³ C ₁₂ -2,3,4,7,8-PeCDF	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8-HxCDD	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8-HxCDF	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8,9-HpCDF	2.5	5	25	250	500
Alternative Standard					
¹³ C ₁₂ -1,2,3,7,8,9-HxCDF	2.5	5	25	250	500
Recovery Standards					
¹³ C ₁₂ -1,2,3,4-TCDD	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8,9-HxCDD	100	100	100	100	100

Perform a similar resolution check on the confirmation column to document the resolution between 2,3,7,8-TCDF and other TCDF isomers.

3.4.6.2 Lock Channels. Set mass spectrometer lock channels as specified in Table 3.4-3. Monitor the quality control check channels specified in Table 3.4-3 to verify instrument stability during the analysis.

3.4.7 Quality Control

3.4.7.1 Sampling Train Collection Efficiency Check. Add 100 μ l of the surrogate standards in Table 3.4-1 to the adsorbent cartridge of each train before collecting the field samples.

3.4.7.2 Internal Standard Percent Recoveries. A group of nine carbon-labeled PCDDs and PCDFs representing the tetra-through octachlorinated homologues, is added to every sample prior to extraction. The role of the internal standards is to quantitate the native PCDDs and PCDFs present in the sample as well as to determine the overall method efficiency. Recoveries of the internal standards must be between 40 to 130 percent for the tetra-through hexachlorinated compounds while the range is 25 to 130 percent for the higher hepta- and octachlorinated homologues.

3.4.7.3 Surrogate Recoveries. The five surrogate compounds in Table 3.4-4 are added to the resin the adsorbent sampling cartridge before the sample is collected. The surrogate recoveries are measured relative to the internal standards and are a measure of collection efficiency. They are not used to measure native PCDDs and PCDFs. All recoveries shall be between 70 and 130 percent. Poor recoveries for all the surrogates may be an indication of breakthrough in the sampling train. If the recovery of all standards is below 70 percent, the sampling runs must be repeated. As an alternative, the sampling runs do not have to be repeated if the final results are divided by the fraction of surrogate recovery. Poor recoveries of isolated surrogate compounds should not be grounds for rejecting an entire set of samples.

3.4.7.4 Toluene QA Rinse. Report the results of the toluene QA rinse separately from the total sample catch. Do not add it to the total sample.

3.4.8 Quality Assurance

3.4.8.1 Applicability. When the method is used to analyze samples to demonstrate compliance with a source emission regulation, an audit sample must be analyzed, subject to availability.

3.4.8.2 Audit Procedure. Analyze an audit sample with each set of compliance samples. The audit sample contains tetra through octa isomers of PCDD and PCDF. Concurrently, analyze the audit sample and a set of compliance samples in the same manner to evaluate the technique of the analyst and the standards preparation. The same analyst, analytical reagents, and analytical system shall be used both for the compliance samples and the audit sample.

3.4.8.3 Audit Sample Availability. Audit samples will be supplied only to enforcement agencies for compliance tests. The availability of audit samples may be obtained by calling the Source Test Audit Coordinator (STAC) at (919) 541-7834. The request for the audit sample must be made at least 30 days prior to the scheduled compliance sample analysis.

3.4.8.4 Audit Results. Calculate the audit sample concentration according to the calculation procedure described in the audit instructions included with the audit sample. Fill in the audit sample concentration and the analyst's name on the audit response form included with the audit

instructions. Send one copy to the South Carolina Department of Health and Environmental Control and a second copy to the STAC. The Department will report the results of the audit to the laboratory being audited. Include this response with the results of the compliance samples in relevant reports to the Department.

3.4.9 Calculations

Same as method 5, section 6 with the following additions.

3.4.9.1 Nomenclature.

A_{AI} = Integrated ion current of the noise at the retention time of the analyte.

A^*_{CI} = Integrated ion current of the two ions characteristic of the internal standard i in the calibration standard.

A_{CIj} = Integrated ion current of the two ions characteristic of compound i in the j th calibration standard.

A^*_{CIj} = Integrated ion current of the two ions characteristic of the internal standard i in the j th calibration standard.

A_{CSI} = Integrated ion current of the two ions characteristic of surrogate compound i in the calibration standard.

A_I = Integrated ion current of the two ions characteristic of compound in the sample.

A^*_I = Integrated ion current of the two ions characteristic of internal standard i in the sample.

A_{RS} = Integrated ion current of the two ions characteristic of the recovery standard.

A_{SI} = Integrated ion current of the two ions characteristic of surrogate compound i in the sample.

C_I = Concentration of PCDD or PCDF i in the sample, pg/M³.

C_T = Total concentration of PCDDs or PCDFs in the sample, pg/M³.

m_{CI} = Mass of compound i in the calibration standard injected into the analyzer, pg.

m^*_{CI} = Mass of labeled compound i in the calibration standard injected into the analyzer, pg.

m^*_I = Mass of internal standard i added to the sample, pg.

m_{RS} = Mass of recovery standard in the calibration standard injected into the analyzer, pg.

m_{SI} = Mass of surrogate compound i in the calibration standard, pg.

RRF_I = Relative response factor.

RRF_{RS} = Recovery standard response factor.

RRF_S = Surrogate compound response factor.

3.4.9.2 Average Relative Response Factor.

$$RRF_i = 1/n \sum_{j=1}^n [A_{CIj}m^*_{CI} / (A^*_{CIj}m_{CI})] \quad \text{Eq. 23-1}$$

3.4.9.3 Concentration of the PCDDs and PCDFs.

$$C_i = m^*_I A_i / (A^*_I RRF_i V_{m(std)}) \quad \text{Eq. 23-2}$$

3.4.9.4 Recovery Standard Response Factor.

$$RRF_{rs} = A^*_{CI} m_{rs} / (A_{rs} m^*_{CI}) \quad \text{Eq. 23-3}$$

3.4.9.5 Recovery of Internal Standards (R*).

$$R^* = (A^*_I m_{rs} / A_{rs} RRF_{rs} m^*_I) \times 100\% \quad \text{Eq. 23-4}$$

3.4.9.6 Surrogate Compound Response Factor.

$$RRF_s = A_{ci}^* m_{si} / (A_{csi} m_{ci}^*) \quad \text{Eq. 23-5}$$

3.4.9.7 Recovery of Surrogate Compounds (R_s).

$$R_s = (A_s m_i^* / A_i^* RRF_s m_s) \times 100\% \quad \text{Eq. 23-6}$$

3.4.9.8 Minimum Detectable Limit (MDL).

$$MDL = 2.5 A_{si} m_i^* / (A_{ci}^* RRF_i) \quad \text{Eq. 23-7}$$

3.4.9.9 Total Concentration of PCDDs and PCDFs in the Sample.

$$C_T = \sum_{i=1}^n C_i \quad \text{Eq. 23-85}$$

3.4.10 Bibliography

1. American Society of Mechanical Engineers. Sampling for the Determination of Chlorinated Organic Compounds in Stack Emissions. Prepared for U.S. Department of Energy and U.S. Environmental Protection Agency. Washington, DC December 1984. 25 p.
2. American Society of Mechanical Engineers. Analytical Procedures to Assay Stack Effluent Samples and Residual Combustion Products for Polychlorinated Dibenzo-p-Dioxins (PCDD) and Polychlorinated Dibenzofurans (PCDF). Prepared for the U.S. Department of Energy and U.S. Environmental Protection Agency. Washington, DC December 1984. 23 p.
3. Thompson, J.R. (ed.) Analysis of Pesticide Residues in Human and Environmental Samples. U.S. Environmental Protection Agency. Research Triangle Park, NC 1974.
4. Triangle Laboratories. Case Study: Analysis of Samples for the Presence of Tetra Through Octachloro-p-Dibenzodioxins and Dibenzofurans. Research Triangle Park, NC 1988. 26 p.
5. U.S. Environmental Protection Agency. Draft Method 8290-The Analysis of Polychlorinated Dibenzo-p-dioxin and Polychlorinated Dibenzofurans by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry. In: Test Methods for Evaluating Solid Waste. Washington, DC SW-846.

3.5 Sampling for Aldehyde and Ketone Emissions from Stationary Sources (Method 0011)

3.5.1 Scope and Application

This method is applicable to the determination of Destruction and Removal Efficiency (DRE) of formaldehyde, CAS Registry number 50-00-0, and possibly other aldehydes and ketones from stationary sources as specified in the regulations. The methodology has been applied specifically to formaldehyde; however, many laboratories have extended the application to other aldehydes and ketones. Compounds derivatized with 2,4-dinitrophenyl-hydrazine can be detected as low as 6.4×10^{-8} lbs/cu ft (1.8 ppbv) in stack gas over a 1 hr sampling period, sampling approximately 45 cu ft.

3.5.2 Summary of Method

3.5.2.1 Gaseous and particulate pollutants are withdrawn isokinetically from an emission source and are collected in aqueous acidic 2,4-dinitrophenyl-hydrazine. Formaldehyde present in the emissions reacts with the 2,4-dinitrophenyl-hydrazine to form the formaldehyde dinitrophenylhydrazone derivative. The dinitrophenylhydrazone derivative is extracted, solvent-exchanged, concentrated, and then analyzed by high performance liquid chromatography.

3.5.3 Interferences

3.5.3.1 A decomposition product of 2,4-dinitrophenyl-hydrazine, 2,4-dinitroaniline, can be an analytical interferant if concentrations are high. 2,4-Dinitroaniline can coelute with 2,4-dinitrophenylhydrazone of formaldehyde under high performance liquid chromatography conditions, which may be used for the analysis. High concentrations of highly-oxygenated compounds, especially acetone, that have the same retention time or nearly the same retention time as the dinitrophenylhydrazone of formaldehyde, and that also absorb at 360 nm, will interfere with the analysis.

Formaldehyde, acetone, and 2,4-dinitroaniline contamination of the aqueous acidic 2,4-dinitrophenyl-hydrazine (DNPH) reagent is frequently encountered. The reagent must be prepared within five days of use in the field and must be stored in an uncontaminated environment both before and after sampling in order to minimize blank problems. Some concentration of acetone contamination is unavoidable, because acetone is ubiquitous in laboratory and field operations. However, the acetone contamination must be minimized.

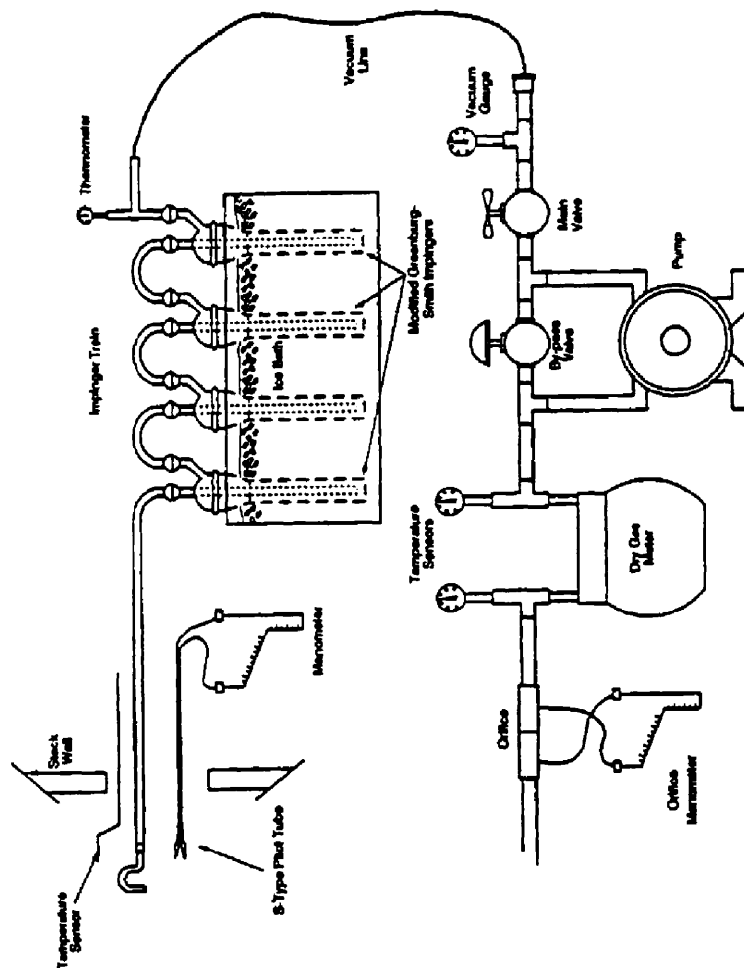
3.5.4 Apparatus and Materials

3.5.4.1 A schematic of the sampling train is shown in Figure 3.5-1. This sampling train configuration is adapted from EPA method 4 procedures. The sampling train consists of the following components: Probe Nozzle, Pitot Tube, Differential Pressure Gauge, Metering System, Barometer, and Gas Density Determination Equipment.

3.5.4.1.1 Probe Nozzle: Quartz or glass with sharp, tapered (30° angle) leading edge. The taper shall be on the outside to preserve a constant inner diameter. The nozzle shall be buttonhook or elbow design. A range of nozzle sizes suitable for isokinetic sampling should be available in increments of 0.15 cm (1/16 in), e.g., 0.32 to 1.27 cm (1/8 to 1/2 in), or larger if higher volume sampling trains are used. Each nozzle shall be calibrated according to the procedures outlined in section 3.5.8.1.

3.5.4.1.2 Probe Liner: Borosilicate glass or quartz shall be used for the probe liner. The tester should not allow the temperature in the probe to exceed 120 ± 14 °C (248 ± 25 °F).

3.5.4.1.3 Pitot Tube: The Pitot tube shall be Type S, as described in section 2.1 of EPA method 2, or any other appropriate device. The pitot tube shall be attached to the probe to allow constant monitoring of the stack gas velocity. The impact (high pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see EPA method 2, Figure 26b) during sampling. The Type S pitot tube assembly shall have a known coefficient, determined as outlined in section 4 of EPA method 2.



Formaldehyde Sampling Train

Figure 3.5-1

[Appendix IX]

3.5.4.1.4 Differential Pressure Gauge: The differential pressure gauge shall be an inclined manometer or equivalent device as described in section 2.2 of EPA method 2. One manometer shall be used for velocity-head reading and the other for orifice differential pressure readings.

3.5.4.1.5 Impingers: The sampling train requires a minimum of four impingers, connected as shown in Figure 3.5-1, with ground glass (or equivalent) vacuum-tight fittings. For the first, third, and fourth impingers, use the Greenburg-Smith design, modified by replacing the tip with a 1.3 cm inside diameter (1/2 in) glass tube extending to 1.3 cm (1/2 in) from the bottom of the flask. For the second impinger, use a Greenburg-Smith Impinger with the

standard tip. Place a thermometer capable of measuring temperature to within 1 °C (2 °F) at the outlet of the fourth impinger for monitoring purposes.

3.5.4.1.6 Metering System: The necessary components are a vacuum gauge, leak-free pump, thermometers capable of measuring temperature within 3 °C (5.4 °F), dry-gas meter capable of measuring volume to within 1%, and related equipment as shown in Figure 3.5-1. At a minimum, the pump should be capable of 4 cfm free flow, and the dry gas meter should have a recording capacity of 0–999.9 cu ft with a resolution of 0.005 cu ft. Other metering systems may be used which are capable of maintaining sample volumes to within 2%. The metering system may be used in conjunction with a pitot tube to enable checks of isokinetic sampling rates.

3.5.4.1.7 Barometer: The barometer may be mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in Hg). In many cases, the barometric reading may be obtained from a nearby National Weather Service Station, in which case the station value (which is the absolute barometric pressure) is requested and an adjustment for elevation differences between the weather station and sampling point is applied at a rate of minus 2.5 mm Hg (0.1 in Hg) per 30 m (100 ft) elevation increases (vice versa for elevation decrease).

3.5.4.1.8 Gas Density Determination Equipment: Temperature sensor and pressure gauge (as described in sections 2.3 and 2.3 of EPA method 2), and gas analyzer, if necessary (as described in EPA method 3). The temperature sensor ideally should be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal. Alternatively, the sensor may be attached just prior to use in the field. Note, however, that if the temperature sensor is attached in the field, the sensor must be placed in an interference-free arrangement with respect to the Type S pitot openings (see EPA method 2, Figure 2-7). As a second alternative, if a difference of no more than 1% in the average velocity measurement is to be introduced, the temperature gauge need not be attached to the probe or pitot tube.

3.5.4.2 Sample Recovery.

3.5.4.2.1 Probe Liner: Probe nozzle and brushes; Teflon bristle brushes with stainless steel wire handles are required. The probe brush shall have extensions of stainless steel, Teflon, or inert material at least as long as the probe. The brushes shall be properly sized and shaped to brush out the probe liner, the probe nozzle, and the impingers.

3.5.4.2.2 Wash Bottles: Three wash bottles are required. Teflon or glass wash bottles are recommended; polyethylene wash bottles should not be used because organic contaminants may be extracted by exposure to organic solvents used for sample recovery.

3.5.4.2.3 Graduate Cylinder and/or Balance: A graduated cylinder or balance is required to measure condensed water to the nearest 1 ml or 1 g. Graduated cylinders shall have division not ≥ 2 ml. Laboratory balances capable of weighing to ± 0.5 g are required.

3.5.4.2.4 Amber Glass Storage Containers: One-liter wide-mouth amber flint glass bottles with Teflon-lined caps are required to store impinger water samples. The bottles must be sealed with Teflon tape.

3.5.4.2.5 Rubber Policeman and Funnel: A rubber policeman and funnel are required to aid in the transfer of material into and out of containers in the field.

3.5.4.3 Reagent Preparation.

3.5.4.3.1 Bottles/Caps: Amber 1- or 4-L bottles with Teflon-lined caps are required for storing cleaned DNPH solution. Additional 4-L bottles are required to collect waste organic solvents.

3.5.4.3.2 Large Glass Container: At least one large glass (8 to 16 L) is required for mixing the aqueous acidic DNPH solution.

3.5.4.3.3 Stir Plate/Large Stir Bars/Stir Bar Retriever: A magnetic stir plate and large stir bar are required for the mixing of aqueous acidic DNPH solution. A stir bar retriever is needed for removing the stir bar from the large container holding the DNPH solution.

3.5.4.3.4 Buchner Filter/Filter Flask/Filter Paper: A large filter flask (2–4 L) with a buchner filter, appropriate rubber stopper, filter paper, and connecting tubing are required for filtering the aqueous acidic DNPH solution prior to cleaning.

3.5.4.3.5 Separatory Funnel: At least one large separatory funnel (2 L) is required for cleaning the DNPH prior to use.

3.5.4.3.6 Beakers: Beakers (150 ml, 250 ml, and 400 ml) are useful for holding/measuring organic liquids when cleaning the aqueous acidic DNPH solution and for weighing DNPH crystals.

3.5.4.3.7 Funnels: At least one large funnel is needed for pouring the aqueous acidic DNPH into the separator funnel.

3.5.4.3.8 Graduated Cylinders: At least one large graduated cylinder (1 to 2 L) is required for measuring organic-free reagent water and acid when preparing the DNPH solution.

3.5.4.3.9 Top-Loading Balance: A one-place top loading balance is needed for weighing out the DNPH crystals used to prepare the aqueous acidic DNPH solution.

3.5.4.3.10 Spatulas: Spatulas are needed for weighing out DNPH when preparing the aqueous DNPH solution.

3.5.4.4 Crushed Ice: Quantities ranging from 10-50 lb may be necessary during a sampling run, depending upon ambient temperature. Samples which have been taken must be stored and shipped cold; sufficient ice for this purpose must be allowed.

3.5.5 Reagents

3.5.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.5.5.2 Organic-free reagent water: All references to water in this method refer to organic-free reagent water, as defined in Chapter One.

3.5.5.3 Silica Gel: Silica gel shall be indicating type, 6-16 mesh. If the silica gel has been used previously, dry at 175°C (350 °F) for 2 hours before using. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used.

3.5.5.4 2,4-dinitrophenylhydrazine (DNPH), [2,4-(O₂N)₂C₆H₃] NHNH₂-The quantity of water may vary from 10 to 30%.

3.5.5.4.1 The 2,4-dinitrophenylhydrazine reagent must be prepared in the laboratory within five days of sampling use in the field. Preparation of DNPH can also be done in the field, with consideration of appropriate procedures required for safe handling of solvent in the field. When a container of prepared DNPH reagent is opened in the field, the contents of the opened container should be used within 48 hours. All laboratory glassware must be washed with detergent and water and rinsed with water, methanol, and methylene chloride prior to use.

Note: DNPH crystals or DNPH solution should be handled with plastic gloves at all times with prompt and extensive use of running water in case of skin exposure.

3.5.5.4.2 Preparation of Aqueous Acidic DNPH Derivatizing Reagent: Each batch of DNPH reagent should be prepared and purified within five days of sampling, according to the procedures described below.

Note: Reagent bottles for storage of cleaned DNPH derivatizing solution must be rinsed with acetonitrile and dried before use. Baked glassware is not essential for preparation of DNPH reagent. The glassware must not be rinsed with acetone or an unacceptable concentration of acetone contamination will be introduced. If field preparation of DNPH is performed, caution must be exercised in avoiding acetone contamination.

3.5.5.4.2.1 Place an 8 L container under a fume hood on a magnetic stirrer. Add a large stir bar and fill the container half full of organic-free reagent water. Save the empty bottle from the organic-free reagent water. Start the stirring bar and adjust the stir rate to be as

fast as possible. Using a graduated cylinder, measure 1.4 ml of concentrated hydrochloric acid. Slowly pour the acid into the stirring water. Fumes may be generated and the water may become warm. Weight the DNPH crystals on a one-place balance (see Table 3.5-1 for approximate amounts) and add to the stirring acid solution. Fill the 8-L container to the 8-L mark with organic-free reagent water and stir overnight. If all of the DNPH crystals have dissolved overnight, add additional DNPH and stir for two more hours. Continue the process of adding DNPH with additional stirring until a saturated solution has been formed. Filter the DNPH solution using vacuum filtration. Gravity filtration may be used, but a much longer time is required. Store the filtered solution in an amber bottle at room temperature.

3.5.5.4.2.2 Within five days of proposed use, place about 1.6 L of the DNPH reagent in a 2-L separatory funnel. Add approximately 200 ml of methylene chloride and stopper the funnel. Wrap the stopper of the funnel with paper towels to absorb any leakage. Invert and vent the funnel. Then shake vigorously for 3 minutes. Initially, the funnel should be vented frequently (every 10–15 sec). After the layers have separated, discard the lower (organic) layer.

3.5.5.4.2.3 Extract the DNPH a second time with methylene chloride and finally with cyclohexane. When the cyclohexane layer has separated from the DNPH reagent, the cyclohexane layer will be the top layer in the separatory funnel. Drain the lower layer (the cleaned extract DNPH reagent solution) into an amber bottle that has been rinsed with acetonitrile and allowed to dry.

3.5.5.4.3 Quality Control: Take two aliquots of the extracted DNPH reagent. The size of the aliquots is dependent upon the exact sampling procedure used, but 100 ml is reasonably representative. To ensure that the background in the reagent is acceptable for field use, analyze one aliquot of the reagent according to the procedure of method 8315. Save the other aliquot of aqueous acidic DNPH for use as a method blank when the analysis is performed.

Table 3.5-1.—Approximate Amount of Crystalline DNPH Used to Prepare a Saturated Solution

Amount of moisture in DNPH	Weight required per 8 L of solution
10 weight percent	31 g
15 weight percent	33 g
30 weight percent	40 g

Table 3.5-2.—Instrument Detection Limits and Reagent Capacity for Formaldehyde Analysis¹

Analyte	Detection limit, ppb ²	Reagent capacity ppmv
Formaldehyde	1.8	66
Acetaldehyde	1.7	70
Acrolein	1.5	75
Acetone/Propionaldehyde	1.5	75
Butyraldehyde	1.5	79
Methyl ethyl ketone	1.5	79
Valeraldehyde	1.5	84
Isovaleraldehyde	1.4	84
Hexaldehyde	1.3	88
Benzaldehyde	1.4	84
o-/m-/p-Tolualdehyde	1.3	89
Dimethylbenzaldehyde	1.2	93

¹ Oxygenated compounds in addition to formaldehyde are included for comparison with formaldehyde; extension of the methodology to other compounds is possible.

² Detection limits are determined in solvent. These values therefore represent the optimum capability of the methodology.

3.5.5.4.4 Shipment to the Field: Tightly cap the bottle containing extracted DNPH reagent using a Teflon-lined cap. Seal the bottle with Teflon tape. After the bottle is labeled, the bottle may be placed in a friction-top can (paint can or equivalent) containing a 1-2 inch layer of granulated charcoal and stored at ambient temperature until use.

3.5.5.4.4.1 If the DNPH reagent has passed the Quality Control criteria, the reagent may be packaged to meet necessary shipping requirements and sent to the sampling area. If the Quality Control criteria are not met, the reagent solution may be re-extracted or the solution may be re-prepared and the extraction sequence repeated.

3.5.5.4.4.2 If the DNPH reagent is not used in the field within five days of extraction, an aliquot may be taken and analyzed as described in method 0011A. If the reagent meets the Quality Control requirements, the reagent may be used. If the reagent does not meet the Quality Control requirements, the reagent must be discarded and new reagent must be prepared and tested.

3.5.5.4.5 Calculation of Acceptable Concentrations of Impurities in DNPH Reagent: The acceptable impurity concentration (AIC, $\mu\text{g}/\text{ml}$) is calculated from the expected analyte concentration in the sampled gas (EAC, ppbv), the volume of air that will be sampled at standard conditions (SVOL, L), the formula weight of the analyte (FW, g/mol), and the volume of DNPH reagent that will be used in the impingers (RVOL, ml):

$$\text{AIC} = 0.1 \times [\text{EAC} \times \text{SVOL} \times \text{FW}/22.4 \times (\text{FW} + 180)/\text{FW}](\text{RVOL} \times 1,000)$$

where:

0.1 is the acceptable contaminant concentration,

22.4 is a factor relating ppbv to g/L ,

180 is a factor relating underderivatized to derivatized analyte

1,000 is a unit conversion factor.

3.5.5.4.6 Disposal of Excess DNPH Reagent: Excess DNPH reagent may be returned to the laboratory and recycled or treated as aqueous waste for disposal purposes. 2,4-dinitrophenylhydrazine is a flammable solid when dry, so water should not be evaporated from the solution of the reagent.

3.5.5.5 Field Spike Standard Preparation: To prepare a formaldehyde field spiking standard at 4.01 mg/ml , use a 500 μl syringe to transfer 0.5 ml to 37% by weight of formaldehyde (401 mg/ml) to a 50 ml volumetric flask containing approximately 50 ml of methanol. Dilute to 50 ml with methanol.

3.5.5.6 Hydrochloric Acid, HCL: Reagent grade hydrochloric acid (approximately 12N) is required for acidifying the aqueous DNPH solution.

3.5.5.7 Methylene Chloride, CH_2Cl_2 : Methylene chloride (suitable for residue and pesticide analysis, GC/MS, HPLC, GC, Spectrophotometry or equivalent) is required for cleaning the aqueous acidic DNPH solution, rinsing glassware, and recovery of sample trains.

3.5.5.8 Cyclohexane, C_6H_{12} : Cyclohexane (HPLC grade) is required for cleaning the aqueous acidic DNPH solution.

Note: Do not use spectroanalyzed grades of cyclohexane if this sampling methodology is extended to aldehydes and ketones with four or more carbon atoms.

3.5.5.9 Methanol, CH_3OH : Methanol (HPLC grade or equivalent) is required for rinsing glassware.

3.5.5.10 Acetonitrile, CH_3CN : Acetonitrile (HPLC grade or equivalent) is required for rinsing glassware.

3.5.5.11 Formaldehyde, HCHO: Analytical grade or equivalent formaldehyde is required for preparation of standards. If other aldehydes or ketones are used, analytical grade or equivalent is required.

3.5.6 Sample Collection, Preservation, and Handling

3.5.6.1 Because of the complexity of this method, field personnel should be trained in and experienced with the test procedures in order to obtain reliable results.

3.5.6.2 Laboratory Preparation:

3.5.6.2.1 All the components shall be maintained and calibrated according to the procedure described in APTD-0576, unless otherwise specified.

3.5.6.2.2 Weigh several 200 to 300 g portions of silica gel in airtight containers to the nearest 0.5 g. Record on each container the total weight of the silica gel plus containers. As an alternative to preweighing the silica gel, it may instead be weighed directly in the impinger or sampling holder just prior to train assembly.

3.5.6.3 Preliminary Field Determinations:

3.5.6.3.1 Select the sampling site and the minimum number of sampling point according to EPA method 1 or other relevant criteria. Determine the stack pressure, temperature, and range of velocity heads using EPA method 2. A leak-check of the pitot lines according to EPA method 2, section 3.1, must be performed. Determine the stack gas moisture content using EPA Approximation method 4 or its alternatives to establish estimates of isokinetic sampling-rate settings. Determine the stack gas dry molecular weight, as described in EPA method 2, section 3.6. If integrated EPA method 3 sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as, the sample run.

3.5.6.3.2 Select a nozzle size based on the range of velocity heads so that is not necessary to change the nozzle size in order to maintain isokinetic sampling rates below 28 L/min (1.0 cfm). During the run, do not change the nozzle. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see section 2.2. of EPA method 2).

3.5.6.3.3 Select a suitable probe liner and probe length so that all traverse points can be sampled. For large stacks, to reduce the length of the probe, consider sampling from opposite sides of the stack.

3.5.6.3.4 A minimum of 45 ft³ of sample volume is required for the determination of the Destruction and Removal Efficiency (DRE) of formaldehyde from incineration systems (45 ft³ is equivalent to one hour of sampling at 0.75 dscf). Additional sample volume shall be collected as necessitated by the capacity of the DNPH reagent and analytical detection limit constraints. To determine the minimum sample volume required, refer to sample calculations in section 10.

3.5.6.3.5 Determine the total length of sampling time needed to obtain the identified minimum volume by comparing the anticipated average sampling rate with the volume requirement. Allocate the same time to all traverse points defined by EPA method 1. To avoid timekeeping errors, the length of time sampled at each traverse point should be an integer or an integer plus 0.5 min.

3.5.6.3.6 In some circumstances (e.g., batch cycles) it may be necessary to sample for shorter times at the traverse points and to obtain smaller gas-volume samples. In these cases, careful documentation must be maintained in order to allow accurate calculation of concentrations.

3.5.6.4 Preparation of Collection Train:

3.5.6.4.1 During preparation and assembly of the sampling train, keep all openings where contamination can occur covered with Teflon film or aluminum foil until just prior to assembly or until sampling is about to begin.

3.5.6.4.2 Place 100 ml of cleaned DNPH solution in each of the first two impingers, and leave the third impinger empty. If additional capacity is required for high expected concentrations of formaldehyde in the stack gas, 200 ml of DNPH per impinger may be used or additional impingers may be used for sampling. Transfer approximately 200 to 300 g of pre-weighed silica gel from its container to the fourth impinger. Care should be taken to ensure that the silica gel is not entrained and carried out from the impinger during sampling. Place

the silica gel container in a clean place or later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

3.5.6.4.3 With a glass or quartz liner, install the selected nozzle using a Viton-A O-ring with stack temperatures are $<260\text{ }^{\circ}\text{C}$ ($500\text{ }^{\circ}\text{F}$) and a woven glass-fiber gasket when temperatures are higher. See APTD-0576 (Rom, 1972) for details. Other connection systems utilizing either 316 stainless steel or Teflon ferrules may be used. Mark the probe with heat-resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

3.5.6.4.4 Assemble the train as shown in Figure 3.5-1. During assembly, do not use any silicone grease on ground-glass joints upstream of the impingers. Use Teflon tape, if required. A very light coating of silicone grease may be used on ground-glass joints downstream of the impingers, but the silicone grease should be limited to the outer portion (see APTD-0576) of the ground-glass joints to minimize silicone grease contamination. If necessary, Teflon tape may be used to seal leaks. Connect all temperature sensors to an appropriate potentiometer/display unit. Check all temperature sensors at ambient temperatures.

3.5.6.4.5 Place crushed ice all around the impingers.

3.5.6.4.6 Turn on and set the probe heating system at the desired operating temperature. Allow time for the temperature to stabilize.

3.5.6.5 Leak-Check Procedures:

3.5.6.5.1 Pre-test Leak Check.

3.5.6.5.1.1 After the sampling train has been assembled, turn on and set the probe heating system at the desired operating temperature. Allow time for the temperature to stabilize. If a Viton-A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak check the train at the sampling site by plugging the nozzle and pulling a 381 mm Hg (15 in Hg) vacuum.

Note: A lower vacuum may be used, provided that the lower vacuum is not exceeded during the test.

3.5.6.5.1.2 If an asbestos string is used, do not connect the probe to the train during the leak check. Instead, leak-check the train by first attaching a carbon-filled leak check impinger to the inlet and then plugging the Inlet and pulling a 381 mm Hg (15 in Hg) vacuum. (A lower vacuum may be used if this lower vacuum is not exceeded during the test.) Next connect the probe to the train and leak-check at about 25 mm Hg (1 in Hg) vacuum. Alternatively, leak-check the probe with the rest of the sampling train in one step at 381 mm Hg (15 in Hg) vacuum. Leakage rates in excess of (a) 4% of the average sampling rate or (b) $\geq 0.00057\text{ m}^3/\text{min}$ (0.02 cfm), are unacceptable.

3.5.6.5.1.3 The following leak check instructions for the sampling train described in ADPT-0576 and APTD-0581 may be helpful. Start the pump with the fine-adjust valve fully open and coarse-valve completely closed. Partially open the coarse-adjust valve and slowly close the fine-adjust valve until the desired vacuum is reached. Do not reverse direction of the fine-adjust valve, as liquid will back up into the train. If the desired vacuum is exceeded, either perform the leak check at this higher vacuum or end the leak check, as shown below, and start over.

3.5.6.5.1.4 When the leak check is completed, first slowly remove the plug from the inlet to the probe. When the vacuum drops to 127 mm (5 in) Hg or less, immediately close the coarse-adjust valve. Switch off the pumping system and reopen the fine-adjust valve. Do not reopen the fine-adjust valve until the coarse-adjust valve has been closed to prevent the liquid in the impingers from being forced backward in the sampling line and silica gel from being entrained backward into the third impinger.

3.5.6.5.2 Leak Checks During Sampling Run:

3.5.6.5.2.1 If, during the sampling run, a component change (i.e., impinger) becomes necessary, a leak check shall be conducted immediately after the interruption of sampling and before the change is made. The leak check shall be done according to the procedure described in section 3.5.6.5.1, except that it shall be done at a vacuum greater than or equal

to the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00057 m³/min (0.02 cfm or 4% of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester must void the sampling run.

Note: Any correction of the sample volume by calculation reduces the integrity of the pollutant concentration data generated and must be avoided.

3.5.6.5.2.2 Immediately after a component change and before sampling is reinitiated, a leak check similar to a pre-test leak check must also be conducted.

3.5.6.5.3 Post-test Leak Check:

3.5.6.5.3.1 A leak check is mandatory at the conclusion of each sampling run. The leak check shall be done with the same procedures as the pre-test leak check, except that the post-test leak check shall be conducted at a vacuum greater than or equal to the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00057 m³/min (0.02 cfm) or 4% of the average sampling rate (whichever is less), the results are acceptable. If, however, a higher leakage rate is obtained, the tester shall record the leakage rate and void the sampling run.

3.5.6.6 Sampling Train Operation:

3.5.6.6.1 During the sampling run, maintain an isokinetic sampling rate to within 10% of true isokinetic, below 20 L/min (1.0 cfm). Maintain a temperature around the probe of 120 °C (248° ± 25°F).

3.5.6.6.2 For each run, record the data on a data sheet such as the one shown in Figure 3.5-2. Be sure to record the initial dry-gas meter reading. Record the dry-gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made, before and after each leak check, and when sampling is halted. Take other readings required by Figure 2 at least once at each sample point during each time increment and additional readings when significant adjustments (20% variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.

3.5.6.6.3 Clean the stack access ports prior to the test run to eliminate the change of sampling deposited material. To begin sampling, remove the nozzle cap, verify that the filter and probe heating systems are at the specified temperature, and verify that the pitot tube and probe are properly positioned. Position the nozzle at the first traverse point, with the tip pointing directly into the gas stream. Immediately start the pump and adjust the flow to isokinetic conditions. Nomographs, which aid in the rapid adjustment of the isokinetic sampling rate without excessive computations, are available. These nomographs are designed for use when the Type S pitot tube coefficient is 0.84 ± 0.02 and the stack gas equivalent density (dry molecular weight) is equal to 29 ± 4 . APTD-0576 details the procedure for using the nomographs. If the stack gas molecular weight and the pitot tube coefficient are outside the above ranges, do not use the nomographs unless appropriate steps are taken to compensate for the deviations.

3.5.6.6.5 When the probe is in position, block off the openings around the probe and stack access port to prevent unrepresentative dilution of the gas stream.

3.5.6.6.6 Traverse the stack cross section, as required by EPA Method 1, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the access port, in order to minimize the chance of extracting deposited material.

3.5.6.6.7 During the test run, make periodic adjustments to keep the temperature around the probe at the proper levels. Add more ice and, if necessary, salt, to maintain a temperature of ≥ 20 °C (68 °F) at the silica gel outlet. Also, periodically check the level and zero of the manometer.

3.5.6.6.8 A single train shall be used for the entire sampling run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or in cases where equipment failure necessitates a change of trains. An additional train or additional trains may also be used for sampling when the capacity of a single train is exceeded.

3.5.6.6.9 When two or more trains are used, separate analyses of components from each train shall be performed. If multiple trains have been used because the capacity of a single train would be exceeded, first impingers from each train may be combined, and second impingers from each train may be combined.

3.5.6.6.10 At the end of the sampling run, turn off the coarse-adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final dry gas meter reading, and conduct a post-test leak check. Also, leak check the pitot lines as described in EPA method 2. The lines must pass this leak check in order to validate the velocity-head data.

3.5.6.6.11 Calculate percent isokineticity (see method 2) to determine whether the run was valid or another test should be made.

3.5.7 Sample Recovery

3.5.7.1 Preparation.

3.5.7.1.1 Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool. When the probe can be handled safely, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over the tip to prevent losing or gaining particulate matter. Do not cap the probe tip tightly while the sampling train is cooling because a vacuum will be created, drawing liquid from the impingers back through the sampling train.

3.5.7.1.2 Before moving the sampling train to the cleanup site, remove the probe from the sampling train and cap the open outlet, being careful not to lose any condensate that might be present. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used, let any condensed water or liquid drain into the impingers. Cap off any open impinger inlets and outlets. Ground glass stoppers, Teflon caps or caps of other inert materials may be used to seal all openings.

3.5.7.1.3 Transfer the probe and impinger assembly to an area that is clean and protected from wind so that the chances of contaminating or losing the sample are minimized.

3.5.7.1.4 Inspect the train before and during disassembly, and note any abnormal conditions.

3.5.7.1.5 Save a portion of all washing solution (methylene chloride, water) used for cleanup as a blank. Transfer 200 ml of each solution directly from the wash bottle being used and place each in a separate, pre-labeled sample container.

3.5.7.2 Sample Containers.

3.5.7.2.1 Container 1: Probe and Impinger Catches. Using a graduated cylinder, measure to the nearest ml, and record the volume of the solution in the first three impingers. Alternatively, the solution may be weighed to the nearest 0.5 g. Include any condensate in the probe in this determination. Transfer the impinger solution from the graduated cylinder into the amber flint glass bottle. Taking care that dust on the outside of the probe or other exterior surfaces does not get into the sample, clean all surfaces to which the sample is

exposed (including the probe nozzle, probe fitting, probe liner, first impinger, and impinger connector) with methylene chloride. Use less than 500 ml for the entire wash (250 ml would be better, if possible). Add the washing to the sample container.

3.5.7.2.1.1 Carefully remove the probe nozzle and rinse the inside surface with methylene chloride from a wash bottle. Brush with a Teflon bristle brush, and rinse until the rinse shows no visible particles or yellow color, after which make a final rinse of the inside surface. Brush and rinse the inside parts of the Swagelok fitting with methylene chloride in a similar way.

3.5.7.2.1.2 Rinse the probe liner with methylene chloride. While squirting the methylene chloride into the upper end of the probe, tilt and rotate the probe so that all inside surfaces will be wetted with methylene chloride. Let the methylene chloride drain from the lower end into the sample container. The tester may use a funnel (glass or polyethylene) to aid in transferring the liquid washes to the container. Follow the rinse with a Teflon brush. Hold the probe in an inclined position, and squirt methylene chloride into the upper end as the probe brush is being pushed with a twisting action through the probe. Hold the sample container underneath the lower end of the probe, and catch any methylene chloride, water, and particulate matter that is brushed from the probe. Run the brush through the probe three times or more. With stainless steel or other metal probes, run the brush through in the above prescribed manner at least six times since there may be small crevices in which particulate matter can be entrapped. Rinse the brush with methylene chloride or water, and quantitatively collect these washings in the sample container. After the brushing, make a final rinse of the probe as described above.

Note: Two people should clean the probe in order to minimize sample losses. Between sampling runs, brushes must be kept clean and free from contamination.

3.5.7.2.1.3 Rinse the inside surface of each of the first three impingers (and connecting tubing) three separate times. Use a small portion of methylene chloride for each rinse, and brush each surface to which the sample is exposed with a Teflon bristle brush to ensure recovery of fine particulate matter. Water will be required for the recovery of the impingers in addition to the specified quantity of methylene chloride. There will be at least two phases in the impingers. This two-phase mixture does not pour well, and a significant amount of the impinger catch will be left on the walls. The use of water as a rinse makes the recovery quantitative. Make a final rinse of each surface and of the brush, using both methylene chloride and water.

3.5.7.2.1.4 After all methylene chloride and water washing and particulate matter have been collected in the sample container, tighten the lid so the solvent, water, and DNPH reagent will not leak out when the container is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Seal the container with Teflon tape. Label the container clearly to identify its contents.

3.5.7.2.1.5 If the first two impingers are to be analyzed separately to check for breakthrough, separate the contents and rinses of the two impingers into individual containers. Care must be taken to avoid physical carryover from the first impinger to the second. The formaldehyde hydrazone is a solid which floats and froths on top of the impinger solution. Any physical carryover of collected moisture into the second impinger will invalidate a breakthrough assessment.

3.5.7.2.2 Container 2: Sample Blank. Prepare a blank by using an amber flint glass container and adding a volume of DNPH reagent and methylene chloride equal to the total volume in Container 1. Process the blank in the same manner as Container 1.

3.5.7.2.3 Container 3: Silica Gel. Note the color of the indicating silica gel to determine whether it has been completely spent and make a notation of its condition. The impinger containing the silica gel may be used as a sample transport container with both ends sealed with tightly fitting caps or plugs. Ground-glass stoppers or Teflon caps may be used. The silica gel impinger should then be labeled, covered with aluminum foil, and packaged on ice for transport to the laboratory. If the silica gel is removed from the impinger, the tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere to

the impinger wall and are difficult to remove. Since the gain in weight is to be used for moisture calculations, do not use water or other liquids to transfer the silica gel. If a balance is available in the field, the spent silica gel (or silica gel plus impinger) may be weighed to the nearest 0.5 g.

3.5.7.2.4 Sample containers should be placed in a cooler, cooled by (although not in contact with) ice. Sample containers must be placed vertically and, since they are glass, protected from breakage during shipment. Samples should be cooled during shipment so they will be received cold at the laboratory.

3.5.8 Calibration

3.5.8.1 Probe Nozzle: Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in). Make measurements at three separate places across the diameter and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in). When the nozzles become nicked or corroded, they shall be replaced and calibrated before use. Each nozzle must be permanently and uniquely identified.

3.5.8.2 Pitot Tube: The Type S pitot tube assembly shall be calibrated according to the procedure outlined in Section 4 of EPA Method 2 or assigned a nominal coefficient of 0.84 if it is not visibly nicked or corroded and if it meets design and intercomponent spacing specifications.

3.5.8.3 Metering System.

3.5.8.3.1 Before its initial use in the field, the metering system shall be calibrated according to the procedure outlined in APTD-0576. Instead of physically adjusting the dry-gas meter dial readings to correspond to the wet-test meter readings, calibration factors may be used to correct the gas meter dial readings mathematically to the proper values. Before calibrating the metering system, it is suggested that a leak check be conducted. For metering systems having diaphragm pumps, the normal leak check procedure will not detect leakages with the pump. For these cases, the following leak check procedure will apply: make a ten-minute calibration run at 0.00057 m³/min (0.02 cfm). At the end of the run, take the difference of the measured wettest and dry-gas meter volumes and divide the difference by 10 to get the leak rate. The leak rate should not exceed 0.00057 m³/min (0.02 cfm).

3.5.8.3.2 After each field use, check the calibration of the metering system by performing three calibration runs at a single intermediate orifice setting (based on the previous field test). Set the vacuum at the maximum value reached during the test series. To adjust the vacuum, insert a valve between the wet-test meter and the inlet of the metering system. Calculate the average value of the calibration factor. If the calibration has changed by more than 5%, recalibrate the meter over the full range of orifice settings, as outlined in APTD-0576.

3.5.8.3.3 Leak check of metering system: The portion of the sampling train from the pump to the orifice meter (see Figure 1) should be leak checked prior to initial use and after each shipment. Leakage after the pump will result in less volume being recorded than is actually sampled. Use the following procedure: Close the main valve on the meter box. Insert a one-hole rubber stopper with rubber tubing attached into the orifice exhaust pipe. Disconnect and vent the low side of the orifice manometer. Close off the low side orifice tap. Pressurize the system to 13–18 cm (5–7 in) water column by blowing into the rubber tubing. Pinch off the tubing and observe the manometer for 1 min. A loss of pressure on the manometer indicates a leak in the meter box. Leaks must be corrected.

Note: If the dry-gas-meter coefficient values obtained before and after a test series differ by $\geq 5\%$, either the test series must be voided or calculations for test series must be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

3.5.8.4 Probe Heater: The probe heating system must be calibrated before its initial use in the field according to the procedure outlined in APTD-0576. Probes constructed according to APTD-0581 need not be calibrated if the calibration curves in APTD-0576 are used.

3.5.8.5 Temperature gauges: Each thermocouple must be permanently and uniquely marked on the casting. All mercury-in-glass reference thermometers must conform to ASTM E-1

63C or 63F specifications. Thermocouples should be calibrated in the laboratory with and without the use of extension leads. If extension leads are used in the field, the thermocouple readings at the ambient air temperatures, with and without the extension lead, must be noted and recorded. Correction is necessary if the use of an extension lead produces a change $\geq 1.5\%$.

3.5.8.5.1 Impinger and dry-gas meter thermocouples: For the thermocouples used to measure the temperature of the gas leaving the impinger train, three-point calibration at ice water, room air, and boiling water temperatures is necessary. Accept the thermocouples only if the readings at all three temperatures agree to $\pm 2\text{C}$ ($3.60\text{ }^\circ\text{F}$) with those of the absolute value of the reference thermometer.

3.5.8.5.2 Probe and stack thermocouple: For the thermocouples used to indicate the probe and stack temperatures, a three-point calibration at ice water, boiling water, and hot oil bath temperatures must be performed. Use of a point at room air temperature is recommended. The thermometer and thermocouple must agree to within 1.5% at each of the calibration points. A calibration curve (equation) may be constructed (calculated) and the data extrapolated to cover the entire temperature range suggested by the manufacturer.

3.5.8.6 Barometer: Adjust the barometer initially and before each test series to agree to within $\pm 2.5\text{ mm Hg}$ (0.1 in Hg) of the mercury barometer or the correct barometric pressure value reported by a nearby National Weather Service Station (same altitude above sea level).

3.5.8.7 Triple-beam balance: Calibrate the triple-beam balance before each test series, using Class S standard weights. The weights must be within $\pm 0.5\%$ of the standards, or the balance must be adjusted to meet these limits.

3.5.9 Calculations

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculations.

3.5.9.1 Calculation of Total Formaldehyde: To determine the total formaldehyde in mg, use the following equation:

$$X \frac{[\text{g/mole aldehyde}]}{[\text{g/mole DNPH derivative}]} \times 10^3 \text{ mg}/\mu\text{g}$$

C_D = measured concentration of DNPH-formaldehyde derivative, $\mu\text{g/ml}$.

V = organic extract volume ml.

DF = dilution factor.

3.5.9.2 Formaldehyde concentration in stack gas.

Determine the formaldehyde concentration in the stack gas using the following equation:

$$C_T = K [\text{total formaldehyde, mg}] V_M(\text{infrfs}; T_D)$$

where:

$K = 35.31\text{ft}^3/\text{m}^3$ if $V_M(\text{STD})$ is expressed in English units

$= 1.00\text{m}^3/\text{m}^3$ if $V_M(\text{STD})$ is expressed in metric units.

$V_M(\text{STD})$ volume of gas sample a measured by dry gas meter, corrected to standard conditions, dscm (dscf).

3.5.9.3 Average Dry Gas Meter Temperature and Average Orifice Pressure Drop are obtained from the data sheet.

3.5.9.4 Dry Gas Volume: Calculate $V_{M(\text{STD})}$ and adjust for leakage, if necessary, using the equation in section 6.3 of EPA method 5.

3.5.9.5 Volume of Water Vapor and Moisture Content: Calculate the volume of water vapor and moisture content from equations 5-2 and 5-3 of EPA method 5.

3.5.10 Determination of Volume to be Sampled

To determine the minimum sample volume to be collected, use the following sequence of equations.

3.5.10.1 From prior analysis of the waste feed, the concentration of formaldehyde (FORM) introduced into the combustion system can be calculated. The degree of destruction and removal efficiency that is required is used to determine the amount of FORM allowed to be present in the effluent. This amount may be expressed as:

$$\text{Max FORM Mass} = [(\text{WF}) (\text{FORM conc}) (100-\text{DRE})]/100$$

where:

WF = mass flow rate of waste feed per h, g/h (lb/h).

FORM = concentration of FORM (wt %) introduced into the combustion process.

DRE = percent Destruction and Removal Efficiency required.

Max FORM = mass flow rate (g/h [lb/]) of FORM emitted from the combustion sources.

3.5.10.2 The average discharge concentration of the FORM in the effluent gas is determined by comparing the Max FORM with the volumetric flow rate being exhausted from the source. Volumetric flow rate data are available as a result of preliminary EPA method 1-4 determinations:

$$\text{Max FORM conc} = [\text{Max FORM Mass}] / \text{DV}_{\text{EFF}}(\text{infrfs};\text{TD})$$

where:

FORM conc = anticipated concentration of the FORM in the exhaust gas stream, g/dscm (lb/dscf).

3.5.10.3 In making this calculation, it is recommended that a safety margin of at least ten be included.

$$[\text{LDL}_{\text{FORM}} \times 10 / \text{FORM conc}] \text{V}_{\text{TBC}}$$

where:

LDL_{FORM} = detectable amount of FORM in entire sampling train.

V_{TBC} = minimum dry standard volume to be collected at dry-gas meter.

3.5.10.4 The following analytical detection limits and DNPH Reagent Capacity (based on a total volume of 200 ml in two impingers) must also be considered in determining a volume to be sampled.

3.5.11 Quality Control

3.5.11.1 Sampling: See EPA Manual 600/4-77-02b for Method 5 quality control.

3.5.11.2 Analysis: The quality assurance program required for this method includes the analysis of the field and method blanks, procedure validations, and analysis of field spikes. The assessment of combustion data and positive identification and quantitation of formaldehyde are dependent on the integrity of the samples received and the precision and accuracy of the analytical methodology. Quality assurance procedures for this method are designed to monitor the performance of the analytical methodology and to provide the required information to take corrective action if problems are observed in laboratory operations or in field sampling activities.

3.5.11.2.1 Field Blanks: Field blanks must be submitted with the samples collected at each sampling site. The field blanks include the sample bottles containing aliquots of sample recovery solvents, methylene chloride and water, and unused DNPH reagent. At a minimum, one complete sampling train will be assembled in the field staging area, taken to the sampling area, and leak-checked at the beginning and end of the testing (or for the same total number of times as the actual sampling train). The probe of the blank train must be heated during the sample test. The train will be recovered as if it were an actual test sample. No gaseous sample will be passed through the blank sampling train.

3.5.11.2.2 Method Blanks: A method blank must be prepared for each set of analytical operations, to evaluate contamination and artifacts that can be derived from glassware, reagents, and sample handling in the laboratory.

3.5.11.2.3 Field Spike: A field spike is performed by introducing 200 μL of the Field Spike Standard into an impinger containing 200 ml of DNPH solution. Standard impinger recovery procedures are followed and the spike is used as a check on field handling and

recovery procedures. An aliquot of the field spike standard is retained in the laboratory for derivatization and comparative analysis.

3.5.12 Method Performance

3.5.12.1 Method performance evaluation: The expected method performance parameters for precision, accuracy, and detection limits are provided in Table 3.5-3.

Addition of a Filter to the Formaldehyde Sampling Train

As a check on the survival of particulate material through the impinger system, a filter can be added to the impinger train either after the second impinger or after the third impinger. Since the impingers are in an ice bath, there is no reason to heat the filter at this point.

Any suitable medium (e.g., paper, organic membrane) may be used for the filter if the material conforms to the following specifications:

(1) the filter has at least 95% collection efficiency (<5% penetration) for 3 μm dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM standard method D2986-71. Test data from the supplier's quality control program are sufficient for this purpose.

(2) the filter has a low aldehyde blank value (<0.015 mg formaldehyde/cm² of filter area). Before the test series, determine the average formaldehyde blank value of at least three filters (from the lot to be used for sampling) using the applicable analytical procedures.

Table 3.5-3.—Expected Method Performance for Formaldehyde

Parameter	Precision ¹	Accuracy ²	Detection limits ³
Matrix: Dual trains	$\pm 15\%$ RPD	$\pm 20\%$	1.5×10^{-7} lb/ft ³ (1.8 ppbv).

¹ Relative percent difference limit for dual trains.

² Limit for field spike recoveries.

³ The lower reporting limit having less than 1% probability of false positive detection.

Recover the exposed filter into a separate clean container and return the container over ice to the laboratory for analysis. If the filter is being analyzed for formaldehyde, the filter may be recovered into a container or DNPH reagent for shipment back to the laboratory. If the filter is being examined for the presence of particulate material, the filter may be recovered into a clean dry container and returned to the laboratory.

3.6 Analysis for Aldehydes and Ketones by High Performance Liquid Chromatography (HPLC) (Method 0011A)

3.6.1 Scope and Application

3.6.1.1 Method 0011A covers the determination of free formaldehyde in the aqueous samples and leachates and derived aldehydes/ketones collected by method 0011.

Compound name	CAS No. ¹
Formaldehyde	50-00-0
Acetaldehyde	75-07-0

¹ Chemical Abstract Services Registry Number

3.6.1.2 Method 0011A is a high performance liquid chromatographic (HPLC) method optimized for the determination of formaldehyde and acetaldehyde in aqueous environmental matrices and leachates of solid samples and stack samples collected by method 0011. When this method is used to analyze unfamiliar sample matrices, compound identification should be supported by at least one additional qualitative technique. A gas chromatograph/mass spectrometer (GC/MS) may be used for the qualitative confirmation of results from the target analytes, using the extract produced by this method.

3.6.1.3 The method detection limits (MDL) are listed in Tables 3.6-1 and 3.6-2. The MDL for a specific sample may differ from that listed, depending upon the nature of interferences in the sample matrix and the amount of sample used in the procedure.

3.6.1.4 The extraction procedure for solid samples is similar to that specified in method 1311(1). Thus, a single sample may be extracted to measure the analytes included in the scope of other appropriate methods. The analyst is allowed the flexibility to select chromatographic conditions appropriate for the simultaneous measurement of contaminations of these analytes.

Table 3.6-1.—High Performance Liquid Chromatography Conditions and Method Detection Limits Using Solid Sorbent Extraction

Analyte	Retention time (minutes)	MDL ($\mu\text{g/L}$) ¹
Formaldehyde	7.1	7.2

¹ After correction for laboratory blank.

HPLC conditions: Reverse phase C18 column, 4.6 X 250 mm; isocratic elution using methanol/water (75:25, v/v); flow rates 1.0 mL/min.; detector 360 nm.

Table 3.6-2.—High Performance Liquid Chromatography Conditions and Method Detection Limits Using Methylene Chloride Extraction

Analyte	Retention time (minutes)	MDL ($\mu\text{g/L}$) ¹
Formaldehyde	7.1	7.2
Acetaldehyde	8.6	171 ¹

¹ These values include reagent blank concentration of approximately 13 $\mu\text{g/L}$ acetaldehyde.

HPLC conditions: Reverse phase C18 column, 4.6 X 250 mm; isocratic elution using methanol/water (75:25, v/v); flow rates 1.0 mL/min.; detector 360 nm.

3.6.1.5 This method is restricted to use by, or under the supervision of analysts experienced in the use of chromatography and in the interpretation of chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method.

3.6.1.6 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of material safety data sheets should also be made available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available.

3.6.1.7 Formaldehyde has been tentatively classified as a known or suspected, human or mammalian carcinogen.

3.6.2 Summary of Method

3.6.2.1 Environmental Liquids and Solid Leachates.

3.6.2.1.1 For wastes comprised of solids or for aqueous wastes containing significant amounts of solid material, the aqueous phase, if any, is separated from the solid phase and stored for later analysis. If necessary, the particle size of the solids in the waste is reduced. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase of the waste. A special extractor vessel is used when testing for volatiles. Following extraction, the aqueous extract is separated from the solid phase by filtration employing 0.6 to 0.8 μm glass fiber filters.

3.6.2.1.2 If compatible (i.e., multiple phases will not form on combination), the initial aqueous phase of the waste is added to the aqueous extract, and these liquids are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume weighted average concentration.

3.6.2.1.3 A measured volume of aqueous sample or an appropriate amount of solids leachate is buffered to pH 5 and derivatized with 2,4-dinitrophenylhydrazine (DNPH), using either the solid sorbent or the methylene derivatization/extraction option. If the solid sorbent option is used, the derivative is extracted using solid sorbent cartridges, followed by elution with ethanol. If the methylene chloride option is used, the derivative is extracted with methylene chloride. The methylene chloride extracts are concentrated using the Kuderna-Danish (K-D) procedure and solvent exchanged into methanol prior to HPLC analysis. Liquid chromatographic conditions are described which permit the separation and measurement of formaldehyde in the extract by absorbance detection at 360 nm.

3.6.2.2 Stack Gas Samples Collected by Method 0011.

3.6.2.2.1 The entire sample returned to the laboratory is extracted with methylene chloride and the methylene chloride extract is brought up to a known volume. An aliquot of the methylene chloride extract is solvent exchanged and concentrated or diluted as necessary.

3.6.2.2.2 Liquid chromatographic conditions are described that permit the separation and measurement of formaldehyde in the extract by absorbance detection at 360 nm.

3.6.3 Interferences

3.6.3.1 Method interferences may be caused by contaminants in solvents, reagents, glassware, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. All of these materials must be routinely demonstrated to be free from interferences under the conditions of the analysis by analyzing laboratory reagent blanks.

3.6.3.1.1 Glassware must be scrupulously cleaned. Clean all glassware as soon as possible after use by rinsing with the last solvent used. This should be followed by detergent washing with hot water, and rinses with tap water and distilled water. It should then be drained, dried, and heated in a laboratory oven at 130°C for several hours before use. Solvent rinses with methanol may be substituted for the oven heating. After drying and cooling, glassware should be stored in a clean environment to prevent any accumulation of dust or other contaminants.

3.6.3.1.2 The use of high purity reagents and solvents helps to minimize interference problems. Purification of solvents by distillation in all-glass systems may be required.

3.6.3.2 Analysis for formaldehyde is especially complicated by its ubiquitous occurrence in the environment.

3.6.3.3 Matrix interferences may be caused by contaminants that are coextracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature and diversity of the matrix being sampled. No interferences have been observed in the matrices studied as a result of using solid sorbent extraction as opposed to liquid extraction. If interferences occur in subsequent samples, some additional cleanup may be necessary.

3.6.3.4 The extent of interferences that may be encountered using liquid chromatographic techniques has not been fully assessed. Although the HPLC conditions described allow for a resolution of the specific compounds covered by this method, other matrix components may interfere.

3.6.4 Apparatus and Materials

3.6.4.1 Reaction vessel-250 ml Florence flask.

3.6.4.2 Separatory funnel-205 ml, with Teflon stopcock.

3.6.4.3 Kuderna-Danish (K-D) apparatus.

3.6.4.3.1 Concentrator tube-10 ml graduated (Kontes K-570050-1025 or equivalent). A ground glass stopper is used to prevent evaporation of extracts.

3.6.4.3.2 Evaporation flask-500 ml (Kontes K-570001-500 or equivalent). Attach to concentrator tube with springs, clamps, or equivalent.

3.6.4.3.3 Snyder column-Three ball macro (Kontes K-503000-0121 or equivalent).

3.6.4.3.4 Snyder column-Two ball macro (Kontes K-569001-0219 or equivalent).

3.6.4.3.5 Springs- ½ inch (Kontes K-662750 or equivalent).

- 3.6.4.4 Vials-10, 25 ml, glass with Teflon lined screw caps or crimp tops.
- 3.6.4.5 Boiling chips-Solvent extracted with methylene chloride, approximately $^{10}/_{40}$ mesh (silicon carbide or equivalent).
- 3.6.4.6 Balance-Analytical, capable of accurately weighing to the nearest 0.0001 g.
- 3.6.4.7 pH meter-Capable of measuring to the nearest 0.01 units.
- 3.6.4.8 High performance liquid chromatograph (modular).
 - 3.6.4.8.1 Pumping system-Isocratic, with constant flow control capable of 1.00 ml/min.
 - 3.6.4.8.2 High pressure injection valve with 20 μ L loop.
 - 3.6.4.8.3 Column-250 mm \times 4.6 mm ID, 5 μ m particle size, C18 (or equivalent).
 - 3.6.4.8.4 Absorbance detector-360 nm.
 - 3.6.4.8.5 Strip-chart recorder compatible with detector-Use of a data system for measuring peak areas and retention times is recommended.
- 3.6.4.9 Glass fiber filter paper.
- 3.6.4.10 Solid sorbent cartridges-Packed with 500 mg C18 (Baker or equivalent).
- 3.6.4.11 Vacuum manifold-Capable of simultaneous extraction of up to 12 samples (Supelco or equivalent).
- 3.6.4.12 Sample reservoirs-60 ml capacity (Supelco or equivalent).
- 3.6.4.13 Pipet-Capable of accurately delivering 0.10 ml solution (Pipetman or equivalent).
- 3.6.4.14 Water bath-Heated, with concentric ring cover, capable of temperature control (\pm 2 $^{\circ}$ C). The bath should be used under a hood.
- 3.6.4.15 Volumetric Flasks-250 or 500 ml.

3.6.5 Reagents

3.6.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.6.5.2 Organic-free water-All references to water in this method refer to organic-free reagent water, as defined in chapter I SW-846.

- 3.6.5.3 Methylene chloride, CH_2Cl_2 -HPLC grade or equivalent.
- 3.6.5.4 Methanol, CH_3OH -HPLC grade or equivalent.
- 3.6.5.5 Ethanol (absolute), $\text{CH}_3\text{CH}_2\text{OH}$ -HPLC grade or equivalent.
- 3.6.5.6 2,4-Dinitrophenylhydrazine (DNPH) (70% (W/W)), $[\text{2,4-(O}_2\text{N)}_2\text{C}_6\text{H}_3]\text{NHNH}_2$, in organic-free reagent water.
- 3.6.5.7 Formalin (37.6 percent (w/w)), formaldehyde in organic-free reagent water.
- 3.6.5.8 Acetic acid (glacial), $\text{CH}_3\text{CO}_2\text{H}$.
- 3.6.5.9 Sodium hydroxide solutions NaOH, 1.0 N and 5 N.
- 3.6.5.10 Sodium chloride, NaCl.
- 3.6.5.11 Sodium sulfite solution, Na_2SO_3 , 0.1 M.
- 3.6.5.12 Hydrochloric Acid, HCl, 0.1 N.
- 3.6.5.13 Extraction fluid-Dilute 64.3 ml of 1.0 N NaOH and 5.7 ml glacial acetic acid to 900 ml with organic-free reagent water. Dilute to 1 liter with organic-free reagent water. The pH should be 4.93 ± 0.02 .
- 3.6.5.14 Stock standard solutions.
 - 3.6.5.14.1 Stock formaldehyde (approximately 1.00 mg/ml)-Prepare by diluting 265 μ l formalin to 100 ml with organic-free reagent water.

3.6.5.14.1.1 Standardization of formaldehyde stock solution-Transfer a 25 ml aliquot of a 0.1 M Na₂SO₃ solution to a beaker and record the pH. Add a 25.0 ml aliquot of the formaldehyde stock solution (section 3.6.5.14.1) and record the pH. Titrate this mixture back to the original pH using 0.1 N HCl. The formaldehyde concentration is calculated using the following equation:

$$\text{Concentration (mg/ml)} = 30.03 \times (\text{N HCl}) \times (\text{ml HCl}) 25.0$$

where:

N HCl = Normality of HCl solution used.

ml HCl = ml of standardized HCl solution used.

30.03 = MW of formaldehyde.

3.6.5.14.2 Stock formaldehyde and acetaldehyde-Prepare by adding 265 μ L formalin and 0.1 g acetaldehyde to 90 ml of water and dilute to 100 ml. The concentration of acetaldehyde in this solution is 1.00 mg/ml. Calculate the concentration of formaldehyde in this solution using the results of the assay performed in section 3.6.5.14.1.1.

3.6.5.14.3 Stock standard solutions must be replaced after six months, or sooner, if comparison with check standards indicates a problem.

3.6.5.15 Reaction Solutions.

3.6.5.15.1 DNPH (1.00 μ g/L)-Dissolve 142.9 mg of 70% (w/w) reagent in 100 ml absolute ethanol. Slight heating or sonication may be necessary to effect dissolution.

3.6.5.15.2 Acetate buffer (5 N) Prepare by neutralizing glacial acetic acid to pH 5 with 5 N NaOH solution. Dilute to standard volume with water.

3.6.5.15.3 Sodium chloride solution (saturated) Prepare by mixing of the reagent grade solid with water.

3.6.6 Sample Collection, Preservation, and Handling

3.6.6.1 See the introductory material to this Chapter, Organic Analytes, section 4.1 of SW-846.

3.6.6.2 Environmental liquid and leachate samples must be refrigerated at 4 °C, and must be derivatized within 5 days of sample collection and analyzed within 3 days of derivatization.

3.6.6.3 Stack gas samples collected by Method 0011 must be refrigerated at 4 °C. It is recommended that samples be extracted within 30 days of collection and that extracts be analyzed within 30 days of extraction.

3.6.7 Procedure

3.6.7.1 Extraction of Solid Samples.

3.6.7.1.1 All solid samples should be homogeneous. When the sample is not dry, determine the dry weight of the sample, using a representative aliquot.

3.6.7.1.1.1 Determination of dry weight-In certain cases, sample results are desired based on a dry weight basis. When such data is desired, or required, a portion of sample for dry weight determination should be weighed out at the same time as the portion used for analytical determination.

Warning: The drying oven should be contained in a hood or vented. Significant laboratory contamination may result from drying a heavily contaminated hazardous waste sample.

3.6.7.1.1.2 Immediately after weighing the sample for extraction, weigh 5-10 g of the sample into a tared crucible. Determine the % dry weight of the sample by drying overnight at 105 °C. Allow to cool in a desiccator before weighing:

$$\% \text{ of dry weight} = \frac{\text{g of dry sample}}{\text{g of sample}} \times 100$$

3.6.7.1.2 Measure 25 g of solid into a 500 ml bottle with a Teflon lined screw cap or crimp top, and add 500 ml of extraction fluid (section 3.6.5.13). Extract the solid by rotating the

bottle at approximately 30 rpm for 18 hours. Filter the extract through glass fiber paper and store in sealed bottles at 4 °C. Each ml of extract represents 0.050 g solid.

3.6.7.2 Cleanup and Separation.

3.6.7.2.1 Cleanup procedures may not be necessary for a relatively clean sample matrix. The cleanup procedures recommended in this method have been used for the analysis of various sample types. If particular circumstances demand the use of an alternative cleanup procedure, the analyst must determine the elution profile and demonstrate that the recovery of formaldehyde is no less than 85% of recoveries specified in Table 3.6-3. Recovery may be lower for samples which form emulsions.

3.6.7.2.2 If the sample is not clean, or the complexity is unknown, the entire sample should be centrifuged at 2500 rpm for 10 minutes. Decant the supernatant liquid from the centrifuge bottle, and filter through glass fiber filter paper into a container which can be tightly sealed.

3.6.7.3 Derivatization.

3.6.7.3.1 For aqueous samples, measure a 50 to 100 ml aliquot of the sample. Quantitatively transfer the sample aliquot to the reaction vessel (section 3.6.4.1).

3.6.7.3.2 For solid samples, 1 to 10 ml of leachate (section 3.6.7.1) will usually be required. The amount used for a particular sample must be determined through preliminary experiments.

Table 3.6-3.—Single Operator Accuracy and Precision Using Solid Sorbent Extraction

Analyte	Matrixtype	Average percent recovery	Standard deviation percent	Spike range (µg/L)	No. of analyses
Formaldehyde	Reagent water	86	9.4	15–1430	39
	Final effluent	90	11.0	46.8–1430	16
	Phenol formaldehyde sludge	93	12.0	457–1430	15

Note: For all reactions, the total volume of aqueous layer should be adjusted to 100 ml with water.

3.6.7.3.3 Derivatization and extraction of the derivative can be accomplished using the solid sorbent (section 3.6.7.3.4) or methylene chloride option (section 3.6.7.3.5).

3.6.7.3.4 Solid Sorbent Option.

3.6.7.3.4.1 Add 4 ml of acetate buffer and adjust the pH to 5.0 ± 0.1 with glacial acetic acid or 5 N NaOH. Add 6 ml of DNPH reagent, seal the container, and place on a wrist-action shaker for 30 minutes.

3.6.7.3.4.2 Assemble the vacuum manifold and connect to a water aspirator or vacuum pump. Assemble solid sorbent cartridges containing a minimum of 1.5 g of C18 sorbent, using connectors supplied by the manufacturer, and attach the sorbent train to the vacuum manifold. Condition each cartridge by passing 10 ml dilute acetate buffer (10 ml 5 N acetate buffer dissolved in 250 ml water) through the sorbent cartridge train.

3.6.7.3.4.3 Remove the reaction vessel from the shaker and add 10 ml saturated NaCl solution to the vessel.

3.6.7.3.4.4 Add the reaction solution to the sorbent train and apply a vacuum so that the solution is drawn through the cartridges at a rate of 3 to 5 ml/min. Release the vacuum after the solution has passed through the sorbent.

3.6.7.3.4.5 Elute each cartridge train with approximately 9 ml of absolute ethanol, directly into a 10 ml volumetric flask. Dilute the solution to volume with absolute ethanol, mixed thoroughly, and place in a tightly sealed vial until analyzed.

3.6.7.3.5 Methylene Chloride Option.

3.6.7.3.5.1 Add 5 ml of acetate buffer and adjust the pH to 5.0 ± 0.5 with glacial acetic acid or 5 N NaOH. Add 10 ml of DNPH reagent, seal the container, and place on a wrist-action shaker for 1 hour.

3.6.7.3.5.2 Extract the solution with three 20 ml portions of methylene chloride, using a 250 ml separatory funnel, and combine the methylene chloride layers. If an emulsion forms upon extraction, remove the entire emulsion and centrifuge at 2000 rpm for 10 minutes. Separate the layers and proceed with the next extraction.

3.6.7.3.5.3 Assemble a Kuderna-Danish (K-D) concentrator by attaching a 10 ml concentrator tube to a 500 ml evaporator flask. Wash the K-D apparatus with 25 ml of extraction solvent to complete the quantitative transfer.

3.6.7.3.5.4 Add one to two clean boiling chips to the evaporative flask and attach a three ball Snyder column. Preset the Snyder column by adding about 1 ml methylene chloride to the top. Place the K-D apparatus on a hot water bath (80–90 °C) so that the concentrator tube is partially immersed in the hot water and the entire lower rounded surface of the flask is bathed with hot vapor. Adjust the vertical position of the apparatus and the water temperature, as required, to complete the concentration in 10–15 min. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood with condensed solvent. When the apparent volume of liquid reaches 10 ml, remove the K-D apparatus and allow it to drain and cool for a least 10 min.

3.6.7.3.5.5 Prior to liquid chromatographic analysis, the solvent must be exchanged to methanol. The analyst must ensure quantitative transfer of the extract concentrate. The exchange is performed as follows:

3.6.7.3.5.5.1 Following K-D concentration of the methylene chloride extract to <10 ml using the macro Snyder column, allow the apparatus to cool and drain for at least 10 minutes.

3.6.7.3.5.5.2 Momentarily remove the Snyder column, add 5 ml of the methanol, a new glass bed, or boiling chip, and attach the micro Snyder column. Concentrate the extract using 1 ml of methanol to prewet the Snyder column. Place the K-D apparatus on the water bath so that the concentrator tube is partially immersed in the hot water. Adjust the vertical position of the apparatus and the water temperature, as required, to complete concentration. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood. When the apparent volume of liquid reaches <5 ml, remove the K-D apparatus and allow it to drain and cool for at least 10 minutes.

3.6.7.3.5.5.3 Remove the Snyder column and rinse the flask and its lower joint with 1-2 ml of methanol and add to concentrator tube. A 5-ml syringe is recommended for this operation. Adjust the extract volume to 10 ml. Stopper the concentrator tube and store refrigerated at 4 °C if further processing will not be performed immediately. If the extract will be stored longer than two days, it should be transferred to a vial with a Teflon-lined screw cap or crimp top. Proceed with liquid chromatographic analysis if further cleanup is not required.

3.6.7.4 Extraction of Stack Gas Samples Collected by Method 0011.

3.6.7.4.1 Measure the aqueous volume of the sample prior to extraction (for moisture determination in case the volume was not measured in the field). Pour the sample into a separatory funnel and drain the methylene chloride into a volumetric flask.

3.6.7.4.2 Extract the aqueous solution with two or three aliquots of methylene chloride. Add the methylene chloride extracts to the volumetric flask.

3.6.7.4.3 Fill the volumetric flask to the line with methylene chloride. Mix well and remove an aliquot.

3.6.7.4.4 If high levels of formaldehyde are present, the extract can be diluted with mobile phase, otherwise the extract must be solvent exchanged as described in section 3.6.7.5.3.3. If low levels of formaldehyde are present, the sample should be concentrated during the solvent exchange procedure.

3.6.7.5 Chromatographic Conditions.

Column C18, 250 mm × 4.6 mm ID, 5 μ m particle size

Mobile Phase methanol/water, 75:25 (v/v), isocratic

Flow Rate 1.0 ml/min

UV Detector 360 nm

Injection Volume 20 μ l

3.6.7.6 Calibration.

3.6.7.6.1 Establish liquid chromatographic operating parameters to produce a retention time equivalent to that indicated in Table 3.6-1 for the solid sorbent options, or in Table 3.6-2 for methylene chloride option. Suggested chromatographic conditions are provided in section 3.6.7.5. Prepare derivatized calibration standards according to the procedure in section 3.6.7.6.1.1. Calibrate the chromatographic system using the external standard technique (section 3.6.7.6.1.2).

3.6.7.6.1.1 Preparation of calibration standards.

3.6.7.6.1.1.1 Prepare calibration standard solutions of formaldehyde and acetaldehyde in water from the stock standard (section 3.6.5.14.2). Prepare these solutions at the following concentrations (in μ g/ml) by serial dilution of the stock standard solution: 50, 20, 10. Prepare additional calibration standard solutions at the following concentrations, by dilution of the appropriate 50, 20, or 10 μ g/ml standard: 5, 0.5, 2, 0.2, 1, 0.1.

3.6.7.6.1.1.2 Process each calibration standard solution through the derivatization option used for sample processing (section 3.6.7.3.4 or 3.6.7.3.5).

3.6.7.6.1.2 External standard calibration procedure.

3.6.7.6.1.2.1 Analyze each derivatized calibration standard using the chromatographic conditions listed in Tables 3.6-1 and 3.6-2, and tabulate peak area against concentration injected. The results may be used to prepare calibration curves for formaldehyde and acetaldehyde.

3.6.7.6.1.2.2 The working calibration curve must be verified on each working day by the measurement of one or more calibration standards. If the response for any analyte varies from the previously established responses by more than 10%, the test must be repeated using a fresh calibration standard after it is verified that the analytical system is in control. Alternatively, a new calibration curve may be prepared for that compound. If an autosampler is available, it is convenient to prepare a calibration curve daily by analyzing standards along with test samples.

3.6.7.7 Analysis.

3.6.7.7.1 Analyze samples by HPLC, using conditions established in section 3.6.7.6.1. Tables 3.6-1 and 3.6-2 list the retention times and MDLs that were obtained under these conditions. Other HPLC columns, chromatographic conditions, or detectors may be used if the requirements for section 3.6.8.1 are met, or if the data are within the limits described in Tables 3.6-1 and 3.6-2.

3.6.7.7.2 The width of the retention time window used to make identifications should be based upon measurements of actual retention time variations of standards over the course of a day. Three times the standard deviation of a retention time for a compound can be used to calculate a suggested window size; however, the experience of the analyst should weigh heavily in the interpretation of the chromatograms.

3.6.7.7.3 If the peak area exceeds the linear range of the calibration curve, a smaller sample volume should be used. Alternatively, the final solution may be diluted with ethanol and reanalyzed.

3.6.7.7.4 If the peak area measurement is prevented by the presence of observed interferences, further cleanup is required. However, none of the 3600 method series have been evaluated for this procedure.

3.6.7.8 Calculations.

3.6.7.8.1 Calculate each response factor as follows (mean value based on 5 points):

$$RF = \frac{\text{concentration of standard}}{\text{area of the signal}}$$
$$\text{mean} = RF = \frac{\sum_{i=1}^5 RF_i}{5}$$

3.6.7.8.2 Calculate the concentration of formaldehyde and acetaldehyde as follows:
 $\mu\text{g/ml} = (\text{RF}) (\text{area of signal}) (\text{concentration factor})$

where:

$$\text{concentration factor} = \frac{\text{Final Volume of Extract}}{\text{Initial Extract Volume}}$$

3.6.7.8.2 Note: For solid samples, a dilution factor must be included in the equation to account for the weight of the sample used.

3.6.7.8.3 Calculate the total weight of formaldehyde in the stack gas sample as follows:
 $\text{total } \mu\text{g/ml} = (\text{RF}) (\text{area of signal}) (\text{concentration factor})$

where:

$$\text{concentration factor} = \frac{\text{Final Volume of Extract}}{\text{Initial Extract Volume}}$$

3.6.8 Quality Control

3.6.8.1 Refer to Chapter One of SW-846 for guidance on quality control procedures.

3.6.9 Method Performance

3.6.9.1 The MDL concentrations listed in Table 3.6-1 were obtained using organic-free water and solid sorbent extraction. Similar results were achieved using a final effluent and sludge leachate. The MDL concentrations listed in Table 3.6-2 were obtained using organic-free water and methylene chloride extraction. Similar results were achieved using representative matrices.

3.6.9.2 This method has been tested for linearity of recovery from spiked organic-free water and has been demonstrated to be applicable over the range from $2 \times \text{MDL}$ to $200 \times \text{MDL}$.

3.6.9.3 In a single laboratory evaluation using several spiked matrices, the average recoveries presented in Tables 3.6-3 and 3.6-4 were obtained using solid sorbent and methylene chloride extraction, respectively. The standard deviations of the percent recovery are also included in Tables 3.6-3 and 3.6-4.

3.6.9.4 A representative chromatogram is presented in Figure 3.6-1.

3.6.10 References

1. Federal Register, 1986, 51, 40643-40652; November 7.
2. EPA Methods 6010, 7000, 7041, 7060, 7131, 7421, 7470, 7740, and 7841, Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. SW-846, Third Edition. September 1988. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC 20460.

Table 3.6-4.—Single Operator Accuracy and Precision Using Methylene Chloride Extraction

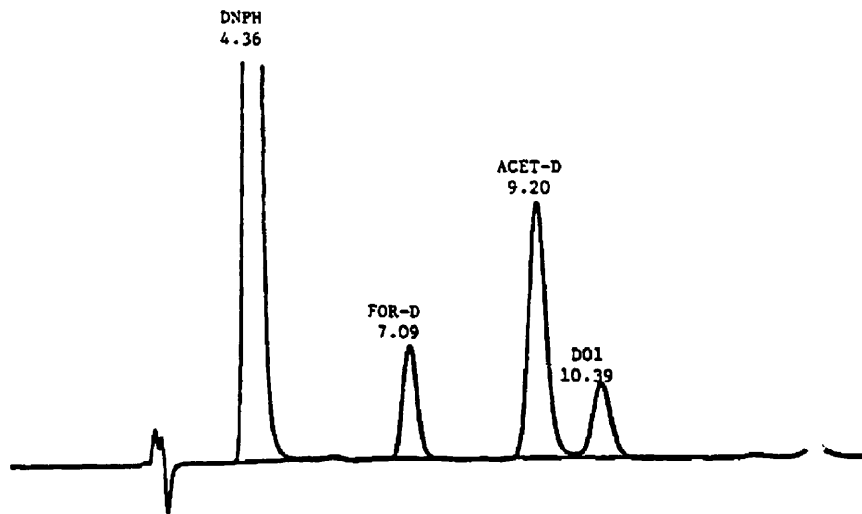
Analyte	Matrix type	Average percent recovery (x)	Standard deviation percent (p)	Spike range ($\mu\text{g/L}$)	No. of analyses
Formaldehyde	Reagent Water	91	2.5	50-1000	9
	Groundwater	92.5	8.2	50	6
	Liquids	69.6	16.3	250	12
Acetaldehyde	Reagent Water	60.3	3.2	50-1000	9
	Groundwater	63.6	10.9	50	12
	Liquids (2 types)	44.0	20.2	250	12
	Solids	58.4	2.7	0.10-1.0*	12

FOOTNOTE: * Spike range in units of mg/g.

FOOTNOTE: x = Average recovery expected for this method.

FOOTNOTE: p = Average standard deviation expected for this method.

FIGURE 3.6-1
REPRESENTATIVE CHROMATOGRAM OF A 50 $\mu\text{g/L}$ SOLUTION OF FORMALDEHYDE



FOR-D = Formaldehyde derivative
ACET-D = Acetaldehyde derivative

Section 4.0. PROCEDURE FOR ESTIMATING THE TOXICITY EQUIVALENCY OF CHLORINATED DIBENZO-P-DIOXIN AND DIBENZOFURAN CONGENERS

PCDDs and PCDFs must be determined using the method given in section 3.4 of this document. In this method, individual congeners or homologues¹ are measured and then summed to yield a total PCDD/PCDF value. No toxicity factors are specified in the method to compute risks from such emissions.

¹ FOOTNOTE: The term "congener" refers to any one particular member of the same chemical family; e.g., there are 75 congeners of chlorinated dibenzo-p-dioxins. The term "homologue" refers to a group of structurally related chemicals that have the same degree of chlorination. For example, there are eight homologues of CDs, monochlorinated through octachlorinated. Dibenzop-dioxins and dibenzofurans that are chlorinated at the 2,3,7, and 8 positions are denoted as "2378" congeners, except when 2,3,7,8-TCDD is uniquely referred to: e.g., 1,2,3,7,8-PeCDF and 2,3,4,7,8- PeCDF are both referred to as "2378-PeCDFs."

For the purpose of estimating risks posed by emissions from boilers and industrial furnaces, however, specific congeners and homologues must be measured using the specified method and then multiplied by the assigned toxicity equivalence factors (TEFs), using procedures described in "Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzop-Dioxins and Dibenzofurans (CDDs and CDFs) and 1989 Update," EPA/625/3-89/016, March 1989. The resulting 2,3,7,8-TCDD equivalents value is used in the subsequent risk calculations and modeling efforts as discussed in the BIF final rule.

The procedure for calculating the 2,3,7,8-TCDD equivalent is as follows:

1. Using method 23, determine the concentrations of 2,7,3,8-congeners of various PCDDs and PCDFs in the sample.
2. Multiply the congener concentrations in the sample by the TEF listed in Table 4.0-1 to express the congener concentrations in terms of 2,3,7,8-TCDD equivalent. Note that congeners not chlorinated at 2,3,7, and 8 positions have a zero toxicity factor in this table.
3. Add the products obtained in step 2, to obtain the total 2,3,7,8-TCDD equivalent in the sample.

Sample calculations are provided in EPA document No. EPA/625/3-89/016, March 1989, which can be obtained from the EPA, ORD Publications Office, Cincinnati, Ohio (Phone no. 513-569-7562).

Table 4.0-1.-2,3,7,8-TCDD Toxicity Equivalence Factors (TEFs)¹

Compound	I-TEFs, 89
Mono-, Di-, and TriCDDs	0
2,3,7,8-TCDD	1
Other TCDDs	0
2,3,7,8-PeCDD	0.5
Other PeCDDs	0
2,3,7,8-HxCDD	0.1
Other HxCDDs	0
2,3,7,8-HpCDD	0.01
Other HpCDDs	0
OCDD	0.001
Mono-, Di-, and TriCDFs	0
2,3,7,8-TCDF	0.1
Other TCDFs	0
1,2,3,7,8-PeCDF	0.05
2,3,4,7,8-PeCDF	0.5
Other PeCDFs	0
2378-HxCDFs	0.1
Other HxCDFs	0
2378-HpCDFs	0.01
Other HpCDFs	0
OCDF	0.001

Reference: Adopted from NATO/CCMS, 1988a.

¹ FOOTNOTE: Interim Procedures for Estimating Risks Associated with Exposures to Mixtures of Chlorinated Dibenzo-p-Dioxins and Dibenzofurans (CDDs and CDFs) 1989 Update EPA/625/3-89/016, March 1989.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Section 5.0. HAZARDOUS WASTE COMBUSTION AIR QUALITY SCREENING PROCEDURE

The HWCAQSP is a combined calculation/reference table approach for conservatively estimating short-term and annual average facility impacts for stack emissions. The procedure is based on extensive short-term modeling of 11 generic source types and on a set of adjustment factors for estimating annual average concentrations from short-term concentrations. Facility impacts may be determined based on the selected worst-case stack or on multiple stacks, in which the impacts from each stack are estimated separately and then added to produce the total facility impact.

This procedure is most useful for facilities with multiple stacks, large source-to-property boundary distances, and complex terrain between 1 and 5 km from the facility. To ensure a sufficient degree of conservatism, the HWCAQSP may not be used if any of the five screening procedure limitations listed below are true:

- The facility is located in a narrow valley less than 1 km wide;
- The facility has a stack taller than 20 m and is located such that the terrain rises to the stack height within 1 km of the facility;
- The facility has a stack taller than 20 m and is located within 5 km of the shoreline of a large body of water;
- The facility property line is within 200 m of the stack and the physical stack height is less than 10 m; or
- On-site receptors are of concern, and stack height is less than 10 m.

If any of these criteria are met or the Department determines that this procedure is not appropriate, then detailed site-specific modeling or modeling using the "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources," EPA -450/4-88-010, Office of Air Quality Planning and Standards, August 1988, is required. Detailed site-specific dispersion modeling must conform to the EPA "Guidance on Air Quality Models (Revised)", EPA 450/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July 1986. This document provides guidance on both the proper selection and regulatory application of air quality models.

Introduction

The Hazardous Waste Combustion Air Quality Screening Procedure (HWCAQSP) (also referred to hereafter as "the screening procedure" or "the procedure") provides a quick, easy method for estimating maximum (hourly) and annual average ambient air impacts associated with the combustion of hazardous waste. The methodology is conservative in nature and estimates dispersion coefficients ¹ based on facility-specific information.

The screening procedure can be used to determine emissions limits at sites where the nearest meteorological (STAR) station is not representative of the meteorology at the site. If the screen shows that emissions from the site are adequately protective, then the need to collect site-specific meteorological data can be eliminated.

The screening procedure is generally most helpful for facilities meeting one or more of the following conditions:

- Multiple stacks with substantially different release specifications (e.g., stack heights differ by ≥ 50 percent, exit temperatures differ by ≥ 50 °K, or the exit flow rates differ by more than a factor of 2),
- Terrain located between 1 km and 5 km from the site increases in elevation by more than the physical height of the shortest stack (i.e., the facility is located in complex terrain), or

¹ FOOTNOTE: The term dispersion coefficient refers to the change in ambient air concentration ($\mu\text{g}/\text{m}^3$) resulting from a source with an emission rate of 1 g/sec.

●Significant distance between the facility’s stacks and the site boundary [guidance on determining whether a distance is “significant” is provided in Step 6(B) of the procedure].

Steps 1 through 9 of the screening procedure present a simplified method for determining emissions based on the use of the “worst-case” stack. If the simplified method shows that desired feed rates result in emissions that exceed allowable limits for one or more pollutants, a refined analysis to examine the emissions from each stack can be conducted. This multiple-stack method is presented in Step 10.

The steps involved in screening methodology are as follows:

- Step 1. Define Source Characteristics
- Step 2. Determine the Applicability of the Screening Procedure
- Step 3. Select the Worst-Case Stack
- Step 4. Verify Good Engineering Practice (GEP) Criteria
- Step 5. Determine the Effective Stack Height and Terrain-Adjusted Effective Stack Height
- Step 6. Classify the Site as Urban or Rural
- Step 7. Determine Maximum Dispersion Coefficients
- Step 8. Estimate Maximum Ambient Air Concentrations
- Step 9. Determine Compliance With Regulatory Limits
- Step 10. Multiple Stack Method

Step 1: Define Source Characteristics

Provide the following source data: ²

FOOTNOTE: ² Worksheet space is provided for three stacks, if the facility has additional stacks, copy the form and revise stack identification numbers for 4, 5, etc.

Stack Data:	Stack No. 1	Stack No. 2	Stack No. 3
Physical stack height (m)	_____	_____	_____
Exhaust temperature (°K)	_____	_____	_____
Flow rate (m/sec)	_____	_____	_____

Nearby Building Dimensions

Consider all buildings within five building heights or five maximum projected widths of the stack(s). For the building with the greatest height, fill in the spaces below.

Building Height (m)_____

Maximum projected building width (m)_____

Nearby Terrain Data

Determine maximum terrain rise for the following three distance ranges from the facility (not required if the highest stack is less than 10 m in height):

_____ (m) _____ (m) _____ (m)

0–0.5 km 0–2.5 km 0–5 km

Distance from facility to nearest shoreline (km)_____

Valley width (km)_____

Step 2: Determine the Applicability of the Screening Procedure

Fill in the following data:

	Yes	No
Is the facility in a valley < km in width?	_____	_____
Is the terrain rise within 1 km of the facility greater than the physical stack height of the tallest stack? (Only applies to stacks ≤20 meters in height)	_____	_____
Is the distance to the nearest shoreline <5 km? (Only applies to facilities with stacks ≤20 meters in height)	_____	_____
For the building listed in Step 1, is the closest property boundary <5 times the building height or <5 times the maximum projected building width? (Only applies to facilities with a stack height <2.5 times the building height)	_____	_____

If the answer is “no” to all the preceding questions, then the HWCAQSP is acceptable. If the answer to any question is “yes”, the procedure is not acceptable.

Step 3: Select the Worst-Case Stack

If the facility has several stacks, a worst-case stack must be chosen to conservatively represent release conditions at the facility. Follow the steps below to identify the worst-case stack.

Apply the following equation to each stack:

$$K = HVT$$

where:

- K= an arbitrary parameter accounting for the relative influence of the stack height and plume rise.
- H= Physical stack height (m)
- V= Flow rate (m/sec)
- T= Exhaust temperature (K)

Complete the following table to compute the “K” value for each stack:

Stack No.	Stack height (m)	X Flow rate (m/sec)	X Exit temp (°K)	=	K
1		X	X	=	
2		X	X	=	
3		X	X	=	

Select the stack with the lowest “K” value. This is the worst-case stack that will be used for Steps 4 through 9.

Worst-Case Stack is identified as Stack No. ____

Step 4: Verify Good Engineering Practice (GEP) Criteria

Confirm that the selected worst-case stack meets Good Engineering Practice (GEP) criteria. The stack height to be used in the subsequent steps of this procedure must not be greater than the maximum GEP. Maximum and minimum GEP stack heights are defined as follows:

$$\text{CEP (minimum)} = H + (1.5 \times L)$$

$$\text{GEP (maximum)} = \text{greater of } 65 \text{ m or } H + (1.5 \times L)$$

where:

H= height of the building selected in Step 1 measured from ground level elevation at the base of the stack

L= the lesser dimension of the height or projected width of the building selected in Step 1

Record the following data for the worst-case stack:

Stack height (m) = _____

H(m) = _____

L(m) = _____

Then compute the following:

GEP (minimum) (m) = _____

GEP (maximum) (m) = _____

- If the physical height of the worst-case stack exceeds the maximum GEP, then use the maximum GEP stack height for the subsequent steps of this analysis;
- If the physical height of the worst-case stack is less than the minimum GEP, then use generic source number 11 as the selected source for further analysis and proceed directly to Step 6;
- If the physical height of the worst-case stack is between the minimum and maximum GEP, then use the actual physical stack height for the subsequent steps of this analysis.

Step 5: Determine the Effective Stack Height and the Terrain-Adjusted Effective Stack Height (TAESH)

The effective stack height is an important factor in dispersion modeling. The effective stack height is the physical height of the stack plus plume rise. As specified in Step 4, the stack height used to estimate the effective stack height must not exceed GEP requirements. Plume rise is a function of the stack exit gas temperature and flow rate.

In this analysis, the effective stack height is used to select the generic source that represents the dispersion characteristics of the facility. For facilities located in flat terrain and for all facilities with worst-case stacks less than or equal to 10 meters in height, generic source numbers are selected strictly on the basis of effective stack height. In all other cases, the effective stack height is further adjusted to take into account the terrain rise near the facility. This "terrain-adjusted effective stack height" (TAESH) is then used to select the generic source number that represents the dispersion characteristics of the facility. Follow the steps below to identify the effective stack height, the TAESH (where applicable), and the corresponding generic source number.

(A) Go to Table 5.0-1 and find the plume rise value corresponding to the stack temperature and exit flow rate for the worst-case stack determined in Step 3.

Plume rise = _____(m)

(B) Add the plume rise to the GEP stack height of the worst-case stack determined in Steps 3 and 4.

GEP stack height (m)	+	Plume rise (m)	=	Effective stack height(m)
_____	+	_____	=	_____

(C) Go to the first column of Table 5.0-2 and identify the range of effective stack heights that includes the effective stack height estimated in Step 5(B). Record the generic source number that corresponds to this range. Generic source number = _____

(D) If the source is located in flat terrain³, or if the generic source number identified in Step 5(C) above is 1 or 11 (regardless of terrain classification), use the generic source number determined in Step 5(C) and proceed directly to Step 6. Otherwise, continue to Step 5(E).

(E) For those situations where the conditions in Step 5(D) do not apply, the effective stack height must be adjusted for terrain. The TAESH for each distance range is computed by subtracting the terrain rise within the distance range from the effective stack height.⁴

FOOTNOTE: ³ The terrain is considered flat and terrain adjustment factors are not used if the maximum terrain rise within 5 km of the facility (see Step 1) is less than 10 percent of the physical stack height of the worst-case stack.

FOOTNOTE: ⁴ Refer to Step 1 for terrain adjustment data. Note that the distance from the source to the outer radii of each range is used. For example, for the range >0.5–2.5 km, the maximum terrain rise in the range 0.0–2.5 km is used.

Table 5.0–1.–Estimated Plume Rise (in Meters) Based on Stack Exit Flow Rate and Gas Temperature

Flow rate (m ³ /s)	Exhaust Temperature (°K)										
	<325 349	325– 399	350– 399	400– 449	450– 499	500– 599	600– 699	700– 799	800– 999	1000– 1499	>1499
<0.5	0	0	0	0	0	0	0	0	0	0	0
0.5–0.9	0	0	0	0	0	0	0	0	1	1	1
1.0–1.9	0	0	0	0	1	1	2	3	3	3	4
2.0–2.9	0	0	1	3	4	4	6	6	7	8	9
3.0–3.9	0	1	2	5	6	7	9	10	11	12	13
4.0–4.9	1	2	4	6	8	10	12	13	14	15	17
5.0–7.4	2	3	5	8	10	12	14	16	17	19	21
7.5–9.9	3	5	8	12	15	17	20	22	22	23	24
10.0–12.4	4	6	10	15	19	21	23	24	25	26	27
12.5–14.9	4	7	12	18	22	23	25	26	27	28	29
15.0–19.9	5	8	13	20	23	24	26	27	28	29	31
20.0–24.9	6	10	17	23	25	27	29	30	31	32	34
25.0–29.9	7	12	20	25	27	29	31	32	33	35	36
30.0–34.9	8	14	22	26	29	31	33	35	36	37	39
35.0–39.9	9	16	23	28	30	32	35	36	37	39	41
40.0–49.9	10	17	24	29	32	34	36	38	39	41	42
50.0–59.9	12	21	26	31	34	36	39	41	42	44	46
60.0–69.9	14	22	27	33	36	39	42	43	45	47	49
70.0–79.9	16	23	29	35	38	41	44	46	47	49	51
80.0–89.9	17	25	30	36	40	42	46	48	49	51	54
90.0–99.9	19	26	31	38	42	44	48	50	51	53	56
100.0–119.9	21	26	32	39	43	46	49	52	53	55	58
120.0–139.9	22	28	35	42	46	49	52	55	56	59	61
140.0–159.9	23	30	36	44	48	51	55	58	59	62	65
160.0–179.9	25	31	38	46	50	54	58	60	62	65	67
180.0–199.9	26	32	40	48	52	56	60	63	65	67	70
>199.9	26	33	41	49	54	58	62	65	67	69	73

Table 5.0–2–Selection of Generic Source Number

Effective stack height (m)	Generic source No.
<10.0	1
10.0–14.9	2
15.0–19.9	3
20.0–24.9	4
25.0–30.9	5
31.0–41.9	6
42.0–52.9	7
53.0–64.9	8
65.0–122.9	9
113.0+	10
Downwash	11

Table 5.0-3.-Classification of Land Use Types

Type ¹	Description	Urban or rural designation ²
I1	Heavy Industrial	Urban
I2	Light/Moderate Industrial	Urban
C1	Commercial	Urban
R1	Common Residential (Normal Easements)	Rural
R2	Compact Residential (Single Family)	Urban
R3	Compact Residential (Multi-Family)	Rural
R4	Estate Residential (Multi-Acre Plots)	Rural
A1	Metropolitan Natural	Rural
A2	Agricultural	Rural
A3	Undeveloped (Grasses/Weeds)	Rural
A4	Undeveloped (Heavily Wooded)	Rural
A5	Water Surfaces	Rural

FOOTNOTE: ¹ EPA, Guideline on Air Quality Models (Revised), EPA-450/2-78-027, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July, 1986.

FOOTNOTE: ² Auer, August H. Jr., "Correlation of Land Use and Cover with Meteorological Anomalies," Journal of Applied Meteorology, pp. 636-643, 1978.

Distance range (km)	Effective stack-height (m) [see step 5(B)]	Maximum terrain-rise (m) (see step 1)	=	TAESH(m)
0.0-0.5		-	=	
>0.5-2.5		-	=	
>2.5-5.0		-	=	

If the terrain rise for any of the distance ranges is greater than the effective stack height, set the TAESH equal to zero and use generic source number 1 for that distance range.

Record the generic source numbers from Table 5.0-2 based on each of the TAESH values.

Distance range (km)	Generic source No. (after terrain adjustment)
0.0-0.5	_____
>0.5-2.5	_____
>2.5-5.0	_____

Step 6: Classify the Site as Urban or Rural

(A) Classify the land use near the facility as either urban or rural by determining the percentage of urban land use types (as defined in Table 3; for further guidance see the footnoted references) that fell within 3 km of the facility.⁵

FOOTNOTE: ⁵ The delineation of urban and rural areas, can be difficult for the residential-type areas listed in Table 5.0-3. The degree of resolution in Table 5.0-3 for residential areas often cannot be identified without conducting site area inspections. This process can require extensive analysis, which, for many applications, can be greatly streamlined without sacrificing confidence in selecting the appropriate urban or rural classification. The fundamental simplifying assumption is based on the premise that many applications will have clear-cut urban/rural designations, i.e., most will be in rural settings that can be definitively characterized through a review of aerial photographs, zoning maps, or U.S. Geological Survey topographical maps.

Method Used to Estimate Percent Urban Land Use:	Visual	Planimeter
Estimated Percentages	Urban	Rural

If the urban land use percentage is less than or equal to 30 percent based on a visual estimate, or 50 percent based on a planimeter, the local land use is considered rural. Otherwise, the local land use is considered urban.

Classification (check applicable space).	Urban _____	Rural _____
---	----------------	----------------

(B) Based on the TAESH and the urban/rural classification of surrounding land use, use the following table to determine the threshold distance between any stack and the nearest facility boundary.

Terrain adjusted effective stack height range (m)	Distance (m)	
	Urban	Rural
1-9.9	200	200
10-14.9	200	250
15-19.9	200	250
20-24.9	200	350
25-30.9	200	450
31-41.9	200	550
42-52.9	250	800
53-64.9	300	1000
65-112.9	400	1200
113+	700	2500

Record the following information:
 Threshold distance from the table (m): _____
 Minimum distance from any stack to property boundary (m): _____

If the minimum distance between any stack and the nearest facility boundary is greater than the threshold distance, the surrounding buffer distance is considered significant and the facility is likely to benefit from use of the HWCAQSP relative to the Tier I and II limits (see discussion of benefits from using HWCAQSP in introduction section).

Step 7: Determine Maximum Dispersion Coefficients

(A) Determine maximum average hourly dispersion coefficients. Based on the results of Step 6(A), select either Table 5.0-4 (urban) or Table 5.0-5 (rural) to determine the maximum average hourly dispersion coefficient.⁶ For flat terrain [defined in Step 5(D)] and for all sites with generic source numbers 1 or 11, use Step 7(A)(1). For rolling or complex terrain (excluding generic sources numbers 1 and 11), use Step 7(A)(2).

(1) Search down the appropriate generic source number column (based on Step 5(C)), beginning at the minimum fenceline distance listed in Step 6(B).⁷ Record the maximum average hourly dispersion coefficient encountered.

Maximum Average Hourly Dispersion
 Coefficient = _____ ($\mu\text{m/g/sec}$)

(2) For each of the three distance-based generic source numbers listed in Step 5(E), search down the appropriate generic source number columns, beginning at the minimum fenceline distance listed in Step 6(B). Note that different columns may be used for each of the three distance ranges if there is a need for terrain adjustment. Record the maximum dispersion coefficient for each generic source number.

Distance range (km)	Generic source No. [from Step 5(E)]	Maximum dispersion coefficient (µg/m/m/sec)
0.0–0.5	_____	_____
>0.5–2.5	_____	_____
>2.5–5.0	_____	_____
>5.0–20.0	_____	_____

FOOTNOTE: ⁶ For the distance range 6 to 20 kilometers, generic source number 1 is used to conservatively represent the maximum dispersion coefficient.

FOOTNOTE: ⁷ Exclude all distances that are closer to the facility than the property boundary. For example, if the actual distance to the nearest property boundary is 265 meters, begin at the 300 meter distance in Tables 5.0–4 and 5.0–5.

Table 5.0–4.–ISCT Predicated Maximum Concentrations (µG/M³)* for Hazardous Waste Combustors Using Urban Conditions

Distance (KM)	Generic Source # 1 (<10M)	Generic Source # 2 (10M)	Generic Source # 3 (15M)	Generic Source # 4 (20M)	Generic Source # 5 (25M)	Generic Source # 6 (31M)	Generic Source # 7 (42M)	Generic Source # 8 (53M)	Generic Source # 9 (65M)	Generic Source # 10 (113M)	Generic Source # 11 (Down-wash)
0.20	680.1	517.5	368.7	268.7	168.5	129.8	63.4	30.1	18.4	1.6	662.3
0.25	521.9	418.2	303.7	232.5	163.0	124.2	67.6	38.5	19.8	3.2	500.0
0.30	407.7	351.7	256.2	199.0	147.0	118.3	63.5	41.5	25.0	4.2	389.3
0.35	326.2	304.2	221.6	172.7	130.2	107.9	60.0	40.5	27.3	5.4	311.9
0.40	268.5	268.5	195.6	152.5	115.7	97.1	59.6	37.8	27.4	5.8	268.5
0.45	240.8	240.7	175.4	136.7	103.9	87.6	56.6	37.2	26.3	5.8	240.8
0.50	218.5	218.5	159.2	124.1	94.4	79.7	52.9	36.7	24.7	5.8	218.5
0.55	200.3	200.3	145.9	113.8	86.5	73.1	49.2	35.4	24.5	6.6	200.3
0.60	185.1	185.1	134.9	105.1	80.0	67.6	45.8	33.8	24.3	7.1	185.1
0.65	172.2	172.2	125.5	97.8	74.4	62.9	42.7	32.0	23.7	7.4	172.2
0.70	161.2	161.2	117.4	91.6	69.6	58.9	40.1	30.2	22.9	7.5	161.2
0.75	151.6	151.6	110.5	86.1	65.5	55.4	37.7	28.6	22.0	7.5	151.6
0.80	143.2	143.2	104.4	81.4	61.9	52.3	35.6	27.1	21.1	7.4	143.2
0.85	135.8	135.8	99.0	77.2	58.7	49.6	33.8	25.7	20.2	7.2	135.8
0.90	129.2	129.2	94.2	73.4	55.8	47.2	32.1	24.5	19.3	7.0	129.2
0.95	123.3	123.3	89.9	70.1	53.3	45.0	30.7	23.4	18.5	6.8	123.3
1.00	118.0	118.0	86.0	67.0	51.0	43.1	29.4	22.4	17.7	6.5	118.0
1.10	108.8	108.0	79.3	61.8	47.0	39.7	27.1	20.6	16.4	6.5	108.8
1.20	101.1	101.1	73.7	57.4	43.7	36.9	25.2	19.2	15.2	6.4	101.1
1.30	94.6	94.6	68.9	53.7	40.9	34.5	23.5	18.0	14.2	6.3	94.6
1.40	89.0	89.0	64.8	50.6	38.5	32.5	22.1	16.9	13.4	6.1	89.0
1.50	84.1	84.1	61.3	47.8	36.3	30.7	20.9	16.0	12.7	5.9	84.1
1.60	79.8	79.8	58.2	45.4	34.5	29.2	19.9	15.2	12.0	5.6	79.8
1.70	76.0	76.0	55.4	43.2	32.9	27.8	18.9	14.4	11.4	5.4	76.0
1.80	72.7	72.7	53.0	41.3	31.4	26.5	18.1	13.8	10.9	5.2	72.7
1.90	69.6	69.6	50.7	39.6	30.1	25.4	17.3	13.2	10.5	5.0	69.6
2.00	66.9	66.9	48.8	38.0	28.9	24.4	16.7	12.7	10.1	4.8	66.9
2.25	61.1	61.1	44.5	34.7	26.4	22.3	15.2	11.6	9.2	4.4	61.1
2.50	56.4	56.4	41.1	32.1	24.4	20.6	14.0	10.7	8.5	4.1	56.4
2.75	52.6	52.6	38.3	29.9	22.7	19.2	10.0	10.0	7.9	3.8	52.6
3.00	49.3	49.3	35.9	28.0	21.3	18.0	9.4	9.4	7.4	3.6	49.3
4.00	40.2	40.2	29.3	22.8	17.4	14.7	7.6	7.6	6.1	2.9	40.2
5.00	34.5	34.5	25.2	19.6	14.9	12.6	6.6	6.6	5.2	2.5	34.5
6.00	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7	30.7
7.00	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8	27.8
8.00	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
9.00	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8	23.8
10.00	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
15.00	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
20.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.01	15.0

* Based on a 1 Gram/Second Emission Rate

Table 5.0-5.-ISCT Predicated Maximum Concentrations ($\mu\text{G}/\text{M}^3$)* for Hazardous Waste Combustors Using Urban Conditions

Distance (KM)	Generic Source # 1 (<10M)	Generic Source # 2 (10M)	Generic Source # 3 (15M)	Generic Source # 4 (20M)	Generic Source # 5 (25M)	Generic Source # 6 (31M)	Generic Source # 7 (42M)	Generic Source # 8 (53M)	Generic Source # 9 (65M)	Generic Source # 10 (113M)	Generic Source # 11 (Down-wash)
0.20	1771.1	670.3	308.6	176.8	102.8	76.5	28.0	10.1	3.5	0.0	1350.8
0.25	1310.6	678.4	316.9	183.6	104.6	71.8	38.0	17.6	7.9	0.2	1227.3
0.30	1002.3	629.2	303.4	199.1	100.4	75.0	39.7	24.0	12.6	0.8	1119.3
0.35	798.4	589.6	282.3	200.7	117.0	71.1	36.3	25.9	16.8	1.9	1023.8
0.40	656.9	516.5	278.7	194.4	125.2	82.7	25.3	24.6	18.1	3.1	938.9
0.45	621.5	471.1	277.6	184.3	127.5	89.7	35.6	21.7	17.6	4.3	851.8
0.50	633.5	432.4	272.0	172.7	125.7	92.9	34.4	21.6	15.9	5.5	787.8
0.55	630.1	399.2	263.8	168.0	121.6	93.3	38.6	22.1	13.6	6.5	730.6
0.60	616.6	370.4	254.0	169.1	116.2	91.8	42.6	21.7	14.3	6.7	676.4
0.65	596.7	345.4	243.6	168.1	110.3	89.2	45.3	20.9	14.7	6.4	633.4
0.70	573.2	323.4	232.9	165.6	104.5	85.8	47.0	23.3	14.6	5.9	592.0
0.75	546.9	304.0	222.3	162.0	98.8	82.2	47.7	25.5	14.3	5.5	554.6
0.80	520.9	286.8	212.1	157.7	98.8	78.5	47.8	27.1	13.8	5.1	521.1
0.85	495.7	271.5	202.4	153.0	99.0	74.9	47.4	28.3	15.0	4.7	491.8
0.90	471.5	257.8	193.3	148.1	98.6	71.4	46.6	29.1	16.3	4.5	464.2
0.95	448.5	245.4	184.7	143.1	97.6	72.3	45.6	29.6	17.3	4.2	438.9
1.00	426.8	234.2	176.8	138.1	96.3	72.6	44.4	29.8	18.2	4.0	415.8
1.10	387.5	214.7	162.5	128.2	91.9	71.1	41.8	29.5	19.3	3.9	375.0
1.20	353.5	198.4	150.3	119.3	87.4	69.1	39.1	28.6	19.8	4.1	340.3
1.30	323.0	189.6	139.9	111.5	82.9	66.7	36.6	27.5	19.8	4.2	310.4
1.40	296.6	182.2	130.8	104.5	78.7	64.2	34.3	26.2	19.5	4.2	284.6
1.50	273.3	174.6	122.9	98.3	74.7	61.6	32.3	24.9	19.0	4.2	262.0
1.60	252.7	167.0	115.9	92.8	71.0	59.1	31.8	23.6	18.4	4.2	242.2
1.70	234.5	159.6	109.7	87.9	67.6	56.7	31.6	22.5	17.7	4.3	224.7
1.80	218.3	152.4	104.1	83.5	64.4	54.3	31.3	21.4	17.0	4.5	211.9
1.90	203.7	145.6	99.1	79.5	61.5	52.1	30.9	20.4	16.3	4.8	198.4
2.00	190.7	139.1	94.6	75.9	58.8	50.0	30.4	19.5	15.7	5.1	186.3
2.25	164.4	124.5	85.1	68.3	53.0	45.4	28.9	18.1	14.2	5.4	160.8
2.50	143.7	112.1	77.3	62.1	48.2	41.4	27.2	17.9	12.9	5.5	140.7
2.75	127.0	101.5	70.9	56.9	38.1	38.1	25.6	17.5	11.8	5.4	124.5
3.00	113.4	92.4	65.6	52.6	35.2	35.2	24.0	17.0	11.2	5.2	112.5
4.00	78.8	67.3	50.6	40.6	27.2	27.2	29.0	14.3	10.4	4.3	78.3
5.00	59.1	64.6	41.4	33.2	22.2	22.2	15.6	12.0	9.3	3.5	58.8
6.00	56.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7	46.7
7.00	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4	40.4
8.00	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8	35.8
9.00	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2	32.2
10.00	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.4
15.00	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5
20.00	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9	15.9

FOOTNOTE: * Based on a 1 Gram/Second Emission Rate

(B) Determine annual/hourly ratio for rural analysis. The maximum average annual dispersion coefficient is approximated by multiplying the maximum hourly dispersion coefficient (identified in Step 7(A)) by the appropriate ratio selection from Table 5.0-6. The generic source number(s) [from Steps 5(C) or 5(E)], urban/rural designation (from Step 6), and the terrain type are used to select the appropriate scaling factor. Use the noncomplex terrain designation for all sources located in flat terrain, for all sources where the physical stack height of the worst-case stack is less than or equal to 10 m, for all sources where the worst-case stack is less than the minimum GEP, and for those sources where all of the TAESH values in Step 5(E) are greater than zero. Use the complex terrain designation in all other situations.

(C) Determine maximum average annual dispersion coefficient. The maximum average annual dispersion coefficient is determined by multiplying the maximum hourly dispersion coefficient (Step 7(A)) by its corresponding annual/hourly ratio (Step 7(B)).

Terrain	Distance from stack (m)	Generic source No.	Maximum hourly dispersion coefficient ($\mu\text{g}/\text{m}^3/\text{g}/\text{sec}$)	Annual hourly ratio	Maximum annual dispersion coefficient ($\mu\text{g}/\text{m}^3/\text{g}/\text{sec}$) ¹
Flat	0-20.0				
	0-0.5				

	>0.5-2.5
Rolling or	>2.5-5.0
Complex	>5.0-20.0

FOOTNOTE: ¹ Maximum hourly dispersion coefficient times annual/hourly ratio.

- Step 8: Estimate Maximum Ambient Air Concentrations—see procedures prescribed in subpart H of 40 CFR part 266.
- Step 9: Determine Compliance with Regulatory Limits—see procedures prescribed in subpart H of 40 CFR part 266.
- Step 10: Multiple Stack Method (Optional)

This option is a special case procedure that may be helpful when (1) the facility exceeded the regulatory limits for one or more pollutants, as detailed in Step 9, and (2) the facility has multiple stacks with substantially different emission rates and effective release heights. Only those pollutants that fail the Step 9 screening limits need to be addressed in this exercise.

This procedure assesses the environmental impacts from each stack and then sums the results to estimate total impacts. This option is conceptually the same as the basic approach (Steps 1 through 9) and does not involve complex calculations. However, it is more time-consuming and is recommended only if the basic approach fails to meet the risk criteria. The procedure is outlined below.

(A) Compute effective stack heights for each stack.⁸

FOOTNOTE: ⁸ Follow the procedure outlined in Step 4 of the basic screening procedure to determine the GEP for each stack. If a stack's physical height exceeds the maximum GEP, use the maximum GEP values. If a stack's physical height is less than the minimum GEP, use generic source number 11 in the subsequent steps of this analysis. Follow the procedure in Steps 5(A) and 5(B) to determine the effective height of each stack.

Stack No.	GEP stack height (m)	Flow rate (m/sec)	Exit temp (°K)	Plume rise (m)	Effective stack height (m)
1	_____	_____	_____	_____	_____
2	_____	_____	_____	_____	_____
3	_____	_____	_____	_____	_____

Add an additional page if more than three stacks are involved. Circle the maximum and minimum effective stack heights.

(B) Determine if this multiple-stack screening procedure will likely produce less conservative results than the procedure in Steps 1 through 9. To do this, compute the ratio of maximum-to-minimum effective stack height:

$$\frac{\text{Maximum Effective Stack Height}}{\text{Minimum Effective Stack Height}} = \underline{\hspace{2cm}}$$

If the above ratio is greater than 1.25, proceed with the remaining steps. Otherwise, this option is less likely to significantly reduce the degree of conservatism in the screening method.

(C) Determine if terrain adjustment is needed and select generic source numbers. Select the shortest stack height and maximum terrain rise out to 5 km from Step 1 and determine if the facility is in flat terrain.

Shortest stack height (m) = _____

Maximum terrain rise in meters out to 5 km = _____

$$\frac{\text{Terrain Rise (m)}}{\text{Shortest Stack Height (m)}} \times 100 = \underline{\hspace{2cm}} \%$$

If the value above is greater than 10 percent, the terrain is considered nonflat; proceed to Step 10(D). If the ratio is less than or equal to 10 percent, the terrain is considered flat. Identify the generic source numbers based on effective stack heights computed in Step 10(A). Refer to Table 5.0-2 provided earlier to identify generic source numbers. Record the generic source numbers identified and proceed to Step 10(F).

	Stack No.		
	1	2	3
Generic Source Numbers	_____	_____	_____

(D) Compute the TAESH and select generic source numbers (four sources located in nonflat terrain).

1. Compute the TAESH for all remaining stacks using the following equation:

$$HE - TR = \text{TAESH}$$

where:

HE=effective stack height (m)

TR=maximum terrain rise for each distance range (m)

TAESH = terrain-adjusted effective stack height (m)

Use the Table Below To Calculate the TAESH for Each Stack⁹

Distance Range (km)	Stack No.		
	0-0.5	>0.5-2.5	>2.5-5.0
	HE - TR = TAESH	HE - TR = TAESH	HE - TR = TAESH
1 - = - = - =
2 - = - = - =
3 - = - = - =

For those stacks where the terrain rise within a distance range is greater than the effective stack height (i.e., HE-TR is less than zero), the TAESH for that distance range is set equal to zero, and generic source number 1 should be used for that distance range for all subsequent distance ranges. Additionally, for all stacks with a physical stack height of less than or equal to 10 meters, use generic source number 1 for all distance ranges.¹⁰ For the remaining stacks, proceed to Step 10(D)(2).

2. For the remaining stacks, refer to Table 5.0-2 and, for each distance range, identify the generic source number that includes the TAESH. Use the values obtained from Steps 10(D)(1) and 10(D)(2) to complete the following summary worksheet;

FOOTNOTE: ⁹ Refer to Step 1 for terrain adjustment data. Note that the distance from the source to the outer radii of each range is used. For example, for the range >0.5-2.5 km, the maximum terrain rise in the range 0.0-2.5 km is used.

FOOTNOTE: ¹⁰ This applies to all stacks less than or equal to 10 meters regardless of the terrain classification.

GENERIC SOURCE NUMBER AFTER TERRAIN ADJUSTED (IF NECESSARY)

Stack No.	0-0.5 km	>0.5-2.5 km	>2.5-5.0 km
1			
2			
3			

(E) Identify maximum average hourly dispersion coefficients. Based on the land use classification of the site (e.g., urban or rural), use either Table 5.0-4 or Table 5.0-5 to determine the appropriate dispersion coefficient for each distance range for each stack. Begin at the minimum fence line distance indicated in Step 7(B) and record on Worksheet 5.0-1 the dispersion coefficient for each stack/distance range. For stacks located in facilities in flat terrain, the generic source numbers were computed in Step 10(C). For stacks located in facilities in rolling and complex terrain, the generic source numbers were computed in Step 10(D). For flat terrain applications and for stacks with a physical height of less than or equal to 10 meters, only one generic source number is used per stack for all distance ranges. For other situations up to three generic source numbers may be needed per stack (i.e., a unique generic source number per distance range). In Tables 5.0-4 and 5.0-5, the dispersion coefficients for distances of 6 km to 20 km are the same for all generic source numbers in order to conservatively represent terrain beyond 5 km (past the limits of the terrain analysis).

Worksheet 5.0-1 Dispersion Coefficient by Downwind Distance ¹

Distance	Stack 1	Stack 2	Stack 3
0.20			
0.25			
0.30			
0.35			
0.40			
0.45			
0.50			
0.55			
0.60			
0.65			
0.70			
0.75			
0.80			
0.85			
0.90			
0.95			
1.00			
1.10			
1.20			
1.30			
1.40			
1.50			
1.60			
1.70			
1.80			

Distance	Stack 1	Stack 2	Stack 3
1.90			
2.00			
2.25			
2.50			
2.75			
3.00			
4.00			
5.00			
6.00			
7.00			
8.00			
9.00			
10.00			
15.00			
20.00			

¹Note: This procedure places all stacks at the same point, but allows for consideration of different effective stack heights. The distance to the closest boundary (extracted from Step 1) should be the closest distance to any stack.

(F) Estimate maximum hourly ambient air concentrations. In this step, pollutant-specific emission rates are multiplied by appropriate dispersion coefficients to estimate ambient air concentrations. For each stack, emissions are multiplied by the dispersion coefficient selected in Step 10(E) and summed across all stacks to estimate ambient air concentrations at venous distances from the facility. From these summed concentrations, the maximum hourly ambient air concentration is selected. First, select the maximum emission rate of the pollutant.¹¹ Record these data in the spaces provided below.¹²

Maximum Annual Emission Rates (g/sec)

Pollutant	Stack 1	Stack 2	Stack 3

FOOTNOTE: ¹¹ Recall that it is recommended that this analysis be performed for only one or two pollutants. The pollutants chosen for this analysis should be those that show the most significant exceedances of the risk threshold.

FOOTNOTE: ¹² Refer to Step 8 of the basic screening procedure. At this point in the screening procedure, annual emissions are used to represent hourly average emission rates. These values will be adjusted by the annual/hourly ratio to estimate annual average concentrations.

Complete a separate copy of Worksheet 5.0-2 for each pollutant and select the highest hourly concentration from the summation column at the far right of the worksheet. Record the maximum hourly air concentration for each pollutant analyzed (add additional lines if needed):

Pollutant	Maximum hourly air concentration

WORKSHEET 5.0-2 MAXIMUM HOURLY AMBIENT AIR CONCENTRATION

Pollutant

ER = Annual Average Emission Rate; DC = Hourly Dispersion Coefficient (from Worksheet 5.0-1); C = Estimated Maximum Hourly Ambient Air Concentration

Total Distance (km)	Stack 1 ER x DC = C	Stack 2 ER x DC = C	Stack 3 ER x DC = C	Summed Concentration from all Stacks
0.20	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.25	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.30	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.35	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.40	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.45	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.50	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.55	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.60	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.65	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.70	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.75	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.80	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.85	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.90	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
0.95	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
1.00	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____
1.10	___ x ___ = ___	___ x ___ = ___	___ x ___ = ___	_____

Total Distance (km)	Stack 1 ER x DC = C	Stack 2 ER x DC = C	Stack 3 ER x DC = C	Summed Concentration from all Stacks
1.20	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.30	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.40	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.50	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.60	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.70	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.80	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
1.90	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
2.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
2.25	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
2.50	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
2.75	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
3.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
4.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
5.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
6.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
7.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
8.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
9.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
10.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
15.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____
20.00	___ x ___ = _____	___ x ___ = _____	___ x ___ = _____	_____

ER = Annual Average Emission Rate DC = Hourly Dispersion Coefficient (from Worksheet 5.0-1) C = Estimated Maximum Hourly Ambient Air Concentration

(G) Determine the complex/noncomplex designation for each stack. For each stack, subtract the maximum terrain rise within 5 km of the site from the physical stack height and designate the stack as either complex or noncomplex. If the stack height minus the maximum terrain rise (within 5 km) is greater than zero or if the stack is less than 10 meters in physical height, then assign the stack a noncomplex designation. If the stack height minus the maximum terrain rise (within 5 km) is less than or equal to zero, then assign the stack a complex designation.

Perform the following computation for each stack and record the information in the spaces provided. Check in the spaces provided whether the stack designation is complex or noncomplex.

Stack No.	Stack height (m)	-	Maximum terrain rise (m)	=	Complex	Noncomplex
1		-		= (m)		
2		-		= (m)		
3		-		= (m)		

(H) Identify annual/hourly ratios. Extract the annual/hourly ratios for each stack by referring to Table 5.0-6. Generic source numbers (from Steps 10(C) or 10(D), urban/rural designation (from Step 6)), and complex or noncomplex terrain designations (from Step 10(G)) are used to select the appropriate scaling factor needed to convert hourly maximum concentrations to estimates of annual average concentrations.

Complete the following table: 13

Stack No.	Generic source No. steps 10 (C or D) Distance ranges (km)			Annual/hourly ratio (from table 5.0-6) Distance ranges (km)		
	0-0.5	>0.5-2.5	>2.5-5.0	0-0.5	>0.5-2.5	>2.5-5.0
1
2
3

FOOTNOTE: 13 If any stack (excluding generic stack number 1 and 11) in Step 10(D) shows a negative terrain adjusted stack height, use the complex terrain annual/hourly ratios.

(I) Select the highest annual/hourly ratio among all of the stacks,¹⁴ and then estimate the maximum annual average ambient air concentrations for each pollutant by completing the following table, where:

- C = Maximum total hourly ambient air concentration ($\mu\text{g}/\text{m}^3$) for pollutant "N" from Step 10(F).
- C_n = Maximum annual average air concentration for pollutant "N" ($\mu\text{g}/\text{m}^3$).
- R = Annual/hourly ratio.

FOOTNOTE: 14 As an option, the user can identify the stack with the highest ratio for each distance range (rather than the absolute highest). In this case, extra sheets would be needed to show estimated annual average concentrations from each stack by multiplying emission rate times maximum hourly dispersion coefficient times maximum annual/hourly ratio for applicable distance range. Then sum across all stacks for each downwind distance.

Table 5.0-6.-95th Percentile of Annual/Hourly Ratios

Noncomplex Terrain			Complex Terrain		
Source	Urban	Rural	Source	Urban	Rural
1	0.019	0.014	1	0.020	0.053
2	0.033	0.019	2	0.020	0.053
3	0.031	0.018	3	0.030	0.057
4	0.029	0.017	4	0.051	0.047
5	0.028	0.017	5	0.067	0.039
6	0.028	0.017	6	0.059	0.034
7	0.031	0.015	7	0.036	0.031
8	0.030	0.013	8	0.026	0.024
9	0.0289	0.011	9	0.026	0.024
10	0.029	0.008	10	0.017	0.013
11	0.018	0.015	11	0.020	0.053

Pollutant	$C_n(\mu\text{g}/\text{m}^3) \times R = C_n(\mu\text{g}/\text{m}^3)$
..... × =
..... × =

(J) Use the maximum annual average concentrations from Step 10(I) to determine compliance with regulatory requirements.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Editor's Note

Republished in 2016 to fix a typographical error.

Section 6.0. SIMPLIFIED LAND USE CLASSIFICATION PROCEDURE FOR COMPLIANCE WITH TIER I AND TIER II LIMITS

6.1 Introduction

This section provides a simplified procedure to classify areas in the vicinity of boilers and industrial furnace sites as urban or rural in order to set risk-based emission limits under subpart H of 40 CFR part 266. Urban/rural classification is needed because dispersion rates differ between urban and rural areas and thus, the risk per unit emission rate differs accordingly. The combination of greater surface roughness (more buildings/structures to generate turbulent mixing) and the greater amount of heat released from the surface in an urban area (generates buoyancy-induced mixing) produces greater rates of dispersion. The emission limit tables in the regulation, therefore, distinguish between urban and rural areas.

EPA guidance (EPA 1986) provides two alternative procedures to determine whether the character of an area is predominantly urban or rural. One procedure is based on land use typing and the other is based on population density. Both procedures require consideration of characteristics within a 3-km radius from a source, in this case the facility stack(s). The land use typing method is preferred because it more directly relates to the surface characteristics that affect dispersion rates. The remainder of this discussion is, therefore, focused on the land use method.

While the land use method is more direct, it can also be labor-intensive to apply. For this discussion, the land use method has been simplified so that it is consistent with EPA guidance (EPA 1986; Auer 3978), while streamlining the process for the majority of applications so that a clear-cut decision can be made without the need for detailed analysis. Table 6.0-1 summarizes the simplified approach for classifying areas as urban or rural. As shown, the applicant always has the option of applying standard (i.e., more detailed) analyses to more accurately distinguish between urban and rural areas. However, the procedure presented here allows for simplified determinations, where appropriate, to expedite the permitting process.

Table 6.0-1.-Classification of Land Use Types

Type ¹	Description	Urban or rural designation ²
I1	Heavy Industrial	Urban.
I2	Light/Moderate Industrial	Urban.
C1	Commercial	Urban.
R1	Common Residential (Normal Easements)	Rural.
R2	Compact Residential (Single Family)	Urban.
R3	Compact Residential (Multi-Family)	Urban.
R4	Estate Residential (Multi-Acre Plots)	Rural.
A1	Metropolitan Natural	Rural.
A2	Agricultural	Rural.
A3	Undeveloped (Grasses/Weeds)	Rural.
A4	Undeveloped (Heavily Wooded)	Rural.
A5	Water Surfaces	Rural.

FOOTNOTE: ¹ EPA, Guideline on Air Quality Models (Revised), EPA-450/2-78-027, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July, 1985.

FOOTNOTE: ² Auer, August H. Jr., "Correlation of Land Use and Cover with Meteorological Anomalies." Journal of Applied Meteorology, pp. 636-643, 1978.

6.2 Simplified Land Use Process

The land use approach considers four primary land use types: industrial (I), commercial (C), residential (R), and agricultural (A). Within These primary classes, subclasses are identified, as shown in table 6.0-1. The goal is to estimate the percentage of the area within a 3-km radius that is urban type and the percentage that is rural type. Industrial and commercial areas are classified as urban; agricultural areas are classified as rural.





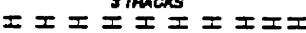

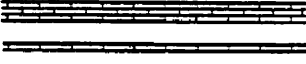







The delineation of urban and rural areas, however, can be more difficult for the residential type areas shown in table 6.0-1. The degree of resolution shown in table 6.0-1 for residential areas often cannot be identified without conducting site area inspections and/or referring to zoning maps. This process can require extensive analysis, which, for many applications, can be greatly streamlined without sacrificing confidence in selecting the appropriate urban or rural classification.

The fundamental simplifying assumption is based on the premise that many applications will have clear-cut urban/rural designations, i.e., most will be in rural settings that can be definitively characterized through a brief review of topographical maps. The color coding on USGS topographical maps provides the most effective means of simplifying the typing scheme. The suggested typing designations for the color codes found on topographical maps are as follows:

Green Wooded areas (rural).

White White areas generally will be treated as rural. This code applies to areas that are unwooded and do not have densely packed structures which would require the pink code (house omission tint). Parks, industrial areas, and unforrested rural land will appear as white on the topographical maps. Of these categories, only the industrial areas could potentially be classified as urban based on EPA 1986 or Auer 1978. Industrial areas can be easily identified in most cases by the characteristics shown in Figure 6.0-1. For this simplified procedure, white areas that have an industrial classification will be treated as urban areas.

Figure 6.0-1
Supplementary Publication Symbols

<p>117 Single track <i>Line weight .005", Tie weight .003", length .64", spaced .20" center to center.</i></p>	
<p>118 Single track abandoned <i>Same as existing track with space .02", dash .16". Label.</i></p>	
<p>119 Single track under construction <i>Same as existing track with space .02", dash .36". Label UNDER CONSTRUCTION.</i></p>	
<p>120 Multiple main line track <i>Overall width .817". Line weight .003". Tie length .052", spaced .20" center to center. If more than two tracks label, with double cross as at point of change. Double cross to be .017" overall width.</i></p>	
<p>121 Multiple track abandoned <i>Same as existing track with space .02", dash .16". Label ABANDONED.</i></p>	
<p>122 Multiple track under construction <i>Same as existing track with space .02", dash .36". Label UNDER CONSTRUCTION.</i></p>	
<p>123 Juxtaposition <i>Alternate ties, spaced .20" center to center. Minimum space between tracks .011". Line weight for single tracks .006", multiple tracks .003".</i></p>	
<p>124 Railroad in street <i>Ties spaced .20" center to center. Label if narrow gage. Tie weight .003".</i></p>	
<p>125 Yards <i>Line weight .003". Space between tracks .011". Ties spaced .20" center to center, maximum length to touch 8 tracks.</i></p>	
<p>126 Sidings <i>Line weight .003". Scribe to scale with minimum space between tracks .011". Ties spaced .20" center to center, length .64" for single track.</i></p>	
<p>176 Large buildings <i>Outline weight .003". When width exceeds .06", hatch at 45° angle to building in NE direction. Lines .002" spaced .02" center to center.</i></p>	
<p>178 Sewage disposal or filtration plant <i>Line weight .003". See symbol 700 for blue hatching. Label.</i></p>	
<p>196 Tanks: oil, gas, water, etc. <i>Circle .03" minimum, 10" maximum. Label as to content.</i></p>	
<p>197 Tanks: oil, gas, water, etc. <i>Exceeding 10" diameter. Outline weight .003". Hatch SW-NE with .002" lines spaced .02" center to center. Label as to content.</i></p>	

[Appendix IX]

Section 7.0. STATISTICAL METHODOLOGY FOR BEVILL RESIDUE DETERMINATIONS

This section describes the statistical comparison of waste-derived residue to normal residue for use in determining eligibility for the Bevill exemption under 40 CFR 266.112.

7.1 Comparison of Waste-derived Residue with Normal Residue

To meet the special criteria under 266.112(b)(1), waste-derived residue must not contain appendix VIII, Part 261, constituents (toxic constituents) at concentrations significantly higher than in residue generated without burning or processing hazardous waste. Concentrations of toxic constituents in normal residue are determined based on analysis of a minimum of 10 composite samples. (Note that "normal" residue refers to residue generated by a facility when operating without burning hazardous waste.) The 95th percent confidence interval about the mean of the normal residue concentrations must be used in the comparison of waste-derived residue with normal residue; the confidence interval is determined as described in section 7.2 below. The concentration of a toxic constituent in the waste-derived residue is not considered to be significantly higher than in the normal residue if the concentration in the waste-derived residue does not exceed the upper 95th percent confidence interval about the mean that was established for the normal residue. Concentrations of toxic constituents in waste-derived residue are determined based on analysis of samples taken over a compositing period of not more than 24 hours.

7.2 Calculation of the 95th Percent Confidence Interval About the Mean for Toxic Constituents in Normal Residue

The 95th percent confidence interval about the mean is calculated for a set of values using a "t" distribution. In use of the "t" distribution, it is assumed that the values are normally distributed; the "t" distribution is applicable for use with small sample sets (i.e. approximately 10-30 samples). The 95th percent confidence interval about the mean is determined using the following equation:

95th percent confidence interval = $\bar{X} \pm t_{\alpha} (s/\sqrt{n})$
 where \bar{X} = mean of the normal residue concentrations,

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

α = the level of significance = 0.05,
 s = standard deviation of the normal residue concentrations,

$$s = \sqrt{\frac{\sum_{i=1}^n [(X_i - \bar{X})^2]}{(n-1)}}$$

and

n = sample size.

The values of the "t" distribution at the $\alpha/2$ level of significance and $n - 1$ degrees of freedom are given in table 7.0-1.

For example, a normal residue test results in 10 samples with the following analysis results for toxic compound A:

Sample No.	Concentration of compound A (ppm)
1	10
2	10
3	15
4	10
5	7
6	12
7	10
8	16
9	15
10	10

The mean and standard deviation of these measurements, calculated using equations above, are 11.5 and 2.9 respectively. Assuming that the values are normally distributed, the upper 95th percent confidence interval value about the mean is given by:

Table 7.0-1.-T Distribution Values

Degrees of freedom (n-1)	Percentage point of t distribution ($\alpha/2=0.025$)
1	12.706
2	4.303
3	3.182
4	2.776
5	2.571
6	2.447
7	2.365
8	2.306
9	2.262
10	2.228
11	2.201
12	2.179

Degrees of freedom (n-1)	Percentage point of t distribution ($\alpha/2=0.025$)
13	2.160
14	2.145
15	2.131
16	2.120
17	2.110
18	2.101
19	2.093
20	2.086
21	2.080
22	2.074
23	2.069
24	2.064
25	2.060
26	2.056
27	2.052
28	2.048
29	2.045

95th percent confidence interval value= $11.5 + 2.262 \times (2.9/\sqrt{10})=13.6$ ppm.

Thus, if the concentration of compound A in the waste-derived residue is below 13.6 ppm, then the waste-derived residue is eligible for the Bevill exemption for toxic compound A.

7.3 Normal Distribution Assumption

As noted in section 7.2 above, this statistical approach (use of the 95th percent confidence interval about the mean) for calculation of the concentration in normal residue is based on the assumption that the concentration data are distributed normally. The Department is aware that concentration data of this type may not be distributed normally, particularly when concentrations are near the detection limits. There are a number of procedures that can be used to test the distribution of a data set. For example, the Shapiro-Wilk test, examination of a histogram or plot of the data on normal probability paper, and examination of the coefficient of skewness are methods that may be applicable, depending on the nature of the data (Reference 1 and 2).

If the concentration data are not adequately represented by a normal distribution, the data may be transformed to attain a near normal distribution. The Department has found that concentration data, especially when near detection levels, often exhibit a lognormal distribution. The assumption of a lognormal distribution has been used in various programs at EPA, such as in the Office of Solid Waste Land Disposal Restrictions program for determination of BDAT treatment standards. The transformed data may be tested for normality using the procedures identified above. If the transformed data are better represented by a normal distribution than the untransformed data, the transformed data should be used in determining the 95th percent confidence interval using the procedures in section 7.2 above.

In all cases where the applicant for the Bevill exemption wishes to use other than an assumption of normally distributed data, or believes that use of an alternate statistical approach is appropriate to the specific data set, the applicant must provide supporting rationale and demonstrate to the Department or permitting authority that the data treatment is based upon sound statistical practice.

7.4 Nondetect Values

The Department is developing guidance regarding the treatment of nondetect values (data where the concentration of the constituent being measured is below the lowest concentration for which the analytical method is valid) in carrying out the statistical determinations described above. Until the guidance information is available, facilities may present their own approach to the handling of nondetect data points, but must provide supporting rationale in the operating record for consideration by the Department or permitting authority.

7.5 References

1. Shapiro, S.S. and Wilk, M.B. (1965), "An Analysis of Variance Test for Normality (complete samples)," *Biometrika*, 591-611.

2. Bhattacharyya, G.K. and R.A. Johnson (1977), *Statistical Concepts and Methods*, John Wiley and Sons, New York.

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Section 8.0. PROCEDURES FOR DETERMINING DEFAULT VALUES FOR AIR POLLUTION CONTROL SYSTEM REMOVAL EFFICIENCIES

During interim status, owners or operators of boilers and industrial furnaces burning hazardous waste must submit documentation to the Department that certifies that emissions of HCl, Cl₂, metals, and particulate matter (PM) are not likely to exceed allowable emission rates. See certification of precompliance under 266.103(b). This documentation also establishes interim status feed rate and operating limits for the facility. For the initial certification, estimates of emissions and system removal efficiencies (SREs) can be made to establish the operating limits. Subsequently, owners or operators must use emissions testing to demonstrate that emissions do not exceed allowable levels, and to establish operating limits. See 40 CFR 266.103(c). However, initial estimates of emissions for certification of precompliance can be based on estimated or established SREs.

The SRE combines the effect of partitioning of the chlorine, metals, or PM and the air pollution control system removal efficiency (APCS RE) for these pollutants. The SRE is defined as:

$$\text{SRE} = (\text{species input} - \text{species emitted}) / \text{species input}$$

The SRE can be calculated from the partitioning factor (PF) and APCS RE by the following formula:

$$\text{SRE} = 1 - [(\text{PF}/100) \times (1 - \text{APCS RE}/100)]$$

where:

PF = percentage of the pollutant partitioned to the combustion gas

Estimates of the PF and/or the APCS RE can be based on either EPA's default values or engineering judgement. EPA's default values for the APCS RE for metals, HCl, Cl₂, and PM are described in this section. EPA's default values for partitioning of these pollutants are described in section 9.0.

Guidelines for the use of engineering judgement to estimate APCS REs or PFs are described in section 9.4.

8.1 APCS RE Default Values for Metals

EPA's default assumptions for APCS RE for metals are shown in Table 8.1-1. The default values in the table are conservative estimates of the removal efficiencies for metals in BIFs, depending on the volatility of the metal and the type of APCS.

The volatility of a metal depends on the temperature, the thermal input, the chlorine content of the waste, and the identity and concentration of the metal. Metals that do not vaporize at combustion zone temperatures are classified as "nonvolatile". Such metals typically enter the APCS in the form of large particles that are removed relatively easily. Metals that vaporize in the combustion zone and condense before entering the APCS are classified as "volatile". Such metals typically enter the APCS in the form of very fine, submicron particles that are rather inefficiently removed in many APCSs. Metals that vaporize in the combustion zone and do not condense before entering the APCS are classified as "very volatile". Such metals enter the APCS in the form of a vapor that is very inefficiently removed in many APCSs.

Typically, BIFs have combustion zone temperatures high enough to vaporize any hazardous metal at concentrations sufficient to exceed risk-based emission limits. For this reason, the default assumption is that there are no nonvolatile metals. Tables 8.1-2 and 8.1-3 are used to determine whether metals are classified as "volatile" or "very volatile" depending on the temperature entering the APCS, the thermal input, and whether the waste is chlorinated or nonchlorinated.

Table 8.1-1.-Air Pollution Control Systems (APCS) and Their Conservatively Estimated Efficiencies for Controlling Toxic Metals (%)

APCS	Metal Volatility		
	Nonvolatile	Volatile	Very Volatile
WS	40	30	20
VS-20	80	75	20
VS-60	87	75	40
ESP-1	90	75	0
ESP-2	92	80	0
ESP-4	95	80	0
WESP	90	85	40
FF	90	80	0
SD/FF	97	90	0
DS/FF	95	90	0
IWS	90	87	75

WS = Wet Scrubber including: Sieve Tray Tower, Packed Tower, Bubble Cap Tower
 VS-20 = Venturi Scrubber, ca. 20-30 in W.G. Δp
 VS-60 = Venturi Scrubber, ca. > 60 in W.G. Δp
 ESP-1 = Electrostatic Precipitator; 1 stage
 ESP-2 = Electrostatic Precipitator; 2 stage
 ESP-4 = Electrostatic Precipitator; 4 stage
 IWS = Ionizing Wet Scrubber
 DS = Dry Scrubber
 FF = Fabric Filter (Baghouse)
 SD = Spray Dryer (Wet/Dry Scrubber)
 WESP = Wet Electrostatic Precipitator

Table 8.1-2. Temperature (F) Entering APCS Above Which Metals Are Classified as Very Volatile in Combustion of Nonchlorinated Wastes

Metal		Thermal Input (MMBtu/hr) ¹				
Name	Symbol	1	10	100	1000	10000
Arsenic	As	320	280	240	200	160
Cadmium	Cd	1040	940	860	780	720
Chromium	Cr	2000	1760	1580	1420	1380
Beryllium	Be	1680	1440	1240	1080	980
Antimony	Sb	680	600	540	480	420
Barium	Ba	2240	1820	1540	1360	1240
Lead	Pb	1280	1180	1080	1000	920
Mercury	Hg	340	300	260	220	180
Silver	Ag	1820	1640	1480	1340	1220
Thallium	Tl	900	800	700	620	540

FOOTNOTE: ¹ Interpolation of thermal input is not allowed. If a BIF fires between two ranges, the APCS temperature under the higher thermal input must be used.

Example: For a BIF firing 10-100 MMBtu/hr, Mercury is considered very volatile at APCS temperatures above 260 F and volatile at APCS temperatures of 260 F and below.

Table 8.1-3. Temperature (F) Entering APCS Above Which Metals Are Classified as Very Volatile in Combustion of Chlorinated Wastes

Metal		Thermal Input (MMBtu/hr) ¹				
Name	Symbol	1	10	100	1000	10000
Arsenic	As	320	280	240	200	160
Cadmium	Cd	1040	940	860	780	720
Chromium	Cr	>140	>140	>140	>140	>140

Metal		Thermal Input (MMBtu/hr) ¹				
Name	Symbol	1	10	100	1000	10000
Beryllium	Be	1680	1440	1240	1080	980
Antimony	Sb	680	600	540	480	420
Barium	Ba	2060	1840	1680	1540	1420
Lead	Pb	>140	>140	>140	>140	>140
Mercury	Hg	340	300	260	220	180
Silver	Ag	1080	940	840	740	660
Thallium	Tl	900	800	700	620	540

FOOTNOTE: ¹ Interpolation of thermal input is not allowed. If a BIF fires between two ranges, the APCS temperature under the higher thermal input must be used.

Example: For a BIF firing 10–100 MMBtu/hr, Mercury is considered very volatile at APCS temperatures above 260 F and volatile at APCS temperatures of 260 F and below.

A waste is considered chlorinated if chlorine is present in concentrations greater than 0.1 percent by weight. In the EPA guidance document “Guidance for Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators, Volume IV of the Hazardous Waste Incineration Guidance Series,”(1) one percent is used for the chlorinated/nonchlorinated cutoff. However, best engineering judgement, based on examination of pilot-scale data reported by Carroll et al. (2) on the effects of waste chlorine content on metals emissions, suggests that the 1 percent cutoff may not be sufficiently conservative.

Tables 8.1-2 and 8.1-3 were compiled based on equilibrium calculations. Metals are classified as very volatile at all temperatures above the temperature at which the vapor pressure of the metal is greater than 10 percent of the vapor pressure that results in emissions exceeding the most conservative risk-based emissions limits.

8.2 APCS RE Default Values for HCl and Cl₂

Default assumptions for APCS RE for HCl in BIFs are shown in Table 8.2-1. This table is identical to the column for other BIFs except that cement kilns have a minimum HCl removal efficiency of 83 percent. Because of the alkaline nature of the raw materials in cement kilns, most of the chlorine is converted to chloride salts. Thus, the minimum APCS RE for HCl for cement kilns is independent of the APCS train.

Removal efficiency of Cl₂ for most types of APCS is generally minimal. Therefore, the default assumption for APCS RE for Cl₂ for all APCSs is 0 percent. This is applicable to all BIFs, including cement kilns.

8.3 APCS RE Default Values for Ash

Default assumptions for APCS RE for PM are also shown in Table 8.1-4. These figures are conservative estimates of PM removal efficiencies for different types of APCSs. They are identical to the figures in the Nonvolatile APCS RE column for hazardous metals presented in Table 8.1-1 because the same collection mechanisms and collection efficiencies that apply to nonvolatile metals also apply to PM.

Table 8.2-1.-Air Pollution Control Systems (APCS) and Their Conservatively Estimated Efficiencies for Removing Hydrogen Chloride and Particulate Matter (PM) (%)

APCD	HCl		
	Cement kilns	Other BIFs	PM
WS	97	97	40
VS-20	97	97	80
VS-60	98	88	87
ESP-1	83	0	90
ESP-2	83	0	92
ESP-4	83	0	95
WESP	83	70	90
FF	83	0	90

APCD	HCl		
	Cement kilns	Other BIFs	PM
SD/FF	98	98	97
DS/FF	98	98	95
WS/IWS	99	99	95
IWS	99	99	90

- WS= Wet Scrubber including: Sieve Tray Tower, Packed Tower, Bubble Cap Tower
PS= Proprietary Wet Scrubber Design (A number of proprietary wet scrubbers have come on the market in recent years that are highly efficient on both particulates and corrosive gases. Two such units are offered by Calvert Environmental Equipment Co. and by Hydro-Sonic Systems, Inc.).
VS-20= Venturi Scrubber, ca. 20-30 in W.G. ▲p
VS-60= Venturi Scrubber, ca. >60 in W.G. ▲p
ESP-1= Electrostatic Precipitator: 1 stage
ESP-2= Electrostatic Precipitator: 2 stage
ESP-4= Electrostatic Precipitator: 4 stage
IWS= Ionizing Wet Scrubber
DS= Dry Scrubber
FF= Fabric Filter (Baghouse)
SD= Spray Dryer (Wet/Dry Scrubber)

8.4 References

1. U.S. Environmental Protection Agency. "Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators," Office of Solid Waste, Washington, D.C., August 1989.
2. Carroll, G.J., R.C. Thurnau, R.E. Murnighan, L.R. Waterland, J.W. Lee, and D.J. Fournier. The Partitioning of Metals in Rotary Kiln Incineration. Proceedings of the Third International Conference on New Frontiers for Hazardous Waste Management. NTIS Document No. EPA/600/9-89/072, p. 555 (1989).

Section 9.0. PROCEDURES FOR DETERMINING DEFAULT VALUES FOR PARTITIONING OF METALS, ASH, AND TOTAL CHLORIDE/CHLORINE

Pollutant partitioning factor estimates can come from two sources: default assumptions or engineering judgement. EPA's default assumptions are discussed below for metals, HCl, Cl₂, and PM. The default assumptions are used to conservatively predict the partitioning factor for several types of BIFs. Engineering judgement-based partitioning factor estimates are discussed in section 9.4.

9.1 Partitioning Default Value for Metals

To be conservative, the Department is assuming that 100 percent of each metal in each feed stream is partitioned to the combustion gas. Owners/operators may use this default value or a supportable, site-specific value developed following the general guidelines provided in section 9.4.

9.2 Special Procedures for Chlorine, HCl, and Cl₂

The Department has established the special procedures presented below for chlorine because the emission limits are based on the pollutants HCl and Cl₂ formed from chlorine fed to the combustor. Therefore, the owner/operator must estimate the controlled emission rate of both HCl and Cl₂ and show that they do not exceed allowable levels.

1. The default partitioning value for the fraction of chlorine in the total feed streams that is partitioned to combustion gas is 100 percent. Owners/operators may use this default value or a supportable, site-specific value developed following the general guidelines provided in section 9.4.

2. To determine the partitioning of chlorine in the combustion gas to HCl versus Cl₂, either use the default values below or use supportable site-specific values developed following the general guidelines provided in section 9.4.

- For BIFs excluding halogen acid furnaces (HAFs), with a total feed stream chlorine/hydrogen ratio ≥ 0.95 , the default partitioning factor is 20 percent Cl₂, 80 percent HCl.

- For HAFs and for BIFs with a total feed stream chlorine/hydrogen ratio ≥ 0.95 , the default partitioning factor is 100 percent Cl₂.

3. To determine the uncontrolled (i.e., prior to acid gas APCS) emission rate of HCl and Cl₂, multiply the feed rate of chlorine times the partitioning factor for each pollutant. Then, for HCl, convert the chlorine emission rate to HCl by multiplying it by the ratio of the molecular weight of HCl to the molecular weight of Cl (i.e., 36.5/35.5). No conversion is needed for Cl₂.

9.3 Special Procedures for Ash

This section: (1) Explains why ash feed rate limits are not applicable to cement and light-weight aggregate kilns; (2) presents the default partitioning values for ash; and (3) explains how to convert the 0.08 gr/dscf, corrected to 7% O₂, PM emission limit to a PM emission rate.

Waiver for Cement and Light-Weight Aggregate Kilns. For cement kilns and light-weight aggregate kilns, raw material feed streams contain the vast majority of the ash input, and a significant amount of the ash in the feed stream is entrained into the kiln exhaust gas. For these devices, the ash content of the hazardous waste stream is expected to have a negligible effect on total ash emissions. For this reason, there is no ash feed rate compliance limit for cement kilns or light-weight aggregate kilns. Nonetheless, cement kilns and light-weight aggregate kilns are required to initially certify that PM emissions are not likely to exceed the PM limit, and subsequently, certify through compliance testing that the PM limit is not exceeded.

Default Partitioning Value for Ash. The default assumption for partitioning of ash depends on the feed stream firing system. There are two methods by which materials may be fired into BIFs: Suspension-firing and bed-firing.

The suspension category includes atomized and lanced pumpable liquids and suspension-fired pulverized solids. The default partitioning assumption for materials fired by these systems is that 100 percent of the ash partitions to the combustion gas.

The bed-fired category consists principally of stoker boilers and raw materials (and in some cases containerized hazardous waste) fed into cement and light-weight aggregate kilns. The default partitioning assumption for materials fired on a bed is that 5 percent of the ash partitions to the combustion gas.

Converting the PM Concentration-Based Standard to a PM Mass Emission Rate. The emission limit for BIFs is 0.08 gr/dscf, corrected to 7% O₂, unless a more stringent standard applies [e.g., a New Source Performance Standard (NSPS) or a State standard implemented under the State Implementation Plan (SIP)]. To convert the 0.08 gr/dscf standard to a PM mass emission rate:

1. Determine the flue gas O₂ concentration (percent by volume, dry) and flue gas flow rate (dry standard cubic feet per minute); and
2. Calculate the allowable PM mass emission rate by multiplying the concentration-based PM emission standard times the flue gas flow rate times a dilution correction factor equal to [(21-O₂ concentration from step 1)/21-7].

9.4 Use of Engineering Judgement To Estimate Partitioning and APCS RE Values

Engineering judgement may be used in place of EPA's conservative default assumptions to estimate partitioning and APCS RE values provided that the engineering judgement is defensible and properly documented. To properly document engineering judgement, the owner/operator must keep a written record of all assumptions and calculations necessary to justify the APCS RE used. The owner/operator must provide this record to the Department upon request and must be prepared to defend the assumptions and calculations used.

If the engineering judgement is based on emissions testing, the testing will often document the emission rate of a pollutant relative to the feed rate of that pollutant rather than the partitioning factor or APCS RE.

Examples of situations where the use of engineering judgement may be supportable to estimate a partitioning factor, APCS RE, or SRE include:

- Using emissions testing data from the facility to support an SRE, even though the testing may not meet full QA/QC procedures (e.g., triplicate test runs). The closer the test results conform with full QA/QC procedures and the closer the operating conditions during the test conform with the established operating conditions for the facility, the more supportable the engineering judgement will be.

- Applying emissions testing data documenting an SRE for one metal, including nonhazardous surrogate metals to another less volatile metal.
- Applying emissions testing data documenting an SRE from one facility to a similar facility.
- Using APCS vendor guarantees of removal efficiency.

9.5 Restrictions on Use of Test Data

The measurement of an SRE or an APCS RE may be limited by the detection limits of the measurement technique. If the emission of a pollutant is undetectable, then the calculation of SRE or APCS RE should be based on the lower limit of detectability. An SRE or APCS RE of 100 percent is not acceptable.

Further, mass balance data of facility inputs, emissions, and products/residues may not be used to support a partitioning factor, given the inherent uncertainties of such procedures. Partitioning factors other than the default values may be supported based on engineering judgement, considering, for example, process chemistry. Emissions test data may be used to support an engineering judgement-based SRE, which includes both partitioning and APCS RE.

9.5 References

1. Barton, R.G., W.D. Clark, and W.R. Seeker. (1990) "Fate of Metals in Waste Combustion Systems". *Combustion Science and Technology*. 74, 1-6, p. 327

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

Section 10.0. ALTERNATIVE METHODOLOGY FOR IMPLEMENTING METALS CONTROLS

10.1 Applicability

This method for controlling metals emissions applies to cement kilns and other industrial furnaces operating under interim status that recycle emission control residue back into the furnace.

10.2 Introduction

Under this method, cement kilns and other industrial furnaces that recycle emission control residue back into the furnace must comply with a kiln dust concentration limit (i.e., a collected particulate matter (PM) limit) for each metal, as well as limits on the maximum feedrates of each of the metals in: (1) pumpable hazardous waste; and (2) all hazardous waste.

The following subsections describe how this method for controlling metals emissions is to be implemented:

- Subsection 10.3 discusses the basis of the method and the assumptions upon which it is founded;
- Subsection 10.4 provides an overview of the implementation of the method;
- Subsection 10.5 is a step-by-step procedure for implementation of the method;
- Subsection 10.6 describes the compliance procedures for this method; and
- Appendix A describes the statistical calculations and tests to be used in the method.

10.3 Basis

The viability of this method depends on three fundamental assumptions:

(1) Variations in the ratio of the metal concentration in the emitted particulate to the metal concentration in the collected kiln dust (referred to as the enrichment factor or EF) for any given metal at any given facility will fall within a normal distribution that can be experimentally determined.

(2) The metal concentrations in the collected kiln dust can be accurately and representatively measured (using procedures specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), incorporated by reference in 40 CFR 260.11).

(3) The facility will remain in compliance with the applicable particulate matter (PM) emission standard.

Given these assumptions, metal emissions can be related to the measured concentrations in the collected kiln dust by the following equation:

$$ME \frac{\text{lb Emitted Metal}}{\text{hr}} = \frac{PME \frac{\text{lb PM}}{\text{hr}} \text{ DMC} \frac{\text{lb DustMetal}}{\text{lb Dust}} \text{ EF} \frac{\text{lb EmittedMetal lb PM}}{\text{lb Dust Metal lb Dust}} \quad (1)$$

Where:

ME is the metal emitted; PME is the particulate matter emitted; DMC is the metal concentration in the collected kiln dust; and EF is the enrichment factor, which is the ratio of the metal concentration in the emitted particulate matter to the metal concentration in the collected kiln dust.

This equation can be rearranged to calculate a maximum allowable dust metal concentration limit (DMCL) by assuming worst-case conditions that: metal emissions are at the Tier III (or Tier II) limit (see 40 CFR 266.106), and that particulate emissions are at the particulate matter limit (PML):

$$DMCL \frac{\text{lb Dust Metal}}{\text{lb Dust}} = \frac{\text{Tier III Limit} \frac{\text{lb Emitted Metal}}{\text{hr}}}{\text{PML} \frac{\text{lb PM}}{\text{hr}} \text{ EF} \frac{\text{lb Emitted Metal/lb PM}}{\text{lb Dust Metal/lb Dust}}}$$

The enrichment factor used in the above equation must be determined experimentally from a minimum of 10 tests in which metal concentrations are measured in kiln dust and stack samples taken simultaneously. This approach provides a range of enrichment factors that can be inserted into a statistical distribution (t-distribution) to determine EF_{95%} and EF_{99%}. EF_{95%} is the value at which there is a 95% confidence level that the enrichment factor is below this value at any given time. Similarly, EF_{99%} is the value at which there is a 99% confidence level that the enrichment factor is below this value at any given time. EF_{95%} is used to calculate the “violation” dust metal concentration limit (DMCL):

$$DMCL_C \frac{\text{lb Dust Metal}}{\text{lbDust}} = \frac{\text{Tier III Limit} \frac{\text{lb Emitted Metal}}{\text{hr}}}{\text{PML} \frac{\text{lb PM}}{\text{hr}} \text{ EF}_{95\%} \frac{\text{lb Emitted Metal/lb PM}}{\text{lb Dust Metal/lb Dust}}} \quad (3)$$

If the kiln dust metal concentration is just above this “violation” limit, and the PM emissions are at the PM emissions limit, there is a 5% chance that the metal emissions are above the Tier III limit. In such a case, the facility would be in violation of the metals standard.

To provide a margin of safety, a second, more conservative kiln dust metal concentration limit is also used. This “conservative” dust metal concentration limit (DMCL_c) is calculated using a “safe” enrichment factor (SEF). If EF_{99%} is greater than two times the value of EF_{95%}, the “safe” enrichment factor can be calculated using Equation 4a:

$$SEF > 2EF_{95\%} \quad (4a)$$

If EF_{99%} is not greater than two times the value of EF_{95%}, the “safe” enrichment factor can be calculated using Equation 4b:

$$SEF > EF_{99\%} \quad (4b)$$

In cases where the enrichment factor cannot be determined because the kiln dust metal concentration is nondetectable, the “safe” enrichment factor is as follows:

$$SEF = 100 \quad (4c)$$

For all cases, the “conservative” dust metal concentration limit is calculated using the following equation:

$$DMCL_v \frac{\text{lb Dust Metal}}{\text{lb Dust}} = \frac{\text{Tier III Limit} \frac{\text{lb Emitted Metal}}{\text{hr}}}{\text{PML} \frac{\text{lb PM}}{\text{(hr)}} \text{ SEF} \frac{\text{lb Emitted Metal/lb PM}}{\text{(lb Dust Metal/lb Dust)}}} \quad (5)$$

If the kiln dust metal concentration at a facility is just above the “conservative” limit based on that “safe” enrichment factor provided in Equation 4a, and the PM emissions are at the PM emissions limit, there is a 5% chance that the metal emissions are above one-half the Tier III limit. If the kiln dust metal concentration at the facility is just above the “conservative” limit based on the “safe” enrichment factor provided in Equation 4b, and the PM emissions are at the PM emissions limit, there is a 1% chance that the metal emissions are above the Tier III limit. In either case, the facility would be unacceptably close to a violation. If this situation occurs more than 5% of the time, the facility would be required to rerun the series of 10 tests to determine the enrichment factor. To avoid this expense, the facility would be advised to reduce its metals feedrates or to take other appropriate measures to maintain its kiln dust metal concentrations in compliance with the “conservative” dust metal concentration limits.

In cases where the enrichment factor cannot be determined because the kiln dust metal concentration is nondetectable, and thus no $EF_{95\%}$ exists, the “violation” dust metal concentration limit is set at ten times the “conservative” limit:

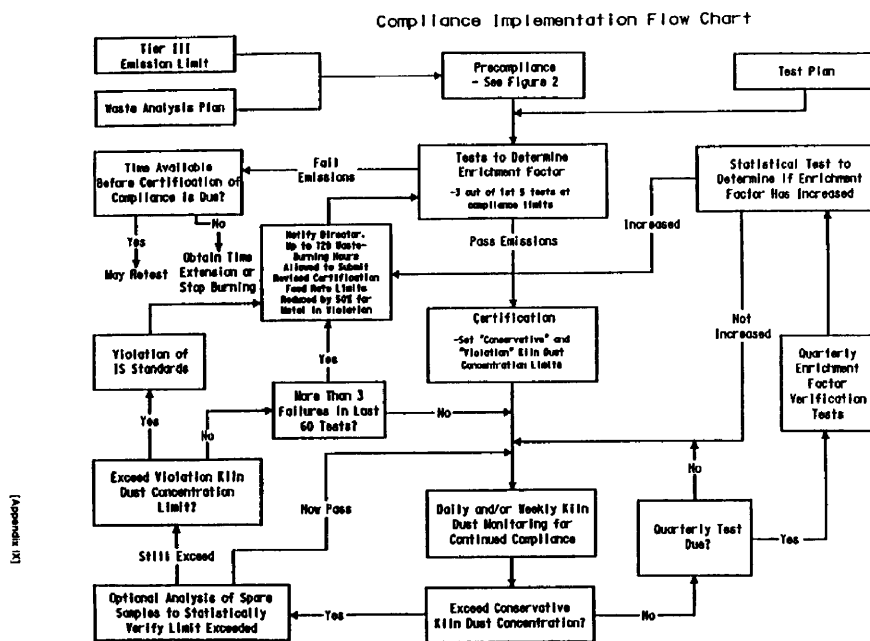
$$DMCL_v = 10 \times DMCL_c \quad (6)$$

10.4 Overview

The flowchart for implementing the method is shown in Figure 10.4-1. The general procedure is as follows:

- Follow the certification of precompliance procedures described in subsection 10.6 (to comply with 40 CFR 266.103(b)).
- For each metal of concern, perform a series of tests to establish the relationship (enrichment factor) between the concentration of emitted metal and the metal concentration in the collected kiln dust.
- Use the demonstrated enrichment factor, in combination with the Tier III (or Tier II) metal emission limit and the most stringent applicable particulate emission limit, to calculate the “violation” and “conservative” dust metal concentration limits. Include this information with the certification of compliance under 266.103(c).
- Perform daily and/or weekly monitoring of the cement kiln dust metal concentration to ensure (with appropriate QA/QC) that the metal concentration does not exceed either limit.
 - If the cement kiln dust metal concentration exceeds the “conservative” limit more than 5% of the time (i.e., more than three failures in last 60 tests), the series of tests to determine the enrichment factor must be repeated.
 - If the cement kiln dust metal concentration exceeds the “violation” limit, a violation has occurred.
- Perform quarterly tests to verify that the enrichment factor has not increased significantly. If the enrichment factor has increased, the series of tests to determine the enrichment factor must be repeated.

Figure 10.4-1



10.5 Implementation Procedures

A step-by-step description for implementing the method is provided below:

(1) Prepare initial limits and test plans.

- Determine the Tier III metal emission limit. The Tier II metal emission limit may also be used (see 266.106).
- Determine the applicable PM emission standard. This standard is the most stringent particulate emission standard that applies to the facility. A facility may elect to restrict itself to an even more stringent self-imposed PM emission standard, particularly if the facility finds that it is easier to control particulate emissions than to reduce the kiln dust concentration of a certain metal (i.e., lead).
- Determine which metals need to be monitored (i.e., all hazardous metals for which Tier III emission limits are lower than PM emission limits—assuming PM is pure metal).
- Follow the compliance procedures described in Subsection 10.6.
- Follow the guidelines described in SW-846 for preparing test plans and waste analysis plans for the following tests:
 - Compliance tests to determine limits on metal feedrates in pumpable hazardous wastes and in all hazardous wastes (as well as to determine other compliance parameters);
 - Initial tests to determine enrichment factors;
 - Quarterly tests to verify enrichment factors;
 - Analysis of hazardous waste feedstreams; and
 - Daily and/or weekly monitoring of kiln dust for continuing compliance.

(2) Conduct tests to determine the enrichment factor.

- These tests must be conducted within a 14-day period. No more than two tests may be conducted in any single day. If the tests are not completed within a 14-day period, they must be repeated.

- Simultaneous stack samples and kiln dust samples must be taken.

- Stack sampling must be conducted with the multiple metals train according to procedures provided in section 10.3 of this Methods Manual.

- Kiln dust sampling must be conducted as follows:

- Follow the sampling and analytical procedures described in SW-846 and the waste analysis plan as they pertain to the condition and accessibility of the dust.

- Samples should be representative of the last ESP or Fabric Filter in the APCS series.

- The feedrates of hazardous metals in all pumpable hazardous waste streams and in all hazardous waste streams must be monitored during these tests. It is recommended (but not required) that the feedrates of hazardous metals in all feedstreams also be monitored.

- At least ten single (noncomposited) runs are required during the tests.

- The facility must follow a normal schedule of kiln dust recharging for all of the tests.

- Three of the first five tests must be compliance tests in conformance with 266.103(c); i.e., they must be used to determine maximum allowable feedrates of metals in pumpable hazardous wastes, and in all hazardous wastes, as well as to determine other compliance limits (see 266.103(c)(1)).

- The remainder of the tests need not be conducted under full compliance test conditions; however, the facility must operate at its compliance test production rate, and it must burn hazardous waste during these tests such that the feedrate of each metal for pumpable and total hazardous wastes is at least 25% of the feedrate during compliance testing. If these criteria, and those discussed below, are not met for any parameter during a test, then either the test is not valid for determining enrichment factors under this method, or the compliance limits for that parameter must be established based on these test conditions rather than on the compliance test conditions.

- Verify that compliance emission limits are not exceeded.

- Metal emissions must not exceed Tier III (or Tier II) limits.

- PM emissions must not exceed the most stringent of applicable PM standards (or an optional self-imposed particulate standard).

- The facility must generate normal, marketable product using normal raw materials and fuels under normal operating conditions (for parameters other than those specified under this method) when these tests are conducted.

- Chromium must be treated as a special case:

- The enrichment factor for total chromium is calculated in the same way as the enrichment factor for other metals (i.e., the enrichment factor is the ratio of the concentration of total chromium in the emitted particulate matter to the concentration of total chromium in the collected kiln dust).

- The enrichment factor for hexavalent chromium (if measured) is defined as the ratio of the concentration of hexavalent chromium in the emitted particulate matter to the concentration of total chromium in the collected kiln dust.

(3) Use the enrichment factors measured in Step 2 to determine EF_{95%}, EF_{99%}, and SEF.

- Calculate EF_{95%} and EF_{99%} according to the t-distribution as described in Appendix A

- Calculate SEF by

- Equation 4a if EF_{95%} is determinable and if EF_{99%} is greater than two times EF_{95%},

- Equation 4b if EF_{95%} is determinable and if EF_{99%} is not greater than two times EF_{95%}.

- Equation 4c if EF_{95%} is not determinable.

The facility may choose to set an even more conservative SEF to give itself a larger margin of safety between the point where corrective action is necessary and the point where a violation occurs.

(4) Prepare certification of compliance.

- Calculate the “conservative” dust metal concentration limit (DMCL_C) using Equation 5.

–Chromium is treated as a special case. The “conservative” kiln dust chromium concentration limit is set for total chromium, not for hexavalent chromium. The limit for total chromium must be calculated using the Tier III (or Tier II) metal limit for hexavalent chromium.

–If the stack samples described in Step 2 were analyzed for hexavalent chromium, the SEF based on the hexavalent chromium enrichment factors (as defined in Step 2) must be used in this calculation.

–If the stack samples were not analyzed for hexavalent chromium, then the SEF based on the total chromium enrichment factor must be used in this calculation.

- Calculate the “violation” dust metal concentration limit (DMCL_v) using Equation 3 if EF_{95%} is determinable, or using Equation 6 if EF_{95%} is not determinable.

–Chromium is treated as a special case. The “violation” kiln dust chromium concentration limit is set for total chromium, not for hexavalent chromium. The limit for total chromium must be calculated using the Tier III (or Tier II) metal limit for hexavalent chromium.

–If the stack samples taken in Step 2 were analyzed for hexavalent chromium, the EF_{95%} based on the hexavalent chromium enrichment factor (as defined in Step 2) should be used in this calculation.

–If the stack samples were not analyzed for hexavalent chromium, the EF_{95%} based on the total chromium enrichment factor must be used in this calculation.

- Submit certification of compliance.

- Steps 2–4 must be repeated for recertification, which is required once every 3 years (see 266.103(d)).

(5) Monitor metal concentrations in kiln dust for continuing compliance, and maintain compliance with all compliance limits for the duration of interim status.

- Metals to be monitored during compliance testing are classified as either “critical” or “noncritical” metals.

- All metals must initially be classified as “critical” metals and be monitored on a daily basis.

- A “critical” metal may be reclassified as a “noncritical” metal if its concentration in the kiln dust remains below 10% of its “conservative” kiln dust metal concentration limit for 30 consecutive daily samples. “Noncritical” metals must be monitored on a weekly basis.

- A “noncritical” metal must be reclassified as a “critical” metal if its concentration in the kiln dust is above 10% of its “conservative” kiln dust metal concentration limit for any single daily or weekly sample.

- Noncompliance with the sampling and analysis schedule prescribed by this method is a violation of the metals controls under 266.103.

- Follow the sampling, compositing, and analytical procedures described in this method and in SW-846 as they pertain to the condition and accessibility of the kiln dust.

- Follow the same procedures and sample at the same locations as were used for kiln dust samples collected to determine the enrichment factors (as discussed in Step 2).

- Samples must be collected at least once every 8 hours, and a daily composite must be prepared according to SW-846 procedures.

- At least one composite sample is required. This sample is referred to as the “required” sample.

- For QA/QC purposes, a facility may elect to collect two or more additional samples. These samples are referred to as the “spare” samples. These additional samples must be collected over the same time period and according to the same procedures as those used for the “required” sample.

- Samples for “critical” metals must be daily composites.

- Samples for “noncritical” metals must be weekly composites. These samples can be composites of the original 8-hour samples, or they can be composites of daily composite samples.

- Analyze the “required” sample to determine the concentration of each metal.

-This analysis must be completed within 48 hours of the close of the sampling period. Failure to meet this schedule is a violation of the metals standards of 266.103.

- If the “conservative” kiln dust metal concentration limit is exceeded for any metal, refer to Step 8.

- If the “conservative” kiln dust metal concentration limit is not exceeded, continue with the daily or weekly monitoring (Step 5) for the duration of interim status.

- Conduct quarterly enrichment factor verification tests, as described in Step 6.

(6) Conduct quarterly enrichment factor verification tests.

- After certification of compliance with the metals standards, a facility must conduct quarterly enrichment factor verification tests every three months for the duration of interim status. The first quarterly test must be completed within three months of certification (or recertification). Each subsequent quarterly test must be completed within three months of the preceding quarterly test. Failure to meet this schedule is a violation.

- Simultaneous stack samples and kiln dust samples must be collected.

- Follow the same procedures and sample at the same locations as were used for kiln dust samples and stack samples collected to determine the enrichment factors (as discussed in Step 2).

- At least three single (noncomposited) runs are required. These tests need not be conducted under the operating conditions of the initial compliance test; however, the facility must operate under the following conditions:

- It must operate at compliance test production rate.

- It must burn hazardous waste during the test, and for the 2-day period immediately preceding the test, such that the feedrate of each metal for pumpable and total hazardous wastes consist of at least 25% of the operating limits established during the compliance test.

- It must remain in compliance with all compliance parameters (see 266.103(c)(1)).

- It must follow a normal schedule of kiln dust recharging.

- It must generate normal marketable product from normal raw materials during the tests.

(7) Conduct a statistical test to determine if the enrichment factors measured in the quarterly verification tests have increased significantly from the enrichment factors determined in the tests conducted in Step 2. The enrichment factors have increased significantly if all three of the following criteria are met:

- By applying the t-test described in appendix A, it is determined that the enrichment factors measured in the quarterly tests are not taken from the same population as the enrichment factors measured in the Step 2 tests;

- The $EF_{95\%}$ calculated for the combined data sets (i.e., the quarterly test data and the original Step 2 test data) according to the t-distribution (described in appendix A) is more than 10% higher than the $EF_{95\%}$ based on the enrichment factors previously measured; in Step 2; and

- The highest measured kiln dust metal concentration recorded in the previous quarter is more than 10% of the “violation” kiln dust concentration limit that would be calculated from the combined $EF_{95\%}$.

If the enrichment factors have increased significantly, the tests to determine the enrichment factors must be repeated (refer to Step 11). If the enrichment factors have not increased significantly, continue to use the kiln dust metal concentration limits based on the enrichment factors previously measured in Step 2, and continue with the daily and/or weekly monitoring described in Step 5.

(8) If the “conservative” kiln dust metal concentration limit was exceeded for any metal in any single analysis of the “required” kiln dust sample, the “spare” samples corresponding to the same period may be analyzed to determine if the exceedance was due to a sampling or analysis error.

- If no “spare” samples were taken, refer to Step 9.

- If the average of all the samples for a given day (or week, as applicable) (including the “required” sample and the “spare” samples) does not exceed the “conservative” kiln dust metal

concentration limit, no corrective measures are necessary; continue with the daily and/or weekly monitoring as described in Step 5.

- If the average of all the samples for a given day (or week, as applicable) exceeds the “conservative” kiln dust metal concentration limit, but the average of the “spare” samples is below the “conservative” kiln dust metal concentration limit, apply the Q-test, described in appendix A, to determine whether the “required” sample concentration can be judged as an outlier.

- If the “required” sample concentration is judged an outlier, no corrective measures are necessary; continue with the daily and/or weekly monitoring described in Step 5.

- If the “required” sample concentration is not judged an outlier, refer to Step 9.

(9) Determine if the “violation” kiln dust metal concentration has been exceeded based on either the average of all the samples collected during the 24-hour period in question, or if discarding an outlier can be statistically justified by the Q-test described in appendix A, on the average of the remaining samples.

- If the “violation” kiln dust metal concentration limit has been exceeded, a violation of the metals controls under 266.103(c) has occurred. Notify the Department that a violation has occurred. Hazardous waste may be burned for testing purposes for up to 720 operating hours to support a revised certification of compliance. Note that the Department may grant an extension of the hours of hazardous waste burning under 266.103(c)(7) if additional burning time is needed to support a revised certification for reasons beyond the control of the owner or operator. Until a revised certification of compliance is submitted to the Department, the feedrate of the metals in violation in total and pumpable hazardous waste feeds is limited to 50% of the previous compliance test limits.

- If the “violation” kiln dust metal concentration has not been exceeded:

- If the exceedance occurred in a daily composite sample, refer to Step 10.

- If the exceedance occurred in a weekly composite sample, refer to Step 11.

(10) Determine if the “conservative” kiln dust metal concentration limit has been exceeded more than three times in the last 60 days.

- If not, log this exceedance and continue with the daily and/or weekly monitoring (Step 5).

- If so, the tests to determine the enrichment factors must be repeated (refer to Step 11).

- This determination is made separately for each metal; For example,

- Three exceedances for each of the ten hazardous metals are allowed within any 60-day period.

- Four exceedances of any single metal in any 60-day period is not allowed.

- This determination should be made daily, beginning on the first day of daily monitoring. For example, if four exceedances of any single metal occur in the first four days of daily monitoring, do not wait until the end of the 60-day period; refer immediately to Step 11.

(11) The tests to determine the enrichment factor must be repeated if: (1) More than three exceedances of the “conservative” kiln dust metal concentration limit occur within any 60 consecutive daily samples; (2) an excursion of the “conservative” kiln dust metal concentration limit occurs in any weekly sample; or (3) a quarterly test indicates that the enrichment factors have increased significantly.

- The facility must notify the Department if these tests must be repeated.

- The facility has up to 720 hazardous-waste-burning hours to redetermine the enrichment factors for the metal or metals in question and to recertify (beginning with a return to Step 2). During this period, the facility must reduce the feed rate of the metal in violation by 50%. If the facility has not completed the recertification process within this period, it must stop burning or obtain an extension. Hazardous waste burning may resume only when the recertification process (ending with Step 4) has been completed.

- Meanwhile, the facility must continue with daily kiln dust metals monitoring (Step 5) and must remain in compliance with the “violation” kiln dust metal concentration limits (Step 9).

10.6 Precompliance Procedures

Cement kilns and other industrial furnaces that recycle emission control residue back into the furnace must comply with the same certification schedules and procedures (with the few exceptions described below) that apply to other boilers and industrial furnaces. These schedules and procedures, as set forth in 266.103, require no later than the effective date of the rule, each facility submit a certification which establishes precompliance limits for a number of compliance parameters (see 266.103(b)(3)), and that each facility immediately begin to operate under these limits.

These precompliance limits must ensure that interim status emissions limits for hazardous metals, particulate matter, HCl, and Cl₂ are not likely to be exceeded. Determination of the values of the precompliance limits must be made based on either (1) conservative default assumptions provided in this Methods Manual, or (2) engineering judgement.

The flowchart for implementing the precompliance procedures is shown in Figure 10.6-1. The step-by-step precompliance implementation procedure is described below. The precompliance implementation procedures and numbering scheme are similar to those used for the compliance procedures described in Subsection 10.5.

(1) Prepare initial limits and test plans.

- Determine the Tier III metal emission limit. The Tier II metal emission limit may also be used (see 40 CFR 266.106).

- Determine the applicable PM emission standard. This standard is the most stringent particulate emission standard that applies to the facility. A facility may elect to restrict itself to an even more stringent self-imposed PM emission standard, particularly if the facility finds that it is easier to control particulate emissions than to reduce the kiln dust concentration of a certain metal (i.e., lead).

- Determine which metals need to be monitored (i.e., all hazardous metals for which Tier III emission limits are lower than PM emission limits, assuming PM is pure metal).

- Follow the procedures described in SW-846 for preparing waste analysis plans for the following tasks:

- Analysis of hazardous waste feedstreams.

- Daily and/or weekly monitoring of kiln dust concentrations for continuing compliance.

(2) Determine the “safe” enrichment factor for precompliance. In this context, the “safe” enrichment factor is a conservatively high estimate of the enrichment factor (the ratio of the emitted metal concentration to the metal concentration in the collected kiln dust). The “safe” enrichment factor must be calculated from either conservative default values, or engineering judgement.

- Conservative default values for the “safe” enrichment factor are as follows:

SEF = 10 for all hazardous metals except mercury. SEF = 10 for antimony, arsenic, barium, beryllium, cadmium, chromium, lead, silver, and thallium.

SEF = 100 for mercury.

- Engineering judgement may be used in place of conservative default assumptions provided that the engineering judgement is defensible and properly documented. The facility must keep a written record of all assumptions and calculations necessary to justify the SEF. The facility must provide this record to the Department upon request and must be prepared to defend these assumptions and calculations.

Examples of situations where the use of engineering judgement is appropriate include:

- Use of data from precompliance tests;

- Use of data from previous compliance tests; and

- Use of data from similar facilities.

(3) This step does not apply to precompliance procedures.

(4) Prepare certification of precompliance.

- Calculate the “conservative” dust metal concentration limit (DMCLc) using Equation 5.

- Submit certification of precompliance. This certification must include precompliance limits for all compliance parameters that apply to other boilers and industrial furnaces (i.e., those that do not recycle emission control residue back into the furnace) as listed in 266.103(b)(3), except that it is not necessary to set precompliance limits on maximum feedrate of each hazardous metal in all combined feedstreams.

- Furnaces that recycle collected PM back into the furnace (and that elect to comply with this method (see 266.103(c)(3)(ii)) are subject to a special precompliance parameter, however. They must establish precompliance limits on the maximum concentration of each hazardous metal in collected kiln dust. (which must be set according to the procedures described above).

(5) Monitor metal concentration in kiln dust for continuing compliance, and maintain compliance with all precompliance limits until certification of compliance has been submitted.

- Metals to be monitored during precompliance testing are classified as either “critical” or “noncritical” metals.

- All metals must initially be classified as “critical” metals and be monitored on a daily basis.

- A “critical” metal may be reclassified as a “noncritical” metal if its concentration in the kiln dust remains below 10% of its “conservative” kiln dust metal concentration limit for 30 consecutive daily samples. “Noncritical” metals must be monitored on a weekly basis, at a minimum.

- A “noncritical” metal must be reclassified as a “critical” metal if its concentration in the kiln dust is above 10% of its “conservative” kiln dust metal concentration limit for any single daily or weekly sample.

- It is a violation if the facility fails to analyze the kiln dust for any “critical” metal on any single day or for any “noncritical” metal during any single week, when hazardous waste is burned.

- Follow the sampling, compositing, and analytical procedures described in this method and in SW-846 as they pertain to the condition and accessibility of the kiln dust.

- Samples must be collected at least once every 8 hours, and a daily composite prepared according to SW-846 procedures.

- At least one composite sample is required. This sample is referred to as the “required” sample.

- For QA/QC purposes, a facility may elect to collect two or more additional samples. These samples are referred to as the “spare” samples. These additional samples must be collected over the same time period and according to the same procedures as those used for the “required” sample.

- Samples for “critical” metals must be daily composites.

- Samples for “noncritical” metals must be weekly composites, at a minimum. These samples can be composites of the original 8-hour samples, or they can be composites of daily composite samples.

- Analyze the “required” sample to determine the concentration of each metal.

- This analysis must be completed within 48 hours of the close of the sampling period. Failure to meet this schedule is a violation.

- If the “conservative” kiln dust metal concentration limit is exceeded for any metal, refer to Step 8.

- If the “conservative” kiln dust metal concentration limit is not exceeded, continue with the daily and/or weekly monitoring (Step 5) for the duration of interim status.

(6) This step does not apply to precompliance procedures.

(7) This step does not apply to precompliance procedures.

(8) If the “conservative” kiln dust metal concentration limit was exceeded for any metal in any single analysis of the “required” kiln dust sample, the “spare” samples corresponding to the same period may be analyzed to determine if the exceedance is due to a sampling or analysis error.

- If no “spare” samples were taken, refer to Step 9.

- If the average of all the samples for a given day (or week, as applicable) (including the “required” sample and the “spare” samples) does not exceed the “conservative” kiln dust metal concentration limit, no corrective measures are necessary; continue with the daily and/or weekly monitoring as described in Step 5.

- If the average of all the samples for a given day (or week, as applicable) exceeds the “conservative” kiln dust metal concentration limit, but the average of the “spare” samples is below the “conservative” kiln dust metal concentration limit, apply the Q-test, described in appendix A, to determine whether the “required” sample concentration can be judged as an outlier.

- If the “required” sample concentration is judged an outlier, no corrective measures are necessary; continue with the daily and/or weekly monitoring described in Step 5.

- If the “required” sample concentration is not judged an outlier, refer to Step 10.

(9) This step does not apply to precompliance procedures.

(10) Determine if the “conservative” kiln dust metal concentration limit has been exceeded more than three times in the last 60 days.

- If not, log this exceedance and continue with the daily and/or weekly monitoring (Step 5).

- If so, the tests to determine the enrichment factors must be repeated (refer to Step 11).

- This determination is made separately for each metal; for example

- Three exceedances for each of the ten hazardous metals are allowed within any 60-day period.

- Four exceedances of any single metal in any 60-day period is not allowed.

- This determination should be made daily, beginning on the first day of daily monitoring. For example, if four exceedances of any single metal occur in the first four days of daily monitoring, do not wait until the end of the 60-day period; refer immediately to Step 11.

(11) A revised certification of precompliance must be submitted to the Department (or certification of compliance must be submitted) if: (1) More than three exceedances of the “conservative” kiln dust metal concentration limit occur within any 60 consecutive daily samples; or (2) an exceedance of the “conservative” kiln dust metal concentration limit occurs in any weekly sample.

- The facility must notify the Department if a revised certification of precompliance must be submitted.

- The facility has up to 720 waste-burning hours to submit a certification of compliance or a revised certification of precompliance. During this period, the feed rate of the metal in violation must be reduced by 50%. In the case of a revised certification of precompliance, engineering judgement must be used to ensure that the “conservative” kiln dust metal concentration will not be exceeded. Examples of how this goal might be accomplished include:

- Changing equipment or operating procedures to reduce the kiln dust metal concentration;

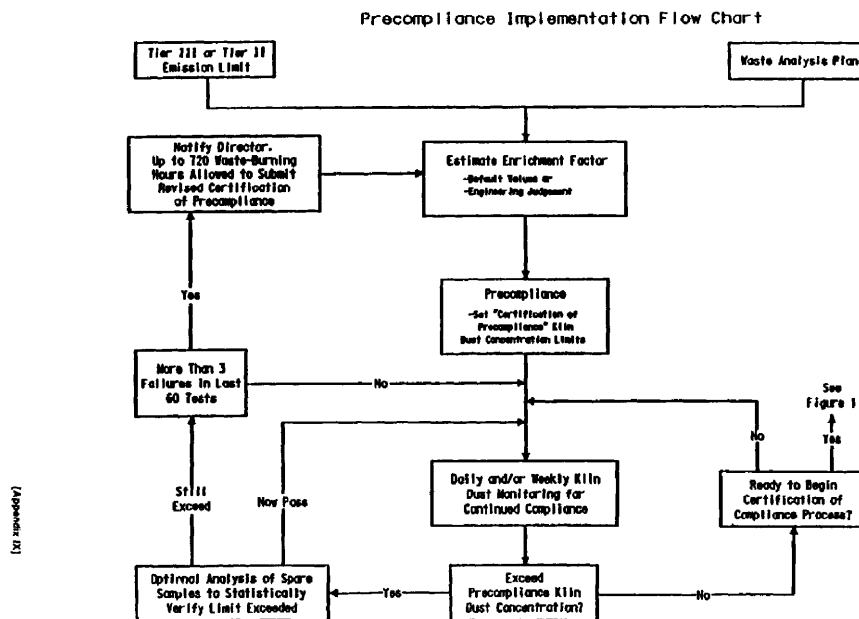
- Changing equipment or operating procedures, or using more detailed engineering judgement, to decrease the estimated SEF and thus increase the “conservative” kiln dust metal concentration limit;

- Increasing the “conservative” kiln dust metal concentration limit by imposing a stricter PM emissions standard; or

- Increasing the “conservative” kiln dust metal concentration limit by performing a more detailed risk assessment to increase the metal emission limits.

- Meanwhile, the facility must continue with daily kiln dust metals monitoring (Step 5).

Figure 10.6-1



APPENDIX A. TO APPENDIX IX TO PART 266 STATISTICS

SECTION A.1. Determination of Enrichment Factor

After at least 10 initial emissions tests are performed, an enrichment factor for each metal must be determined. At the 95% confidence level, the enrichment factor, $EF_{95\%}$, is based on the test results and is statistically determined so there is only a 5% chance that the enrichment factor at any given time will be larger than $EF_{95\%}$. Similarly, at the 99% confidence level, the enrichment factor, $EF_{99\%}$, is statistically determined so there is only a 1% chance that the enrichment factor at any given time will be larger than $EF_{99\%}$.

For a large number of samples ($n \geq 30$), $EF_{95\%}$ is based on a normal distribution, and is equal to:

$$EF_{95\%} = EF + 2.0 \quad (1)$$

where:

$$EF = \frac{\sum_{i=1}^n EF_i}{n} \quad (2).$$

$$s = \left[\frac{\sum_{i=1}^n (EF_i - EF)^2}{n-1} \right]^{1/2} \quad (3)$$

For a 95% confidence level, z_c is equal to 1.645.

For a small number of samples ($n < 30$), $EF_{95\%}$ is based on the t-distribution and is equal to:

$$EF_{95\%} = EF + t_c S \quad (4)$$

where the standard deviation, S is defined as:

$$s = \left[\frac{\sum_{i=1}^n (EF_i - EF)^2}{n-1} \right]^{1/2} \quad (5)$$

t_c is a function of the number of samples and the confidence level that is desired. It increases in value as the sample size decreases and the confidence level increases. The 95% confidence level is used in this method to calculate the "violation" kiln dust metal concentration limit; and the 99% confidence level is sometimes used to calculate the "conservative" kiln dust metal concentration limit. Values of t_c are shown in table A-1 for various degrees of freedom (degrees of freedom = sample size-1) at the 95% and 99% confidence levels. As the sample size approaches infinity, the normal distribution is approached.

A.2 Comparison of Enrichment Factor Groups

To determine if the enrichment factors measured in the quarterly tests are significantly different from the enrichment factors determined in the initial Step 2 tests, the t-test is used. In this test, the value t_{MEAS} :

$$t_{MEAS} = \frac{EF_1 - EF_2}{s \left(\frac{1}{n_1} + \frac{1}{n_2} \right)^{1/2}} \quad (6)$$

Table A-1.-T-Distribution

$n-1$ or $n_1 + n_2 - 2$	t_{95}	t_{99}
1	6.31	31.82
2	2.92	6.96
3	2.35	4.54
4	2.13	3.75
5	2.02	3.36
6	1.94	3.14

n-1 or n ₁ + n ₂ - 2	t ₉₅	t ₉₉
7	1.90	3.00
8	1.86	2.90
9	1.83	2.82
10	1.81	2.76
11	1.80	2.72
12	1.78	2.68
13	1.77	2.65
14	1.76	2.62
15	1.75	2.60
16	1.75	2.58
17	1.74	2.57
18	1.73	2.55
19	1.73	2.54
20	1.72	2.53
25	1.71	2.48
30	1.70	2.46
40	1.68	2.42
60	1.67	2.39
120	1.66	2.36
∞	1.645	2.33

$$\sigma_f = \left(\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \right)^{\frac{1}{2}} \quad (7)$$

is compared to t_{CRIT} at the desired confidence level. The 95% confidence level is used in this method. Values of t_{CRIT} are shown in table A-1 for various degrees of freedom (degrees of freedom n₁ + n₂ - 2) at the 95% and 99% confidence levels. If t_{MEAS} is greater than t_{CRIT}, it can be concluded with 95% confidence that the two groups are not from the same population.

A.3 Rejection of Data

If the concentration of any hazardous metal in the “required” kiln dust sample exceeds the kiln dust metal concentration limit, the “spare” samples are analyzed. If the average of the combined “required” and “spare” values is still above the limit, a statistical test is used to decide if the upper value can be rejected.

The “Q-test” is used to determine if a data point can be rejected. The difference between the questionable result and its neighbor is divided by the spread of the entire data set. The resulting ratio, Q_{meas}, is then compared with rejection values that are critical for a particular degree of confidence, where Q_{meas} is:

$$\sigma_{\text{meas}} = \frac{DMC_{\text{highest}} - DMC_{\text{next highest}}}{DMC_{\text{highest}} - DMC_{\text{lowest}}}$$

The 90% confidence level for data rejection is used in this method. Table A-2 provides the values of Q_{CIT} at the 90% confidence level. If Q_{MEAS} is larger than Q_{CIT}, the data point can be discarded. Only one data point from a sample group can be rejected using this method.

Table A-2.—Critical Values for Use in the Q-Test

n	Q _{crit}
3	0.94

n	θ_{crit}
4	0.76
5	0.64
6	0.56
7	0.51
8	0.47
9	0.44
10	0.41

HISTORY: Added by State Register Volume 17, Issue No. 5, Part 2, eff May 28, 1993.

APPENDIX X. Guideline On Air Quality Models (Removed)

Editor's Note

Appendix X—removed December, 1993.

APPENDIX XI. Lead-Bearing Materials that may be Processed in Exempt Lead Smelters

A. Exempt Lead-Bearing Materials When Generated or Originally Produced By Lead-Associated Industries ¹

- Acid dump/fill solids
- Sump mud
- Materials from laboratory analyses
- Acid filters
- Baghouse bags
- Clothing (e.g., coveralls, aprons, shoes, hats, gloves)
- Sweepings
- Air filter bags and cartridges
- Respiratory cartridge filters
- Shop abrasives
- Stacking boards
- Waste shipping containers (e.g., cartons, bags, drums, cardboard)
- Paper hand towels
- Wiping rags and sponges
- Contaminated pallets
- Water treatment sludges, filter cakes, residues, and solids
- Emission control dusts, sludges, filter cakes, residues, and solids from lead-associated industries (e.g., K069 and D008 wastes)
- Spent grids, posts, and separators
- Spent batteries
- Lead oxide and lead oxide residues
- Lead plates and groups
- Spent battery cases, covers, and vents
- Pasting belts
- Water filter media
- Cheesecloth from pasting rollers
- Pasting additive bags
- Asphalt paving materials

¹ Lead-associated industries are lead smelters, lead-acid battery manufacturing, and lead chemical manufacturing (e.g., manufacturing of lead oxide or other lead compounds).

B. Exempt Lead-Bearing Materials When Generated or Originally Produced By Any Industry

Charging jumpers and clips

Platen abrasive

Fluff from lead wire and cable casings

Lead-based pigments and compounding pigment dust

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

APPENDIX XII. Nickel or Chromium-Bearing Materials that may be Processed in Exempt Nickel-Chromium Recovery Furnaces

A. Exempt Nickel or Chromium-Bearing Materials when Generated by Manufacturers or Users of Nickel, Chromium, or Iron

Baghouse bags

Raney nickel catalyst

Floor sweepings

Air filters

Electroplating bath filters

Wastewater filter media

Wood pallets

Disposable clothing (coveralls, aprons, hats, and gloves)

Laboratory samples and spent chemicals

Shipping containers and plastic liners from containers or vehicles used to transport nickel or chromium-containing wastes

Respirator cartridge filters

Paper hand towels

B. Exempt Nickel or Chromium-Bearing Materials when Generated by Any Industry

Electroplating wastewater treatment sludges (F006)

Nickel and/or chromium-containing solutions

Nickel, chromium, and iron catalysts

Nickel-cadmium and nickel-iron batteries

Filter cake from wet scrubber system water treatment plants in the specialty steel industry ¹

Filter cake from nickel-chromium alloy pickling operations ¹

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

¹ If a hazardous waste under an authorized State program.

APPENDIX XIII. Mercury Bearing Wastes That May Be Processed in Exempt Mercury Recoverable Units

These are exempt mercury-bearing materials with less than 500 ppm of 261, appendix VIII organic constituents when generated by manufacturers or users of mercury or mercury products.

1. Activated carbon
2. Decomposer graphite
3. Wood
4. Paper
5. Protective clothing
6. Sweepings
7. Respiratory cartridge filters
8. Cleanup articles

9. Plastic bags and other contaminated containers
10. Laboratory and process control samples
11. K106 and other wastewater treatment plant sludge and filter cake
12. Mercury cell sump and tank sludge
13. Mercury cell process solids
14. Recoverable levels of mercury contained in soil

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

SUBPART O

[RESERVED]

SUBPART P

HAZARDOUS WASTE PHARMACEUTICALS

266.500. Definitions for this subpart.

The following definitions apply to this subpart:

“Evaluated hazardous waste pharmaceutical” means a prescription hazardous waste pharmaceutical that has been evaluated by a reverse distributor in accordance with Section 266.510(a)(3) and will not be sent to another reverse distributor for further evaluation or verification of manufacture credit.

“Hazardous waste pharmaceutical” means a pharmaceutical that is a solid waste, as defined in Section 261.2, and exhibits one or more characteristics identified in part 261 subpart C or is listed in part 261, subpart D. A pharmaceutical is not a solid waste, as defined in Section 261.2, and therefore not a hazardous waste pharmaceutical, if it is legitimately used/reused (e.g., lawfully donated for its intended purpose) or reclaimed. An over-the-counter pharmaceutical, dietary supplement, or homeopathic drug is not a solid waste, as defined in Section 261.2, and therefore not a hazardous waste pharmaceutical, if it has a reasonable expectation of being legitimately used/reused (e.g., lawfully redistributed for its intended purpose) or reclaimed.

“Healthcare facility” means any person that is lawfully authorized to —

(1) provide preventative, diagnostic, therapeutic, rehabilitative, maintenance or palliative care, and counseling, service, assessment or procedure with respect to the physical or mental condition, or functional status, of a human or animal or that affects the structure or function of the human or animal body; or

(2) distribute, sell, or dispense pharmaceuticals, including over-the-counter pharmaceuticals, dietary supplements, homeopathic drugs, or prescription pharmaceuticals. This definition includes, but is not limited to, wholesale distributors, third-party logistics providers that serve as forward distributors, military medical logistics facilities, hospitals, psychiatric hospitals, ambulatory surgical centers, health clinics, physicians’ offices, optical and dental providers, chiropractors, long-term care facilities, ambulance services, pharmacies, long-term care pharmacies, mail-order pharmacies, retailers of pharmaceuticals, veterinary clinics, and veterinary hospitals. This definition does not include pharmaceutical manufacturers, reverse distributors, or reverse logistics centers.

“Household waste pharmaceutical” means a pharmaceutical that is a solid waste, as defined in Section 261.2, but is excluded from being a hazardous waste under Section 261.4(b)(1).

“Long-term care facility” means a licensed entity that provides assistance with activities of daily living, including managing and administering pharmaceuticals to one or more individuals at the facility. This definition includes, but is not limited to, hospice facilities, nursing facilities, skilled nursing facilities, and the nursing and skilled nursing care portions of continuing care retirement communities. Not included within the scope of this definition are group homes, independent living communities, assisted living facilities, and the independent and assisted living portions of continuing care retirement communities.

“Non-creditable hazardous waste pharmaceutical” means a prescription hazardous waste pharmaceutical that does not have a reasonable expectation to be eligible for manufacturer credit or a nonprescription hazardous waste pharmaceutical that does not have a reasonable expectation to be legitimately used/reused or reclaimed. This includes but is not limited to, investigational drugs, free samples of pharmaceuticals received by healthcare facilities, residues of pharmaceuticals remaining in empty

containers, contaminated personal protective equipment, floor sweepings, and clean-up material from the spills of pharmaceuticals.

“Non-hazardous waste pharmaceutical” means a pharmaceutical that is a solid waste, as defined in Section 261.2, and is not listed in part 261, subpart D, and does not exhibit a characteristic identified in part 261, subpart C.

“Non-pharmaceutical hazardous waste” means a solid waste, as defined in Section 261.2, that is listed in part 261, subpart D, or exhibits one or more characteristics identified in part 261, subpart C, but is not a pharmaceutical, as defined in this Section.

“Pharmaceutical” means any drug or dietary supplement for use by humans or other animals; any electronic nicotine delivery system (e.g., electronic cigarette or vaping pen); or any liquid nicotine (e-liquid) packaged for retail sale for use in electronic nicotine delivery systems (e.g., pre-filled cartridges or vials). This definition includes, but is not limited to, dietary supplements, as defined by the Federal Food, Drug and Cosmetic Act; prescription drugs, as defined by 21 CFR 203.3(y); over-the-counter drugs; homeopathic drugs; compounded drugs; investigational new drugs; pharmaceuticals remaining in non-empty containers; personal protective equipment contaminated with pharmaceuticals; and clean-up material from spills of pharmaceuticals. This definition does not include dental amalgam or sharps.

“Potentially creditable hazardous waste pharmaceutical” means a prescription hazardous waste pharmaceutical that has a reasonable expectation to receive manufacturer credit and is-

- (1) in original manufacturer packaging (except pharmaceuticals that were subject to a recall);
- (2) undispensed; and
- (3) unexpired or less than one year past expiration date.

The term does not include evaluated hazardous waste pharmaceuticals or nonprescription pharmaceuticals including, but not limited to, over-the-counter drugs, homeopathic drugs, and dietary supplements.

“Reverse distributor” means any person that receives and accumulates prescription pharmaceuticals that are potentially creditable hazardous waste pharmaceuticals for the purpose of facilitating or verifying manufacturer credit. Any person, including forward distributors, third-party logistics providers, and pharmaceutical manufacturers, that processes prescription pharmaceuticals for the facilitation or verification of manufacturer credit is considered a reverse distributor.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.501. Applicability.

(a) A healthcare facility that is a very small quantity generator when counting all of its hazardous waste, including both its hazardous waste pharmaceuticals and its non-pharmaceutical hazardous waste, remains subject to Section 262.14 and is not subject to this subpart, except for Sections 266.505 and 266.507 and the optional provisions of Section 266.504.

(b) A healthcare facility that is a very small quantity generator when counting all of its hazardous waste, including both its hazardous waste pharmaceuticals and its non-pharmaceutical hazardous waste, has the option of complying with Section 266.501(d) for the management of its hazardous waste pharmaceuticals as an alternative to complying with Section 262.14 and the optional provisions of Section 266.504.

(c) A healthcare facility or reverse distributor remains subject to all applicable hazardous waste regulations with respect to the management of its non-pharmaceutical hazardous waste.

(d) With the exception of healthcare facilities identified in subsection (a), a healthcare facility is subject to the following in lieu of parts 262—265:

- (1) Sections 266.502 and 266.505 through 266.508 of this subpart with respect to the management of:
 - (i) Non-creditable hazardous waste pharmaceuticals, and
 - (ii) Potentially creditable hazardous waste pharmaceuticals if they are not destined for a reverse distributor.

(2) Sections 262.502(a), 266.503, 266.505 through 266.507, and 266.509 of this subpart with respect to the management of potentially creditable hazardous waste pharmaceuticals that are prescription pharmaceuticals and are destined for a reverse distributor.

(e) A reverse distributor is subject to Sections 266.505 through 266.510 of this subpart in lieu of parts 262 through 265 with respect to the management of hazardous waste pharmaceuticals.

(f) Hazardous waste pharmaceuticals generated or managed by entities other than healthcare facilities and reverse distributors (e.g., pharmaceutical manufacturers and reverse logistics centers) are not subject to this subpart. Other generators are subject to 40 CFR part 262 for the generation and accumulation of hazardous wastes, including hazardous waste pharmaceuticals.

(g) The following are not subject to parts 260 through 273, except as specified:

(1) Pharmaceuticals that are not solid waste, as defined by Section 261.2, because they are legitimately used/re-used (e.g., lawfully donated for their intended purpose) or reclaimed.

(2) Over-the-counter pharmaceuticals, dietary supplements, or homeopathic drugs that are not solid wastes, as defined by Section 261.2, because they have a reasonable expectation of being legitimately used/re-used (e.g., lawfully redistributed for their intended purpose) or reclaimed.

(3) Pharmaceuticals being managed in accordance with a recall strategy that has been approved by the Food and Drug Administration in accordance with 21 CFR part 7, subpart C. This subpart does apply to the management of the recalled hazardous waste pharmaceuticals after the Food and Drug Administration approves the destruction of the recalled items.

(4) Pharmaceuticals being managed in accordance with a recall corrective action plan that has been accepted by the Consumer Product Safety Commission in accordance with 16 CFR part 1115. This subpart does apply to the management of the recalled hazardous waste pharmaceuticals after the Consumer Product Safety Commission approves the destruction of the recalled items.

(5) Pharmaceuticals stored according to a preservation order, or during an investigation or judicial proceeding until after the preservation order, investigation, or judicial proceeding has concluded and/or a decision is made to discard the pharmaceuticals.

(6) Investigational new drugs for which an investigational new drug application is in effect in accordance with the Food and Drug Administration's regulations in 21 CFR part 312. This subpart does apply to the management of the investigational new drug after the decision is made to discard the investigational new drug or the Food and Drug Administration approves the destruction of the investigational new drug, if the investigational new drug is a hazardous waste.

(7) Household waste pharmaceuticals, including those that have been collected by an authorized collector (as defined by the Drug Enforcement Administration), provided the authorized collector complies with the conditional exemption in Sections 266.506(a)(2) and 266.506(b).

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.502. Standards for healthcare facilities managing non-creditable hazardous waste pharmaceuticals.

(a) Notification and withdrawal from this subpart for healthcare facilities managing hazardous waste pharmaceuticals—

(1) Notification. A healthcare facility must notify the Department, using the Site Identification Form (EPA Form 8700–12), that it is a healthcare facility operating under this subpart. A healthcare facility is not required to fill out Box 10.B. (Waste Codes for Federally Regulated Hazardous Waste) of the Site Identification Form with respect to its hazardous waste pharmaceuticals. A healthcare facility must submit a separate notification (Site Identification Form) for each site or EPA identification number.

(i) A healthcare facility that already has an EPA identification number must notify the Department using the Site Identification Form (EPA Form 8700–12) that it is a healthcare facility. A large quantity generator must notify the Department in its next quarterly report per Section 262.41. A small quantity generator must notify the Department in its annual declaration per Section 262.44.

(ii) A healthcare facility that does not have an EPA identification number must obtain one by notifying the Department using the Site Identification Form (EPA Form 8700–12) that it is a

healthcare facility within thirty (30) calendar days of the effective date of this subpart or within thirty (30) calendar days of becoming subject to this subpart.

(iii) A healthcare facility must keep a copy of its notification on file for as long as the healthcare facility is subject to this subpart.

(2) Withdrawal. A healthcare facility that operated under this subpart but is no longer subject to this subpart, because it is a very small quantity generator under Section 262.14, and elects to withdraw from this subpart, must notify the Department using the Site Identification Form (EPA Form 8700-12) that it is no longer operating under this subpart. A healthcare facility is not required to fill out Box 10.B. (Waste Codes for Federally Regulated Hazardous Waste) of the Site Identification Form with respect to its hazardous waste pharmaceuticals.

A healthcare facility must submit a separate notification (Site Identification Form) for each EPA identification number.

(i) A healthcare facility must submit the Site Identification Form notifying that it is withdrawing from this subpart before it begins operating under the conditional exemption of Section 262.14.

(ii) A healthcare facility must keep a copy of its withdrawal on file for three years from the date of signature on the notification of its withdrawal.

(b) Training of personnel managing non-creditable hazardous waste pharmaceuticals at healthcare facilities. A healthcare facility must ensure that all personnel that manage non-creditable hazardous waste pharmaceuticals are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies.

(c) Hazardous waste determination for non-creditable pharmaceuticals. A healthcare facility that generates a solid waste that is a non-creditable pharmaceutical must determine whether that pharmaceutical is a hazardous waste pharmaceutical (i.e., it exhibits a characteristic identified in part 261, subpart C or is listed in part 261, subpart D) in order to determine whether the waste is subject to this subpart. A healthcare facility may choose to manage its non-hazardous waste pharmaceuticals as non-creditable hazardous waste pharmaceuticals under this subpart.

(d) Standards for containers used to accumulate non-creditable hazardous waste pharmaceuticals at healthcare facilities.

(1) A healthcare facility must place non-creditable hazardous waste pharmaceuticals in a container that is structurally sound, compatible with its contents, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

(2) A healthcare facility that manages ignitable or reactive non-creditable hazardous waste pharmaceuticals, or that mixes or commingles incompatible non-creditable hazardous waste pharmaceuticals must manage the container so that it does not have the potential to:

(i) Generate extreme heat or pressure, fire or explosion, or violent reaction;

(ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;

(iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(iv) Damage the structural integrity of the container of non-creditable hazardous waste pharmaceuticals; or

(v) Through other like means threaten human health or the environment.

(3) A healthcare facility must keep containers of non-creditable hazardous waste pharmaceuticals closed and secured in a manner that prevents unauthorized access to its contents.

(4) A healthcare facility may accumulate non-creditable hazardous waste pharmaceuticals and non-hazardous non-creditable waste pharmaceuticals in the same container, except that non-creditable hazardous waste pharmaceuticals prohibited from being combusted because of the dilution prohibition of Section 268.3(c) must be accumulated in separate containers and labeled with all applicable hazardous waste numbers (i.e., hazardous waste codes).

(e) Labeling containers used to accumulate non-creditable hazardous waste pharmaceuticals at healthcare facilities. A healthcare facility must label or clearly mark each container of non-creditable hazardous waste pharmaceuticals with the phrase “Hazardous Waste Pharmaceuticals.”

(f) Maximum accumulation time for non-creditable hazardous waste pharmaceuticals at healthcare facilities.

(1) A healthcare facility may accumulate non-creditable hazardous waste pharmaceuticals on-site for one (1) year or less without a permit or having interim status.

(2) A healthcare facility that accumulates non-creditable hazardous waste pharmaceuticals on-site must demonstrate the length of time that the non-creditable hazardous waste pharmaceuticals have been accumulating, starting from the date it first becomes a waste. A healthcare facility may make this demonstration by any of the following methods:

(i) Marking or labeling the container of non-creditable hazardous waste pharmaceuticals with the date that the non-creditable hazardous waste pharmaceuticals became a waste;

(ii) Maintaining an inventory system that identifies the date the non-creditable hazardous waste pharmaceuticals being accumulated first became a waste; or

(iii) Placing the non-creditable hazardous waste pharmaceuticals in a specific area and identifying the earliest date that any of the non-creditable hazardous waste pharmaceuticals in the area became a waste.

(g) Land disposal restrictions for non-creditable hazardous waste pharmaceuticals. The non-creditable hazardous waste pharmaceuticals generated by a healthcare facility are subject to the land disposal restrictions of part 268. A healthcare facility that generates non-creditable hazardous waste pharmaceuticals must comply with the land disposal restrictions in accordance with Section 268.7(a) requirements, except that it is not required to identify the hazardous waste numbers (i.e., hazardous waste codes) on the land disposal restrictions notification.

(h) Procedures for healthcare facilities for managing rejected shipments of non-creditable hazardous waste pharmaceuticals. A healthcare facility that sends a shipment of non-creditable hazardous waste pharmaceuticals to a designated facility with the understanding that the designated facility can accept and manage the waste, and later receives that shipment back as a rejected load in accordance with the manifest discrepancy provisions of Section 264.72 or Section 265.72 of this chapter may accumulate the returned non-creditable hazardous waste pharmaceuticals on-site for up to an additional ninety (90) calendar days provided the rejected or returned shipment is managed in accordance with paragraphs (d) and (e) of this section. Upon receipt of the returned shipment, the healthcare facility must:

(1) Sign either:

(i) Item 18c of the original manifest, if the original manifest was used for the returned shipment; or

(ii) Item 20 of the new manifest, if a new manifest was used for the returned shipment;

(2) Provide the transporter a copy of the manifest;

(3) Within thirty (30) calendar days of receipt of the rejected shipment, send a copy of the manifest to the designated facility that returned the shipment to the healthcare facility; and

(4) Within ninety (90) calendar days of receipt of the rejected shipment, transport or offer for transport the returned shipment in accordance with the shipping standards of Section 266.508(a).

(i) Reporting by healthcare facilities for non-creditable hazardous waste pharmaceuticals.

(1) Reporting by healthcare facilities. Healthcare facilities are not subject to reporting requirements under Section 262.41 or Section 262.44 with respect to non-creditable hazardous waste pharmaceuticals managed under this subpart.

(2) Exception reporting by healthcare facilities for a missing copy of the manifest.

(i) For shipments from a healthcare facility to a designated facility:

(A) If a healthcare facility does not receive a copy of the manifest with the signature of the owner or operator of the designated facility within sixty (60) days of the date the non-

creditable hazardous waste pharmaceuticals were accepted by the initial transporter, the healthcare facility must submit:

(1) A legible copy of the original manifest, indicating that the healthcare facility has not received confirmation of delivery, to the Department for the Region in which the healthcare facility is located, and

(2) A handwritten or typed note on the manifest itself, or on an attached sheet of paper, stating that the return copy was not received and explaining the efforts taken to locate the non-creditable hazardous waste pharmaceuticals and the results of those efforts.

(B) [Reserved]

(ii) For shipments rejected by the designated facility and shipped to an alternate facility.

(A) If a healthcare facility does not receive a copy of the manifest for a rejected shipment of the non-creditable hazardous waste pharmaceuticals that is forwarded by the designated facility to an alternate facility (using appropriate manifest procedures), with the signature of the owner or operator of the alternate facility, within sixty (60) days of the date the non-creditable hazardous waste was accepted by the initial transporter forwarding the shipment of non-creditable hazardous waste pharmaceuticals from the designated facility to the alternate facility, the healthcare facility must submit:

(1) A legible copy of the original manifest, indicating that the healthcare facility has not received confirmation of delivery, to the Department for the state in which the healthcare facility is located; and

(2) A handwritten or typed note on the manifest itself, or on an attached sheet of paper, stating that the return copy was not received and explaining the efforts taken to locate the non-creditable hazardous waste pharmaceuticals and the results of those efforts.

(B) [Reserved]

(3) Additional reports. The Department may require healthcare facilities to furnish additional reports concerning the quantities and disposition of non-creditable hazardous waste pharmaceuticals.

(j) Recordkeeping by healthcare facilities for non-creditable hazardous waste pharmaceuticals.

(1) A healthcare facility must keep a copy of each manifest signed in accordance with Section 262.23(a) for three (3) years or until it receives a signed copy from the designated facility that received the non-creditable hazardous waste pharmaceuticals. This signed copy must be retained as a record for at least three (3) years from the date the waste was accepted by the initial transporter.

(2) A healthcare facility must keep a copy of each exception report for a period of at least three (3) years from the date of the report.

(3) A healthcare facility must keep records of any test results, waste analyses, or other determinations made to support its hazardous waste determination(s) consistent with Section 262.11(f), for at least three (3) years from the date the waste was last sent to on-site or off-site treatment, storage, or disposal. A healthcare facility that manages all of its non-creditable non-hazardous waste pharmaceuticals as non-creditable hazardous waste pharmaceuticals is not required to keep documentation of hazardous waste determinations.

(4) The periods of retention referred to in this section are extended automatically during the course of any unresolved enforcement action regarding the regulated activity, or as requested by the Department.

(5) All records must be readily available upon request by an inspector.

(k) Response to spills of non-creditable hazardous waste pharmaceuticals at healthcare facilities. A healthcare facility must immediately contain all spills of non-creditable hazardous waste pharmaceuticals and manage the spill clean-up materials as non-creditable hazardous waste pharmaceuticals in accordance with the requirements of this subpart.

(l) Accepting non-creditable hazardous waste pharmaceuticals from an off-site healthcare facility that is a very small quantity generator. A healthcare facility may accept non-creditable hazardous waste pharmaceuticals from an off-site healthcare facility that is a very small quantity generator

under Section 262.14, without a permit or without having interim status, provided the receiving healthcare facility:

(1) Is under the control of the same person (as defined in Section 260.10) as the very small quantity generator healthcare facility that is sending the non-creditable hazardous waste pharmaceuticals off-site (“control,” for the purposes of this section, means the power to direct the policies of the healthcare facility, whether by the ownership of stock, voting rights, or otherwise, except that contractors who operate healthcare facilities on behalf of a different person as defined in Section 260.10 of this chapter shall not be deemed to “control” such healthcare facilities) or has a contractual or other documented business relationship whereby the receiving healthcare facility supplies pharmaceuticals to the very small quantity generator healthcare facility;

(2) Is operating under this subpart for the management of its non-creditable hazardous waste pharmaceuticals;

(3) Manages the non-creditable hazardous waste pharmaceuticals that it receives from off site in compliance with this subpart; and

(4) Keeps records of the non-creditable hazardous waste pharmaceuticals shipments it receives from off site for three years from the date that the shipment is received.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.503. Standards for healthcare facilities managing potentially creditable hazardous waste pharmaceuticals.

(a) Hazardous waste determination for potentially creditable pharmaceuticals. A healthcare facility that generates a solid waste that is a potentially creditable pharmaceutical must determine whether the potentially creditable pharmaceutical is a potentially creditable hazardous waste pharmaceutical (i.e., it is listed in part 261, subpart D or exhibits a characteristic identified in part 261, subpart C). A healthcare facility may choose to manage its potentially creditable non-hazardous waste pharmaceuticals as potentially creditable hazardous waste pharmaceuticals under this subpart.

(b) Accepting potentially creditable hazardous waste pharmaceuticals from an off-site healthcare facility that is a very small quantity generator. A healthcare facility may accept potentially creditable hazardous waste pharmaceuticals from an off-site healthcare facility that is a very small quantity generator under Section 262.14, without a permit or without having interim status, provided the receiving healthcare facility:

(1) Is under the control of the same person, as defined in Section 260.10, as the very small quantity generator healthcare facility that is sending the potentially creditable hazardous waste pharmaceuticals off site, or has a contractual or other documented business relationship whereby the receiving healthcare facility supplies pharmaceuticals to the very small quantity generator healthcare facility;

(2) Is operating under this subpart for the management of its potentially creditable hazardous waste pharmaceuticals;

(3) Manages the potentially creditable hazardous waste pharmaceuticals that it receives from off site in compliance with this subpart; and

(4) Keeps records of the potentially creditable hazardous waste pharmaceuticals shipments it receives from off site for three (3) years from the date that the shipment is received.

(c) Prohibition. Healthcare facilities are prohibited from sending hazardous wastes other than potentially creditable hazardous waste pharmaceuticals to a reverse distributor.

(d) Reporting by healthcare facilities. Healthcare facilities are not subject to reporting requirements under Section 262.41 or Section 262.44 with respect to potentially creditable hazardous waste pharmaceuticals managed under this subpart.

(e) Recordkeeping by healthcare facilities.

(1) A healthcare facility that initiates a shipment of potentially creditable hazardous waste pharmaceuticals to a reverse distributor must keep the following records (paper or electronic) for each shipment of potentially creditable hazardous waste pharmaceuticals for three (3) years from the date of shipment:

- (i) The confirmation of delivery; and
 - (ii) The shipping papers prepared in accordance with 49 CFR part 172, subpart C, if applicable.
- (2) The periods of retention referred to in this section are extended automatically during the course of any unresolved enforcement action regarding the regulated activity, or as requested by the Department.
- (3) All records must be readily available upon request by an inspector.
- (f) Response to spills of potentially creditable hazardous waste pharmaceuticals at healthcare facilities. A healthcare facility must immediately contain all spills of potentially creditable hazardous waste pharmaceuticals and manage the spill clean-up materials as non-creditable hazardous waste pharmaceuticals in accordance with this subpart.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.504. Healthcare facilities that are very small quantity generators for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste.

- (a) Potentially creditable hazardous waste pharmaceuticals. A healthcare facility that is a very small quantity generator for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste may send its potentially creditable hazardous waste pharmaceuticals to a reverse distributor.
- (b) Off-site collection of hazardous waste pharmaceuticals generated by a healthcare facility that is a very small quantity generator. A healthcare facility that is a very small quantity generator for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste may send its hazardous waste pharmaceuticals off-site to another healthcare facility, provided:
- (1) The receiving healthcare facility meets the conditions in Section 266.502(*l*) of this subpart and Section 266.503(b), as applicable; or
 - (2) The very small quantity generator healthcare facility meets the conditions in section 262.14(a)(5)(viii) and the receiving large quantity generator meets the conditions in Section 262.17(f).
- (c) Long-term care facilities that are very small quantity generators. A long-term care facility that is a very small quantity generator for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste may dispose of its hazardous waste pharmaceuticals (excluding contaminated personal protective equipment or clean-up materials) in an on-site collection receptacle of an authorized collector (as defined by the Drug Enforcement Administration) that is registered with the Drug Enforcement Administration provided the contents are collected, stored, transported, destroyed, and disposed of in compliance with all applicable Drug Enforcement Administration regulations for controlled substances.
- (d) Long-term care facilities with twenty (20) beds or fewer. A long-term care facility with twenty (20) beds or fewer is presumed to be a very small quantity generator subject to Section 262.14 for both hazardous waste pharmaceuticals and non-pharmaceutical hazardous waste and not subject to this subpart, except for Sections 266.505 and 266.507 and the other optional provisions of this section. The Department has the responsibility to demonstrate that a long-term care facility with twenty (20) beds or fewer generates quantities of hazardous waste that are in excess of the very small quantity generator limits as defined in Section 260.10. A long-term care facility with more than twenty (20) beds that operates as a very small quantity generator under Section 262.14 must demonstrate that it generates quantities of hazardous waste that are within the very small quantity generator limits as defined by Section 260.10.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.505. Prohibition of sewerage hazardous waste pharmaceuticals.

All healthcare facilities—including very small quantity generators operating under section 262.14 in lieu of this subpart—and reverse distributors are prohibited from discharging hazardous waste pharmaceuticals to a sewer system that passes through to a publicly owned treatment works. Healthcare facilities and reverse distributors remain subject to the prohibitions in R.61–9.403.5(b)(1).

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.506. Conditional exemptions for hazardous waste pharmaceuticals that are also controlled substances and household waste pharmaceuticals collected in a take-back event or program.

(a) Conditional exemptions. Provided the conditions of paragraph (b) of this section are met, the following are exempt from parts 262 through 273:

(1) Hazardous waste pharmaceuticals that are also listed on a schedule of controlled substances by the Drug Enforcement Administration in 21 CFR part 1308, and

(2) Household waste pharmaceuticals that are collected in a take-back event or program, including those that are collected by an authorized collector (as defined by the Drug Enforcement Administration) registered with the Drug Enforcement Administration that commingles the household waste pharmaceuticals with controlled substances from an ultimate user (as defined by the Drug Enforcement Administration).

(b) Conditions for exemption. The hazardous waste pharmaceuticals must be:

(1) Managed in compliance with the sewer prohibition of Section 266.505;

(2) Collected, stored, transported, and disposed of in compliance with all applicable Drug Enforcement Administration regulations for controlled substances; and

(3) Destroyed by a method that the Drug Enforcement Administration has publicly deemed in writing to meet their non-retrievable standard of destruction or combusted at one of the following:

(i) A permitted large municipal waste combustor, subject to 40 CFR part 62, subpart FFF or applicable state plan for existing large municipal waste combustors, or 40 CFR part 60, subpart Eb for new large municipal waste combustors; or

(ii) A permitted small municipal waste combustor, subject to 40 CFR part 62, subpart JJJ or applicable state plan for existing small municipal waste combustors, or 40 CFR part 60, subpart AAAA for new small municipal waste combustors; or

(iii) A permitted hospital, medical and infectious waste incinerator, subject to 40 CFR part 62, subpart HHH or applicable state plan for existing hospital, medical and infectious waste incinerators, or 40 CFR part 60, subpart Ec for new hospital, medical and infectious waste incinerators.

(iv) A permitted commercial and industrial solid waste incinerator, subject to 40 CFR part 62, subpart III or applicable state plan for existing commercial and industrial solid waste incinerators, or 40 CFR part 60, subpart CCCC for new commercial and industrial solid waste incinerators.

(v) A permitted hazardous waste combustor subject to 40 CFR part 63, subpart EEE.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.507. Residues of hazardous waste pharmaceuticals in empty containers.

(a) Stock, dispensing, and unit-dose containers. A stock bottle, dispensing bottle, vial, or ampule (not to exceed 1 liter or 10,000 pills); or a unit-dose container (e.g., a unit-dose packet, cup, wrapper, blister pack, or delivery device) is considered empty and the residues are not regulated as hazardous waste provided the pharmaceuticals have been removed from the stock bottle, dispensing bottle, vial, ampule, or the unit-dose container using the practices commonly employed to remove materials from that type of container.

(b) Syringes. A syringe is considered empty and the residues are not regulated as hazardous waste under this subpart provided the contents have been removed by fully depressing the plunger of the syringe. If a syringe is not empty, the syringe must be placed with its remaining hazardous waste pharmaceuticals into a container that is managed and disposed of as a non-creditable hazardous waste pharmaceutical under this subpart and any applicable federal, state, and local requirements for sharps containers and medical waste.

(c) Intravenous (IV) bags. An intravenous (IV) bag is considered empty and the residues are not regulated as hazardous waste provided the pharmaceuticals in the intravenous (IV) bag have been fully administered to a patient. If an intravenous (IV) bag is not empty, the intravenous (IV) bag must be placed with its remaining hazardous waste pharmaceuticals into a container that is managed

and disposed of as a non-creditable hazardous waste pharmaceutical under this subpart, unless the intravenous (IV) bag held non-acute hazardous waste pharmaceuticals and is empty as defined in Section 261.7(b)(1).

(d) Other containers, including delivery devices. Hazardous waste pharmaceuticals remaining in all other types of unused, partially administered, or fully administered containers must be managed as non-creditable hazardous waste pharmaceuticals under this subpart, unless the container held non-acute hazardous waste pharmaceuticals and is empty as defined in Section 261.7(b)(1) or (2). This includes, but is not limited to, residues in inhalers, aerosol cans, nebulizers, tubes of ointments, gels, or creams.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.508. Shipping non-creditable hazardous waste pharmaceuticals from a healthcare facility or evaluated hazardous waste pharmaceuticals from a reverse distributor.

(a) Shipping non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals. A healthcare facility must ship non-creditable hazardous waste pharmaceuticals and a reverse distributor must ship evaluated hazardous waste pharmaceuticals off-site to a designated facility (such as a permitted or interim status treatment, storage, or disposal facility) in compliance with:

(1) The following pre-transport requirements, before transporting or offering for transport off-site:

(i) Packaging. Package the waste in accordance with the applicable U.S. Department of Transportation regulations on hazardous materials under 49 CFR parts 173, 178, and 180.

(ii) Labeling. Label each package in accordance with the applicable U.S. Department of Transportation regulations on hazardous materials under 49 CFR part 172, subpart E.

(iii) Marking.

(A) Mark each package of hazardous waste pharmaceuticals in accordance with the applicable U.S. Department of Transportation regulations on hazardous materials under 49 CFR part 172, subpart D;

(B) Mark each container of 119 gallons or less used in such transportation with the following words and information in accordance with the requirements of 49 CFR 172.304:

“HAZARDOUS WASTE—Federal Law Prohibits Improper Disposal. If found, contact the nearest police or public safety authority or the U.S. Environmental Protection Agency.

Healthcare Facility’s or Reverse distributor’s Name and Address _____

Healthcare Facility’s or Reverse distributor’s EPA Identification Number _____

Manifest Tracking Number _____.”

(C) Lab packs that will be incinerated in compliance with Section 268.42(c) are not required to be marked with EPA Hazardous Waste Number(s), except D004, D005, D006, D007, D008, D010, and D011, where applicable. A nationally recognized electronic system, such as bar coding or radio frequency identification, may be used to identify the EPA Hazardous Waste Number(s).

(iv) Placarding. Placard or offer the initial transporter the appropriate placards according to U.S. Department of Transportation regulations for hazardous materials under 49 CFR part 172, subpart F.

(2) The manifest requirements of part 262, subpart B, except that:

(i) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals is not required to list all applicable hazardous waste numbers (i.e., hazardous waste codes) in Item 13 of EPA Form 8700–22.

(ii) A healthcare facility shipping non-creditable hazardous waste pharmaceuticals must write the word “PHARMS” in Item 13 of EPA Form 8700–22.

(b) Exporting non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals. A healthcare facility or reverse distributor that exports non-creditable hazardous

waste pharmaceuticals or evaluated hazardous waste pharmaceuticals is subject to part 262, subpart H.

(c) Importing non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals. Any person that imports non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals is subject to part 262, subpart H. A healthcare facility or reverse distributor may not accept imported non-creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals unless they have a permit or interim status that allows them to accept hazardous waste from off site.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.509. Shipping potentially creditable hazardous waste pharmaceuticals from a health-care facility or a reverse distributor to a reverse distributor.

(a) Shipping potentially creditable hazardous waste pharmaceuticals. A healthcare facility or a reverse distributor who transports or offers for transport potentially creditable hazardous waste pharmaceuticals off-site to a reverse distributor must comply with all applicable U.S. Department of Transportation regulations in 49 CFR part 171 through 180 for any potentially creditable hazardous waste pharmaceutical that meets the definition of hazardous material in 49 CFR 171.8. For purposes of the U.S. Department of Transportation regulations, a material is considered a hazardous waste if it is subject to the Hazardous Waste Manifest Requirements of the U.S. Environmental Protection Agency specified in 40 CFR part 262. Because a potentially creditable hazardous waste pharmaceutical does not require a manifest, it is not considered hazardous waste under the U.S. Department of Transportation regulations.

(b) Delivery confirmation. Upon receipt of each shipment of potentially creditable hazardous waste pharmaceuticals, the receiving reverse distributor must provide confirmation (paper or electronic) to the healthcare facility or reverse distributor that initiated the shipment that the shipment of potentially creditable hazardous waste pharmaceuticals has arrived at its destination and is under the custody and control of the reverse distributor.

(c) Procedures for when delivery confirmation is not received within thirty-five (35) calendar days. If a healthcare facility or reverse distributor initiates a shipment of potentially creditable hazardous waste pharmaceuticals to a reverse distributor and does not receive delivery confirmation within thirty-five (35) calendar days from the date that the shipment of potentially creditable hazardous waste pharmaceuticals was sent, the healthcare facility or reverse distributor that initiated the shipment must contact the carrier and the intended recipient (i.e., the reverse distributor) promptly to report that the delivery confirmation was not received and to determine the status of the potentially creditable hazardous waste pharmaceuticals.

(d) Exporting potentially creditable hazardous waste pharmaceuticals. A healthcare facility or reverse distributor that sends potentially creditable hazardous waste pharmaceuticals to a foreign destination must comply with the applicable sections of part 262, subpart H, except the manifesting requirement of Section 262.83(c), in addition to paragraphs (a) through (c) of this section.

(e) Importing potentially creditable hazardous waste pharmaceuticals. Any person that imports potentially creditable hazardous waste pharmaceuticals into the United States is subject to paragraphs (a) through (c) of this section in lieu of part 262, subpart H. Immediately after the potentially creditable hazardous waste pharmaceuticals enter the United States, they are subject to all applicable requirements of this subpart.

HISTORY: Added by SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

266.510. Standards for the management of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals at reverse distributors.

A reverse distributor may accept potentially creditable hazardous waste pharmaceuticals from off site and accumulate potentially creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals on-site without a hazardous waste permit or without having interim status, provided that it complies with the following conditions:

(a) Standards for reverse distributors managing potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals—

(1) Notification. A reverse distributor must notify the Department, using the Site Identification Form (EPA Form 8700-12), that it is a reverse distributor operating under this subpart.

(i) A reverse distributor that already has an EPA identification number must notify the Department, using the Site Identification Form (EPA Form 8700-12), that it is a reverse distributor, as defined in section 266.500, within 60 days of the effective date of this subpart, or within 60 days of becoming subject to this subpart.

(ii) A reverse distributor that does not have an EPA identification number must obtain one by notifying the Department, using the Site Identification Form (EPA Form 8700-12), that it is a reverse distributor, as defined in Section 266.500, within sixty (60) calendar days of the effective date of this subpart, or within sixty (60) calendar days of becoming subject to this subpart.

(2) Inventory by the reverse distributor. A reverse distributor must maintain a current inventory of all the potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals that are accumulated on-site.

(i) A reverse distributor must inventory each potentially creditable hazardous waste pharmaceutical within thirty (30) calendar days of each waste arriving at the reverse distributor.

(ii) The inventory must include the identity (e.g., name or national drug code) and quantity of each potentially creditable hazardous waste pharmaceutical and evaluated hazardous waste pharmaceutical.

(iii) If the reverse distributor already meets the inventory requirements of this paragraph because of other regulatory requirements, such as State Board of Pharmacy regulations, the facility is not required to provide a separate inventory pursuant to this section.

(3) Evaluation by a reverse distributor that is not a manufacturer. A reverse distributor that is not a pharmaceutical manufacturer must evaluate a potentially creditable hazardous waste pharmaceutical within thirty (30) calendar days of the waste arriving at the reverse distributor to establish whether it is destined for another reverse distributor for further evaluation or verification of manufacturer credit or for a permitted or interim status treatment, storage, or disposal facility.

(i) A potentially creditable hazardous waste pharmaceutical that is destined for another reverse distributor is still considered a “potentially creditable hazardous waste pharmaceutical” and must be managed in accordance with paragraph (b) of this section.

(ii) A potentially creditable hazardous waste pharmaceutical that is destined for a permitted or interim status treatment, storage, or disposal facility is considered an “evaluated hazardous waste pharmaceutical” and must be managed in accordance with paragraph (c) of this section.

(4) Evaluation by a reverse distributor that is a manufacturer. A reverse distributor that is a pharmaceutical manufacturer must evaluate a potentially creditable hazardous waste pharmaceutical to verify manufacturer credit within thirty (30) calendar days of the waste arriving at the facility and following the evaluation must manage the evaluated hazardous waste pharmaceuticals in accordance with paragraph (c) of this section.

(5) Maximum accumulation time for hazardous waste pharmaceuticals at a reverse distributor.

(i) A reverse distributor may accumulate potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals on-site for one hundred eighty (180) calendar days or less. The one hundred eighty (180) days start after the potentially creditable hazardous waste pharmaceutical has been evaluated and applies to all hazardous waste pharmaceuticals accumulated on-site, regardless of whether they are destined for another reverse distributor (i.e., potentially creditable hazardous waste pharmaceuticals) or a permitted or interim status treatment, storage, or disposal facility (i.e., evaluated hazardous waste pharmaceuticals).

(ii) Aging pharmaceuticals. Unexpired pharmaceuticals that are otherwise creditable but are awaiting their expiration date (i.e., aging in a holding morgue) can be accumulated for up to 180 days after the expiration date, provided that the unexpired pharmaceuticals are managed in accordance with paragraph (a) of this section and the container labeling and management standards in Section 266.510(c)(4)(i)-(vi).

(6) Security at the reverse distributor facility. A reverse distributor must prevent unknowing entry and minimize the possibility for the unauthorized entry into the portion of the facility where

potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals are kept.

(i) Examples of methods that may be used to prevent unknowing entry and minimize the possibility for unauthorized entry include, but are not limited to:

- (A) A 24-hour continuous monitoring surveillance system;
- (B) An artificial barrier such as a fence; or
- (C) A means to control entry, such as keycard access.

(ii) If the reverse distributor already meets the security requirements of this paragraph because of other regulatory requirements, such as Drug Enforcement Administration or State Board of Pharmacy regulations, the facility is not required to provide separate security measures pursuant to this section.

(7) Contingency plan and emergency procedures at a reverse distributor. A reverse distributor that accepts potentially creditable hazardous waste pharmaceuticals from off-site must prepare a contingency plan and comply with the other requirements of part 262, subpart M.

(8) Closure of a reverse distributor. When closing an area where a reverse distributor accumulates potentially creditable hazardous waste pharmaceuticals or evaluated hazardous waste pharmaceuticals, the reverse distributor must comply with Section 262.17(a)(8)(ii) and (iii).

(9) Reporting by a reverse distributor.

(i) Unauthorized waste report. A reverse distributor must submit an unauthorized waste report if the reverse distributor receives waste from off site that it is not authorized to receive (e.g., non-pharmaceutical hazardous waste, regulated medical waste). The reverse distributor must prepare and submit an unauthorized waste report to the Department within forty-five (45) calendar days after the unauthorized waste arrives at the reverse distributor and must send a copy of the unauthorized waste report to the healthcare facility (or other entity) that sent the unauthorized waste. The reverse distributor must manage the unauthorized waste in accordance with all applicable regulations. The unauthorized waste report must be signed by the owner or operator of the reverse distributor, or its authorized representative, and contain the following information:

- (A) The EPA identification number, name and address of the reverse distributor;
- (B) The date the reverse distributor received the unauthorized waste;
- (C) The EPA identification number, name, and address of the healthcare facility that shipped the unauthorized waste, if available;
- (D) A description and the quantity of each unauthorized waste the reverse distributor received;
- (E) The method of treatment, storage, or disposal for each unauthorized waste; and
- (F) A brief explanation of why the waste was unauthorized, if known.

(ii) Additional reports. The Department may require reverse distributors to furnish additional reports concerning the quantities and disposition of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals.

(10) Recordkeeping by reverse distributors. A reverse distributor must keep the following records (paper or electronic) readily available upon request by an inspector. The periods of retention referred to in this section are extended automatically during the course of any unresolved enforcement action regarding the regulated activity, or as requested by the Department.

(i) A copy of its notification on file for as long as the facility is subject to this subpart;

(ii) A copy of the delivery confirmation and the shipping papers for each shipment of potentially creditable hazardous waste pharmaceuticals that it receives, and a copy of each unauthorized waste report, for at least three (3) years from the date the shipment arrives at the reverse distributor;

(iii) A copy of its current inventory for as long as the facility is subject to this subpart.

(b) Additional standards for reverse distributors managing potentially creditable hazardous waste pharmaceuticals destined for another reverse distributor. A reverse distributor that does not have a permit or interim status must comply with the following conditions, in addition to the requirements in paragraph (a) of this section, for the management of potentially creditable hazardous waste pharmaceuticals that are destined for another reverse distributor for further evaluation or verification of manufacturer credit:

(1) A reverse distributor that receives potentially creditable hazardous waste pharmaceuticals from a healthcare facility must send those potentially creditable hazardous waste pharmaceuticals to another reverse distributor within one hundred eighty (180) calendar days after the potentially creditable hazardous waste pharmaceuticals have been evaluated or follow paragraph (c) of this section for evaluated hazardous waste pharmaceuticals.

(2) A reverse distributor that receives potentially creditable hazardous waste pharmaceuticals from another reverse distributor must send those potentially creditable hazardous waste pharmaceuticals to a reverse distributor that is a pharmaceutical manufacturer within one hundred eighty (180) calendar days after the potentially creditable hazardous waste pharmaceuticals have been evaluated or follow paragraph (c) of this section for evaluated hazardous waste pharmaceuticals.

(3) A reverse distributor must ship potentially creditable hazardous waste pharmaceuticals destined for another reverse distributor in accordance with Section 266.509.

(4) Recordkeeping by reverse distributors. A reverse distributor must keep the following records (paper or electronic) readily available upon request by an inspector for each shipment of potentially creditable hazardous waste pharmaceuticals that it initiates to another reverse distributor, for at least three (3) years from the date of shipment. The periods of retention referred to in this section are extended automatically during the course of any unresolved enforcement action regarding the regulated activity, or as requested by the Department.

(i) The confirmation of delivery; and

(ii) The DOT shipping papers prepared in accordance with 49 CFR part 172, subpart C, if applicable.

(c) Additional standards for reverse distributors managing evaluated hazardous waste pharmaceuticals. A reverse distributor that does not have a permit or interim status must comply with the following conditions, in addition to the requirements of paragraph (a) of this section, for the management of evaluated hazardous waste pharmaceuticals:

(1) Accumulation area at the reverse distributor. A reverse distributor must designate an on-site accumulation area where it will accumulate evaluated hazardous waste pharmaceuticals.

(2) Inspections of on-site accumulation area. A reverse distributor must inspect its on-site accumulation area at least once every seven (7) calendar days, looking at containers for leaks and for deterioration caused by corrosion or other factors, as well as for signs of diversion.

(3) Personnel training at a reverse distributor. Personnel at a reverse distributor that handle evaluated hazardous waste pharmaceuticals are subject to the training requirements of Section 262.17(a)(7).

(4) Labeling and management of containers at on-site accumulation areas. A reverse distributor accumulating evaluated hazardous waste pharmaceuticals in containers in an on-site accumulation area must:

(i) Label the containers with the words, "hazardous waste pharmaceuticals";

(ii) Ensure the containers are in good condition and managed to prevent leaks;

(iii) Use containers that are made of or lined with materials that will not react with, and are otherwise compatible with, the evaluated hazardous waste pharmaceuticals, so that the ability of the container to contain the waste is not impaired;

(iv) Keep containers closed, if holding liquid or gel evaluated hazardous waste pharmaceuticals. If the liquid or gel evaluated hazardous waste pharmaceuticals are in their original, intact, sealed packaging; or repackaged, intact, sealed packaging, they are considered to meet the closed container standard;

(v) Manage any container of ignitable or reactive evaluated hazardous waste pharmaceuticals, or any container of commingled incompatible evaluated hazardous waste pharmaceuticals so that the container does not have the potential to:

(A) Generate extreme heat or pressure, fire or 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 of hazardous waste pharmaceuticals; or

(E) Through other like means threaten human health or the environment; and

(vi) Accumulate evaluated hazardous waste pharmaceuticals that are prohibited from being combusted because of the dilution prohibition of Section 268.3(c) (e.g., arsenic trioxide (P012)) in separate containers from other evaluated hazardous waste pharmaceuticals at the reverse distributor.

(5) Hazardous waste numbers. Prior to shipping evaluated hazardous waste pharmaceuticals off site, all containers must be marked with the applicable hazardous waste numbers (i.e., hazardous waste codes). A nationally recognized electronic system, such as bar coding or radio frequency identification, may be used to identify the EPA Hazardous Waste Number(s).

(6) Shipments. A reverse distributor must ship evaluated hazardous waste pharmaceuticals that are destined for a permitted or interim status treatment, storage, or disposal facility in accordance with the applicable shipping standards in Section 266.508(a) or (b).

(7) Procedures for a reverse distributor for managing rejected shipments. A reverse distributor that sends a shipment of evaluated hazardous waste pharmaceuticals to a designated facility with the understanding that the designated facility can accept and manage the waste, and later receives that shipment back as a rejected load in accordance with the manifest discrepancy provisions of Section 264.72 or Section 265.72 of this chapter, may accumulate the returned evaluated hazardous waste pharmaceuticals on-site for up to an additional ninety (90) calendar days in the on-site accumulation area provided the rejected or returned shipment is managed in accordance with Sections 266.510(a) and (c). Upon receipt of the returned shipment, the reverse distributor must:

(i) Sign either:

(A) Item 18c of the original manifest, if the original manifest was used for the returned shipment; or

(B) Item 20 of the new manifest, if a new manifest was used for the returned shipment;

(ii) Provide the transporter a copy of the manifest;

(iii) Within thirty (30) calendar days of receipt of the rejected shipment of the evaluated hazardous waste pharmaceuticals, send a copy of the manifest to the designated facility that returned the shipment to the reverse distributor; and

(iv) Within ninety (90) calendar days of receipt of the rejected shipment, transport, or offer for transport the returned shipment of evaluated hazardous waste pharmaceuticals in accordance with the applicable shipping standards of Section 266.508(a) or (b).

(8) Land disposal restrictions. Evaluated hazardous waste pharmaceuticals are subject to the land disposal restrictions of part 268. A reverse distributor that accepts potentially creditable hazardous waste pharmaceuticals from off-site must comply with the land disposal restrictions in accordance with Section 268.7(a) requirements.

(9) Reporting by a reverse distributor for evaluated hazardous waste pharmaceuticals.

(i) Reporting by a reverse distributor. A reverse distributor that ships more than 1,000 kg per month of evaluated hazardous waste pharmaceuticals off-site must report to the Department in its quarterly report per Section 262.41. A reverse distributor that ships less than 1,000 kg per month of evaluated hazardous waste pharmaceuticals off-site must report to the Department in its annual declaration per Section 262.44.

(ii) Exception reporting by a reverse distributor for a missing copy of the manifest.

(A) For shipments from a reverse distributor to a designated facility.

(1) If a reverse distributor does not receive a copy of the manifest with the signature of the owner or operator of the designated facility within thirty-five (35) calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter, the reverse distributor must contact the transporter or the owner or operator of the designated facility to determine the status of the evaluated hazardous waste pharmaceuticals.

(2) A reverse distributor must submit an exception report to the Department for the state in which the reverse distributor is located if it has not received a copy of the manifest with the signature of the owner or operator of the designated facility within forty-five (45) calendar days of the date the evaluated hazardous waste pharmaceutical was accepted by the initial transporter. The exception report must include:

(i) A legible copy of the manifest for which the reverse distributor does not have confirmation of delivery; and

(ii) A cover letter signed by the reverse distributor, or its authorized representative, explaining the efforts taken to locate the evaluated hazardous waste pharmaceuticals and the results of those efforts.

(B) For shipments rejected by the designated facility and shipped to an alternate facility.

(1) A reverse distributor that does not receive a copy of the manifest with the signature of the owner or operator of the alternate facility within thirty-five (35) calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter must contact the transporter or the owner or operator of the alternate facility to determine the status of the hazardous waste. The thirty-five (35)-day time frame begins the date the evaluated hazardous waste pharmaceuticals are accepted by the transporter forwarding the hazardous waste shipment from the designated facility to the alternate facility.

(2) A reverse distributor must submit an exception report to the Department for the state in which the reverse distributor is located if it has not received a copy of the manifest with the signature of the owner or operator of the alternate facility within forty-five (45) calendar days of the date the evaluated hazardous waste pharmaceuticals were accepted by the initial transporter. The forty-five (45)-day timeframe begins the date the evaluated hazardous waste pharmaceuticals are accepted by the transporter forwarding the hazardous waste pharmaceutical shipment from the designated facility to the alternate facility. The exception report must include:

(i) A legible copy of the manifest for which the generator does not have confirmation of delivery; and

(ii) A cover letter signed by the reverse distributor, or its authorized representative, explaining the efforts taken to locate the evaluated hazardous waste pharmaceuticals and the results of those efforts.

(10) Recordkeeping by a reverse distributor for evaluated hazardous waste pharmaceuticals.

(i) A reverse distributor must keep a log (written or electronic) of the inspections of the on-site accumulation area, required by paragraph (c)(2) of this section. This log must be retained as a record for at least three (3) years from the date of the inspection.

(ii) A reverse distributor must keep a copy of each manifest signed in accordance with Section 262.23(a) for three (3) years or until it receives a signed copy from the designated facility that received the evaluated hazardous waste pharmaceutical. This signed copy must be retained as a record for at least three (3) years from the date the evaluated hazardous waste pharmaceutical was accepted by the initial transporter.

(iii) A reverse distributor must keep a copy of each quarterly report or annual declaration for at least three (3) years from the due date of the report or declaration.

(iv) A reverse distributor must keep a copy of each exception report for at least three years from the submission of the report.

(v) A reverse distributor must keep records to document personnel training, in accordance with Section 262.17(a)(7)(iv).

(vi) All records must be readily available upon request by an inspector. The periods of retention referred to in this section are extended automatically during the course of any unresolved enforcement action regarding the regulated activity, or as requested by the Department.

(d) When a reverse distributor must have a permit. A reverse distributor is an operator of a hazardous waste treatment, storage, or disposal facility and is subject to the requirements of parts 264, 265, and the permit requirements of part 270, if the reverse distributor:

- (1) Does not meet the conditions of this section;
- (2) Accepts manifested hazardous waste from off site; or
- (3) Treats or disposes of hazardous waste pharmaceuticals on-site.

HISTORY: Added by SCSR 44-11 Doc. No. 4976, eff November 27, 2020.

61-79.268. LAND DISPOSAL RESTRICTIONS.

SUBPART A

General

268.1. Purpose, scope and applicability.

(a) This part identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.

(b) Except as specifically provided otherwise in this regulation or R.61-79.261, the requirements of this regulation apply to persons who generate or transport hazardous waste and owners and operators of hazardous waste treatment, storage, and disposal facilities.

(c) Restricted wastes may continue to be land disposed as follows:

(1) Where persons have been granted an extension to the effective date of a prohibition pursuant to R.61-79.268 Subpart C or Section 268.5, with respect to those wastes covered by the extension;

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

(3) [Reserved]

(4) Wastes that are hazardous only because they exhibit a hazardous characteristic, and which are otherwise prohibited under this part, are not prohibited if the wastes meet any of the following criteria, unless the wastes are subject to a specified method of treatment other than DEACT in 268.40, or are D003 reactive cyanide:

(i) The wastes are managed in a treatment system which subsequently discharges to waters of the U.S. pursuant to a permit issued under section R.61-9 and R.61-68; or

(ii) The wastes are treated for purposes of the pretreatment requirements of section R.61-9 and R.61-68; or

(iii) The wastes are managed in a zero discharge system engaged in Clean Water Act equivalent treatment as defined in 268.37(a); and

(iv) The wastes no longer exhibit a prohibited characteristic at the point of land disposal (i.e., placement in a surface impoundment).

(d) The requirements of this part shall not affect the availability of a waiver under section 121(d)(4) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), (amended 11/90)

(e) The following hazardous wastes are not subject to any provision of part 268:

(1) Wastes generated by very small quantity generators, as defined in R.61-79.260.10;

(2) Waste pesticides that a farmer disposes of pursuant to 262.70;

(3) Wastes identified or listed as hazardous after November 8, 1984 for which EPA has not promulgated land disposal prohibitions or treatment standards (amended 11/90).

(4) De minimis losses of characteristic wastes to wastewaters are not considered to be prohibited wastes and are defined as losses from normal material handling operations (e.g. spills from the unloading or transfer of materials from bins or other containers, leaks from pipes, valves or other devices used to transfer materials); minor leaks of process equipment, storage tanks or containers; leaks from well maintained pump packings and seals; sample purgings; and relief device discharges; discharges from safety showers and rinsing and cleaning of personal safety equipment; rinsate from empty containers or from containers that are rendered empty by that rinsing; and laboratory wastes not exceeding one per cent of the total flow of wastewater into the facility's headworks on an annual basis, or with a combined annualized average concentration not exceeding one part per million in the headworks of the facility's wastewater treatment or pretreatment facility; (added 12/93; revised 5/96)

(5) [Reserved]

(f) Universal waste handlers and universal waste transporters (as defined in 260.10) are exempt from 268.7 and 268.50 for the hazardous wastes listed below. These handlers are subject to regulation under part 273.

- (1) Batteries as described in 273.2;
- (2) Pesticides as described in 273.3;
- (3) Mercury-containing equipment as described in 273.4;
- (4) Lamps as described in 273.5; and
- (5) Aerosol cans as described in 273.6 of this chapter.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

268.2. Definitions applicable in this part.

When used in this part the following terms have the meanings given below: (amended 11/90)

(a) "Halogenated organic compounds" or HOC's means those compounds having a carbon-halogen bond which are listed under Appendix III to this part.

(b) Hazardous constituent or constituents" means those constituents listed in Appendix VIII to R.61-79.261 of these Regulations.

(c) "Land disposal" means placement in or on the land, except in a corrective action management unit, or staging pile and includes, but is not limited to, placement in a landfill, surface impoundment, waste pile, injection well, land treatment facility, salt dome formation, salt bed formation, underground mine or cave, or placement in a concrete vault or bunker intended for disposal purposes (11/90; 12/92; 12/93).

(d) "Nonwastewaters" are wastes that do not meet the criteria for wastewaters in paragraph (f) of this section. (amended 11/90, 12/92)

(e) "Polychlorinated biphenyls" or PCB's are halogenated organic compounds defined in accordance with 40 CFR 761.3. (amended 11/90)

(f) "Wastewaters" are wastes that contain less than 1% by weight total organic carbon (TOC) and less than 1% by weight total suspended solids (TSS).(amended 11/90; moved 12/93)

(g) "Debris" means solid material exceeding a 60 mm particle size that is intended for disposal and that is: a manufactured object; or plant or animal matter; or natural geologic material. However, the following materials are not debris: any material for which a specific treatment standard is provided in subpart D, part 268, namely lead acid batteries, cadmium batteries, and radioactive lead solids; process residuals such as smelter slag and residues from the treatment of waste, wastewater, sludges, or air emission residues; and intact containers of hazardous waste that are not ruptured and that retain at least 75% of their original volume. A mixture of debris that has not been treated to the standards provided by 268.45 and other material is subject to regulation as debris if the mixture is comprised primarily of debris, by volume, based on visual inspection. (added 12/93; revised 5/96)

(h) "Hazardous debris" means debris that contains a hazardous waste listed in subpart D of part 261, or that exhibits a characteristic of hazardous waste identified in subpart C of part 261. Any deliberate mixing of prohibited hazardous waste with debris that changes its treatment classification (i.e., from waste to hazardous debris) is not allowed under the dilution prohibition in 268.3. (12/93)

(i) Underlying hazardous constituent means any constituent listed in 268.48, Table UTS - Universal Treatment Standards, except fluoride, selenium, sulfides, vanadium, and zinc, which can reasonably be expected to be present at the point of generation of the hazardous waste at a concentration above the constituent-specific UTS treatment standards. (12/93, 5/96, 9/98)

(j) "Inorganic metalbearing waste" is one for which EPA has established treatment standards for metal hazardous constituents, and which does not otherwise contain significant organic or cyanide content as described in 268.3(c)(1), and is specifically listed in appendix XI of this part.

(k) Soil means unconsolidated earth material composing the superficial geologic strata (material overlying bedrock), consisting of clay, silt, sand, or gravel size particles as classified by the U.S. Natural Resources Conservation Service, or a mixture of such materials with liquids, sludges or solids which is inseparable by simple mechanical removal processes and is made up primarily of soil by volume based on visual inspection. Any deliberate mixing of prohibited hazardous waste with soil that changes its treatment classification (i.e., from waste to contaminated soil) is not allowed under the dilution prohibition in 268.3. (11/99)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000.

268.3. Dilution prohibited as a substitute for treatment.

(a) Except as provided in paragraph (b) of this section, no generator, transporter, handler, or owner or operator of a treatment, storage, or disposal facility shall in any way dilute a restricted waste or the residual from treatment of a restricted waste as a substitute for adequate treatment to achieve compliance with subpart D of this part, to circumvent the effective date of a prohibition in subpart C of this part, to otherwise avoid a prohibition in subpart C of this part, or to circumvent a land disposal prohibition imposed by RCRA section 3004. (amended 11/90)

(b) Dilution of wastes that are hazardous only because they exhibit a characteristic in treatment systems which include land based units which treat wastes subsequently discharged to a water of the United States pursuant to a permit issued under section R.61-9 and R.61-68, or which treat wastes in a CWA equivalent treatment system, or which treat wastes for the purposes of pretreatment requirements under section 307 of the CWA is not impermissible dilution for purposes of this section unless a method other than DEACT has been specified in 268.40 as the treatment standard in 268.42, or unless the waste is a D003 reactive cyanide wastewater or nonwastewater. (revised 12/92; 12/93)

(c) Combustion of the hazardous waste codes listed in Appendix XI of this part is prohibited, unless the waste, at the point of generation, or after any bona fide treatment such as cyanide destruction prior to combustion, can be demonstrated to comply with one or more of the following criteria (unless otherwise specifically prohibited from combustion):

- (1) The waste contains hazardous organic constituents or cyanide at levels exceeding the constituent-specific treatment standard found in 268.48;
- (2) The waste consists of organic, debris-like materials (e.g., wood, paper, plastic, or cloth) contaminated with an inorganic metal-bearing hazardous waste;
- (3) The waste, at point of generation, has reasonable heating value such as greater than or equal to 5000 BTU per pound;
- (4) The waste is cogenerated with wastes for which combustion is a required method of treatment;
- (5) The waste is subject to Federal and/or State requirements necessitating reduction of organics (including biological agents); or
- (6) The waste contains greater than 1% Total Organic Carbon (TOC).

(d) It is a form of impermissible dilution, and therefore prohibited, to add iron filings or other metallic forms of iron to lead-containing hazardous wastes in order to achieve any land disposal restriction treatment standard for lead. Lead-containing wastes include D008 wastes (wastes exhibiting a characteristic due to the presence of lead), all characteristic wastes containing lead as an underlying hazardous constituent, listed wastes containing lead as a regulated constituent, and hazardous media containing any of the aforementioned lead-containing wastes.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999.

268.4. Treatment surface impoundment exemption.

(a) Wastes which are otherwise prohibited from land disposal under this part may be treated in a surface impoundment or series of impoundments provided that: (amended 11/90)

(1) Treatment of such wastes occurs in the impoundment;

(2) The following conditions are met: (amended 11/90)

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

(ii) Removal. The following treatment residues (including any liquid waste) must be removed at least annually: residues which do not meet the treatment standards promulgated under subpart D of this part; residues which do not meet the prohibition levels established under subpart C of this part or imposed by statute (where no treatment standards have been established); residues which are from the treatment of wastes prohibited from land disposal under subpart C of this part (where no treatment standards have been established and no prohibition levels apply); or residues from managing listed wastes which are not delisted under 260.22. If the volume of liquid flowing through the impoundment or series of impoundments annually is greater than the volume of the impoundment or impoundments, this flow-through constitutes removal of the supernatant for the purpose of this requirement.

(iii) Subsequent management. Treatment residues may not be placed in any other surface impoundment for subsequent management.

(iv) Recordkeeping: Sampling and testing and recordkeeping provisions of 264.13 and 265.13 of this chapter apply.

(3) The impoundment meets the design requirements of 264.221(c) or 265.221(a), regardless that the unit may not be new, expanded, or a replacement, and be in compliance with applicable groundwater monitoring requirements of subpart F of Part 264 or 265 unless: (amended 11/90)

(i) Exempted pursuant to 264.221 (d) or (e) of this chapter, or to 265.221(c) or (d) of this chapter; or

(ii) Upon application by the owner or operator, the Department, after notice and an opportunity to comment, has granted a waiver of the requirements on the basis that the surface impoundment:

(A) Has at least one liner, for which there is no evidence that such liner is leaking;

(B) Is located more than one-quarter mile from an underground source of drinking water; and

(C) Is in compliance with generally applicable groundwater monitoring requirements for facilities with permits; or,

(iii) Upon application by the owner or operator, the Department, after notice and an opportunity to comment, has granted a modification to the requirements on the basis of a demonstration

that the surface impoundment is located, designed, and operated so as to assure that there will be no migration of any hazardous constituent into groundwater or surface water at any future time.

(4) The owner or operator submits to the Department a written certification that the requirements of 268.4(a)(3) have been met and submits a copy of the waste analysis plan required under 268.4(a)(2). The following certification is required: (amended 11/90)

I certify under penalty of law that the requirements of 268.4(a)(3) have been met for all surface impoundments being used to treat restricted wastes. I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(b) Evaporation of hazardous constituents as the principal means of treatment is not considered to be treatment for purposes of an exemption under this section. (amended 11/90)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999.

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

(a) Any person who generates, treats, stores, or disposes of a hazardous waste may submit an application to the Department and the EPA for an extension to the effective date of any applicable restriction established under subpart C of this part. The applicant must demonstrate the following:

(1) He has made a good-faith effort to locate and contract with treatment, recovery, or disposal facilities nationwide to manage his waste in accordance with the effective date of the applicable restriction established under Subpart C;

(2) He has entered into a binding contractual commitment to construct or otherwise provide alternative treatment, recovery (e.g., recycling), or disposal capacity that meets the treatment standards specified in Subpart D or, where treatment standards have not been specified, such treatment, recovery, or disposal capacity is protective of human health and the environment.

(3) Due to circumstances beyond the applicant's control, such alternative capacity cannot reasonably be made available by the applicable effective date. This demonstration may include a showing that the technical and practical difficulties associated with providing the alternative capacity will result in the capacity not being available by the applicable effective date;

(4) The capacity being constructed or otherwise provided by the applicant will be sufficient to manage the entire quantity of waste that is the subject of the application;

(5) He provides a detailed schedule for obtaining required operating and construction permits on an outline of how and when alternative capacity will be available;

(6) He has arranged for adequate capacity to manage his waste during an extension and has documented in the application the location of all sites at which the waste will be managed; and

(7) Any waste managed in a surface impoundment or landfill during the extension period will meet the requirements of paragraph (h)(2).

(b) An authorized representative signing an application described under paragraph (a) shall make the following certification:

I certify under penalty of law that I have personally examined and that I am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(c) After receiving an application for an extension, the Department and EPA may request any additional information which it deems as necessary to evaluate the application.

(d) An extension will apply only to the waste generated at the individual facility covered by the application and will not apply to restricted waste from any other facility.

(e) On the basis of the information referred to in paragraph (a) of this section, after notice and opportunity for comment, and after consultation with appropriate State and federal agencies, the Department and the EPA may grant an extension of up to 1 year from the effective date. The

Department and the EPA may renew this extension for up to 1 additional year upon the request of the applicant if the demonstration required in paragraph (a) of this section can still be made. In no event will an extension extend beyond 24 months from the applicable effective date specified in subpart C of R.61-79.268. The length of any extension authorized will be determined by the Department and the EPA based on the time required to construct or obtain the type of capacity needed by the applicant as described in the completion schedule discussed in paragraph (a)(5) of this section. The Department and the EPA will give public notice of the intent to approve or deny a petition and provide an opportunity for public comment. The final decision on a petition will be published in the State and Federal Registers. (amended 11/90)

(f) Any person granted an extension under this section must immediately notify the Department and EPA as soon as he has knowledge of any change in the conditions certified to in the application.

(g) Any person granted an extension under this section shall submit written progress reports at intervals designated by the Department and EPA. Such reports must describe the overall progress made toward constructing or otherwise providing alternative treatment, recovery or disposal capacity; must identify any event which may cause or has caused a delay in the development of the capacity; and must summarize the steps taken to mitigate the delay. The Department and EPA can revoke the extension at any time if the applicant does not demonstrate a good-faith effort to meet the schedule for completion, if the Department and EPA denies or revokes any required permit, if conditions certified in the application change, or for any violation of this chapter.

(h) Whenever the Department and EPA establishes an extension to an effective date under this section, during the period for which such extension is in effect: (amended 11/90)

(1) The storage restrictions under R.61-79.268.50(a) do not apply; and

(2) Such hazardous waste may be disposed in a landfill or surface impoundment only if such unit is in compliance with the technical requirements of the following provisions regardless of whether such unit is existing, new, or a replacement or lateral expansion:

(i) The landfill, if in interim status, is in compliance with the requirements of subpart F of R.61-79.265 and R.61-79.265.301 (a), (c), and (d) of this chapter; or,

(ii) The landfill, if permitted, is in compliance with the requirements of subpart F of R.61-79.264 and R.61-79.264.301 (c), (d) and (e) of this chapter; or

(iii) The surface impoundment, if in interim status, is in compliance with the requirements of subpart F of R.61-79.265, R.61-79.265.221 (a), (c), and (d) of this chapter, and RCRA section 3005(j)(1); (revised 12/92) or

(iv) The surface impoundment, if permitted, is in compliance with the requirements of subpart F of part 264 and R.61-79.264.221 (c), (d) and (e) of this chapter; or

(v) The surface impoundment, if newly subject to RCRA section 3005(j)(1) due to the promulgation of additional listings or characteristics for the identification of hazardous waste, is in compliance with the requirements of subpart F of part 265 of this chapter within 12 months after the promulgation of additional listings or characteristics of hazardous waste, and with the requirements of § 265.221 (a), (c) and (d) of this chapter within 48 months after the promulgation of additional listings or characteristics of hazardous waste. If a national capacity variance is granted, during the period the variance is in effect, the surface impoundment, if newly subject to RCRA section 3005(j)(1) due to the promulgation of additional listings or characteristics of hazardous waste, is in compliance with the requirements of subpart F of part 265 of this chapter within 12 months after the promulgation of additional listings or characteristics of hazardous waste, and with the requirements of 265.221 (a), (c) and (d) of this chapter within 48 months after the promulgation of additional listings or characteristics of hazardous waste; or

(vi) The landfill, if disposing of containerized liquid hazardous wastes containing PCB's at concentrations greater than or equal to 50 ppm but less than 500 ppm, is also in compliance with the requirements of 40 CFR 761.75 and parts 264 and 265.

(i) Pending a decision on the application the applicant is required to comply with all restrictions on land disposal under this part once the effective date for the waste has been reached.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

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

(a) Any person seeking an exemption from a prohibition under subpart C of this part for the disposal of a restricted hazardous waste in a particular unit or units must submit a petition to the Department and the EPA demonstrating, to a reasonable degree of certainty, that there will be no migration of hazardous constituents from the disposal unit or injection zone for as long as the wastes remain hazardous. The demonstration must include the following components:

- (1) An identification of the specific waste and the specific unit for which the demonstration will be made;
- (2) A waste analysis to describe fully the chemical and physical characteristics of the subject waste;
- (3) A comprehensive characterization of the disposal unit site including an analysis of background air, soil, and water quality.
- (4) A monitoring plan that detects migration at the earliest practicable time;
- (5) Sufficient information to assure the Department and the EPA that the owner or operator of a land disposal unit receiving restricted waste(s) will comply with other applicable Federal, State, and local laws. (amended 11/90)

(b) The demonstration referred to in paragraph (a) must meet the following criteria:

- (1) All waste and environmental sampling, test, and analysis data must be accurate and reproducible to the extent that state-of-the-art techniques allow;
- (2) All sampling, testing, and estimation techniques for chemical and physical properties of the waste and all environmental parameters must have been approved by the Department and EPA;
- (3) Simulation models must be calibrated for the specific waste and site conditions, and verified for accuracy by comparison with actual measurements;
- (4) A quality assurance and quality control plan that addresses all aspects of the demonstration must be approved by the Department and EPA; and,
- (5) An analysis must be performed to identify and quantify any aspects of the demonstration that contribute significantly to uncertainty. This analysis must include an evaluation of the consequences of predictable future events, including, but not limited to, earthquakes, floods, severe storm events, droughts, or other natural phenomena.

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

(1) A monitoring plan that describes the monitoring program installed at and/or around the unit to verify continued compliance with the conditions of the variance. This monitoring plan must provide information on the monitoring of the unit and/or the environment around the unit. The following specific information must be included in the plan:

- (i) The media monitored in the cases where monitoring of the environment around the unit is required;
- (ii) The type of monitoring conducted at the unit, in the cases where monitoring of the unit is required;
- (iii) The location of the monitoring stations;
- (iv) The monitoring interval (frequency of monitoring at each station);
- (v) The specific hazardous constituents to be monitored;
- (vi) The implementation schedule for the monitoring program;
- (vii) The equipment used at the monitoring stations;
- (viii) The sampling and analytical techniques employed; and
- (ix) The data recording/reporting procedures.

(2) Where applicable, the monitoring program described in paragraph (c)(1) of this section must be in place for a period of time specified by the Department and EPA, as part of his approval of the petition, prior to receipt of prohibited waste at the unit.

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

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

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

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

(ii) All estimation and monitoring techniques must be approved by the Department and EPA.

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

(d) Each petition must be submitted to the Department and EPA. (amended 11/90)

(e) After a petition has been approved, the owner or operator must report any changes in conditions at the unit and/or the environment around the unit that significantly depart from the conditions described in the variance and affect the potential for migration of hazardous constituents from the units as follows: (amended 11/90)

(1) If the owner or operator plans to make changes to the unit design, construction, or operation, such a change must be proposed, in writing, and the owner or operator must submit a demonstration to the Department and EPA at least 30 days prior to making the change. The Department and EPA will determine whether the proposed change invalidates the terms of the petition and will determine the appropriate response. Any change must be approved by the Department and EPA prior to being made.

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

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

(1) Immediately suspend receipt of prohibited waste at the unit, and

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

(3) Following receipt of the notification the Department and EPA will determine, within 60 days of receiving notification, whether the owner or operator can continue to receive prohibited waste in the unit and whether the variance is to be revoked. The Department and EPA shall also determine whether further examination of any migration is warranted under applicable provisions of part 264 or part 265.

(g) Each petition must include the following statement signed by the petitioner or an authorized representative: (moved 11/90)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this petition and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

(h) After receiving a petition, the Department and EPA may request any additional information that reasonably may be required to evaluate the demonstration. (moved 11/90)

(i) If approved, the petition will apply to land disposal of the specific restricted waste at the individual disposal unit described in the demonstration and will not apply to any other restricted waste at that disposal unit, or to that specific restricted waste at any other disposal unit. (moved 11/90)

(j) The Department and EPA will give public notice in the State Register and the Federal Register of the intent to approve or deny a petition and provide an opportunity for public comment. The final decision on a petition will be published in the State Register. (moved 11/90, 12/92)

(k) The term of a petition granted under this section shall be no longer than the term of the RCRA permit if the disposal unit is operating under a RCRA permit, or up to a maximum of 10 years from the date of approval provided under paragraph (g) of this section if the unit is operating under interim status. In either case, the term of the granted petition shall expire upon the termination or denial of a RCRA permit, or upon the termination of interim status or when the volume limit of waste to be land disposed during the term of petition is reached. (amended 11/90)

(l) Prior to the Department and EPA's decision, the applicant is required to comply with all restrictions on land disposal under this part once the effective date for the waste has been reached. (moved)

(m) The petition granted by the Department and EPA does not relieve the petitioner of his responsibilities in the management of hazardous waste under R.61-79.260 through 271. (moved 11/90)

(n) Liquid hazardous wastes containing polychlorinated biphenyls at concentrations greater than or equal to 500 ppm are not eligible for an exemption under this section. (amended 11/90)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

268.7. Testing, tracking, and recordkeeping requirements for generators, reverse distributors, treaters, and disposal facilities.

(a) Requirements for generators and reverse distributors:

(1) A generator of hazardous waste must determine if the waste has to be treated before it can be land disposed. This is done by determining if the hazardous waste meets the treatment standards in 268.40, 268.45, or 268.49. This determination can be made concurrently with the hazardous waste determination required in 262.11, in either of two ways: testing the waste or using knowledge of the waste. If the generator tests the waste, testing would normally determine the total concentration of hazardous constituents, or the concentration of hazardous constituents in an extract of the waste obtained using test method 1311 in "Test Methods of Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, (incorporated by reference, see 260.11), depending on whether the treatment standard for the waste is expressed as a total concentration or concentration of hazardous constituent in the waste's extract. (Alternatively, the generator must send the waste to a RCRA-permitted hazardous waste treatment facility, where the waste treatment facility must comply with the requirements of 264.13 of this chapter and paragraph (b) of this section.) In addition, some hazardous wastes must be treated by particular treatment methods before they can be land disposed and some soils are contaminated by such hazardous wastes. These treatment standards are also found in 268.40, and are described in detail in 268.42, Table 1. These wastes, and soils contaminated with such wastes, do not need to be tested (however, if they are in a waste mixture, other wastes with concentration level treatment standards would have to be tested). If a generator determines they are managing a waste or soil contaminated with a waste, that displays a hazardous characteristic of ignitability, corrosivity, reactivity, or toxicity, they must comply with the special requirements of 268.9 of this part in addition to any applicable requirements in this section.

(2) If the waste or contaminated soil does not meet the treatment standards, or if the generator chooses not to make the determination of whether his waste must be treated, with the initial shipment of waste to each treatment or storage facility, the generator must send a one-time written notice to each treatment or storage facility receiving the waste, and place a copy in the file. The notice must include the information in column "268.7(a)(2)" of the Generator Paperwork Requirements Table in paragraph (a)(4) of this section. (Alternatively, if the generator chooses not to make the determination of whether the waste must be treated, the notification must include the EPA Hazardous Waste Numbers and Manifest Number of the first shipment and must state "This hazardous waste may or may not be subject to the LDR treatment standards. The treatment facility must make the determination.") No further notification is necessary until such time that the waste or facility change, in which case a new notification must be sent and a copy placed in the generator's file.

(i) For contaminated soil, the following certification statement should be included, signed by an authorized representative:

I certify under penalty of law that I personally have examined this contaminated soil and it [does/does not] contain listed hazardous waste and [does/does not] exhibit a characteristic of

hazardous waste and requires treatment to meet the soil treatment standards as provided by 268.49(c).

(ii) [Reserved]

(3) If the waste or contaminated soil meets the treatment standard at the original point of generation:

(i) With the initial shipment of waste to each treatment, storage, or disposal facility, the generator must send a onetime written notice to each treatment, storage, or disposal facility receiving the waste, and place a copy in the file. The notice must include the information indicated in column “268.7(a)(3)” of the Generator Paperwork Requirements Table in 268.7(a)(4) and the following certification statement, signed by an authorized representative:

I certify under penalty of law that I personally have examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in part 268, subpart D I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

(ii) For contaminated soil, with the initial shipment of wastes to each treatment, storage, or disposal facility, the generator must send a one-time written notice to each facility receiving the waste and place a copy in the file. The notice must include the information in column “268.7(a)(3)” of the Generator Paperwork Requirements Table in 268.7(a)(4).

(iii) If the waste changes, the generator must send a new notice and certification to the receiving facility, and place a copy in their files. Generators of hazardous debris excluded from the definition of hazardous waste under 261.3(f) of this chapter are not subject to these requirements.

(4) For reporting, tracking, and recordkeeping when exceptions allow certain wastes or contaminated soil that do not meet the treatment standards to be land disposed: There are certain exemptions from the requirement that hazardous wastes or contaminated soil meet treatment standards before they can be land disposed. These include, but are not limited to case-by-case extensions under 268.5, disposal in a no-migration unit under 268.6, or a national capacity variance or case-by-case capacity variance under subpart C of this part. If a generator’s waste is so exempt, then with the initial shipment of waste, the generator must send a one-time written notice to each land disposal facility receiving the waste. The notice must include the information indicated in column “268.7(a)(4)” of the Generator Paperwork Requirements Table below. If the waste changes, the generator must send a new notice to the receiving facility, and place a copy in their files. (11/90, 12/92; 5/96, 9/98)

268.7(a)(4) table

Required information	268.7(a)(2)	268.7(a)(3)	268.7(a)(4)	268.7(a)(9)
1. EPA Hazardous Waste and Manifest numbers and Manifest Number of first shipment	x	x	x	x
2. Statement: this waste is not prohibited from land disposal			x	
3. The waste is subject to the LDRs. The constituents of concern for F001-F005, and F039, and underlying hazardous constituents in characteristic wastes, unless the waste will be treated and monitored for all constituents. If all constituents will be treated and monitored, there is no need to put them all on the LDR notice				
4. The notice must include the applicable wastewater/nonwastewater category (see 268.2(d) and (f)) and subdivisions made with-	x	x		

Required information	268.7(a)(2)	268.7(a)(3)	268.7(a)(4)	268.7(a)(9)
in a waste code based on waste-specific criteria (such as D003 reactive cyanide)				
5. Waste analysis data (when available)	x	x	x	
6. Date the waste is subject to the prohibition			x	
7. For hazardous debris, when treating with the alternative treatment technologies provided by 268.45: the contaminants subject to treatment, as described in 268.45(b); and an indication that these contaminants are being treated to comply with 268.45	x		x	
8. For contaminated soil subject to LDRs as provided in 268.49(a) the constituents subject to treatment as described in 268.49(d) and the following statement: This contaminated soil (does/does not) contain listed hazardous waste and (does/does not) exhibit a characteristic of hazardous waste and [is subject to/complies with] the soil treatment standards as provided by 268.49(c) or the universal treatment standards	x	x		
9. A certification is needed (see applicable section for exact wording)		x		x

(5) If a generator is managing and treating prohibited waste or contaminated soil in tanks, containers, or containment buildings regulated under R.61-79.262.15, 262.16, and 262.17 to meet applicable LDR treatment standards found at 268.40, the generator must develop and follow a written waste analysis plan which describes the procedures they will carry out to comply with the treatment standards. (Generators treating hazardous debris under the alternative treatment standards of Table 1, 268.45, however, are not subject to these waste analysis requirements.) The plan must be kept on site in the generator's records, and the following requirements must be met:

(i) The waste analysis plan must be based on a detailed chemical and physical analysis of a representative sample of the prohibited waste(s) being treated, and contain all information necessary to treat the waste(s) in accordance with the requirements of this part, including the selected testing frequency.

(ii) Such plan must be kept in the facility's on-site files and made available to inspectors.

(iii) Wastes shipped off site pursuant to this paragraph must comply with the notification requirements of section 268.7(a)(3).

(6) If a generator determines that the waste or contaminated soil is restricted based solely on his knowledge of the waste, all supporting data used to make this determination must be retained on-site in the generator's files. If a generator determines that the waste is restricted based on testing this waste or an extract developed using the test method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW846, as referenced in 260.11 of this chapter, and all waste analysis data must be retained on-site in the generator's files. (9/98)

(7) If a generator determines that he or she is managing a prohibited waste that is excluded from the definition of hazardous or solid waste or is exempted from Subtitle C regulation under 261.2 through 261.6 subsequent to the point of generation (including deactivated characteristic hazardous wastes managed in wastewater treatment systems subject to the Clean Water Act (CWA) as specified

at 261.4(a)(2), or are CWA equivalent, or are managed in an underground injection well regulated by R.61-9 and R.61-68), he or she must place a one-time notice describing such generation, subsequent exclusion from the definition of hazardous or solid waste or exemption from RCRA Subtitle C regulation, and the disposition of the waste, in the facility's on-site files.

(8) Generators must retain onsite a copy of all notices, certifications, waste analysis data, and other documentation produced pursuant to this section for at least three years from the date that the waste that is the subject of such documentation was last sent to onsite or offsite treatment, storage, or disposal. The three year record retention period is automatically extended during the course of any unresolved enforcement action regarding the regulated activity or as requested by the Department. The requirements of this paragraph apply to solid wastes even when the hazardous characteristic is removed prior to disposal, or when the waste is excluded from the definition of hazardous or solid waste under 261.2 through 261.6, or exempted from Subtitle C regulation, subsequent to the point of generation. (revised 12/92)

(9) If a generator is managing a lab pack containing hazardous wastes and wishes to use the alternative treatment standard for lab packs found at 268.42(c):

(i) "I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only wastes that have not been excluded under appendix IV to part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment."

(ii) No further notification is necessary until such time that the wastes in the lab pack change, or the receiving facility changes, in which case a new notice and certification must be sent and a copy placed in the generator's file.

(iii) If the lab pack contains characteristic hazardous wastes (D001—D043), underlying hazardous constituents (as defined in 268.2(i)) need not be determined.

(iv) The generator must also comply with the requirements in paragraphs(a)(6) and (a)(7) of this section.

(10) Small quantity generators with tolling agreements pursuant to 262.20(e) must comply with the applicable notification and certification requirements of paragraph (a) of this section for the initial shipment of the waste subject to the agreement. Such generators must retain on-site a copy of the notification and certification, together with the tolling agreement, for at least three years after termination or expiration of the agreement. The three-year record retention period is automatically extended during the course of any unresolved enforcement action regarding the regulated activity or as requested by the Department.

(b) Treatment facilities must test their wastes according to the frequency specified in their waste analysis plans as required by 264.13 (for permitted TSDs) or 265.13 (for interim status facilities). Such testing must be performed as provided in paragraphs (b)(1), (b)(2) and (b)(3) of this section. (9/98)

(1) For wastes or contaminated soil with treatment standards expressed in the waste extract (TCLP), the owner or operator of the treatment facility must test an extract of the treatment residues, using test method 1311 (the Toxicity Characteristic Leaching Procedure, described in "Test Methods for Evaluating Solid Waste. Physical/Chemical Methods," EPA Publication SW-846 as incorporated by reference in 260.11 of this chapter) to assure that the treatment residues extract meet the applicable treatment standards. (9/98)

(2) For wastes or contaminated soil with treatment standards expressed as concentrations in the waste, the owner or operator of the treatment facility must test the treatment residues (not an extract of such residues) to assure that they meet the applicable treatment standards. (9/98)

(3) A one-time notice must be sent with the initial shipment of waste or contaminated soil to the land disposal facility. A copy of the notice must be placed in the treatment facility's file. (9/98)

TREATMENT FACILITY PAPERWORK REQUIREMENTS TABLE 268.7 (9/98, 11/99)

Required Information	268.7(b)
1. EPA Hazardous Waste and Manifest numbers and Manifest Number of first shipment	x

2. The waste is subject to the LDRs. The constituents of concern for F001-F005 and F039 and underlying constituents in characteristic wastes, unless the wastes will be treated and monitored for all constituents. If all constituents will be treated and monitored, there is no need to put them all on the LDR notice x
3. The notice must include the applicable wastewater/nonwastewater category (see 268.2(d) and (f) and subdivisions made within a waste code based on waste-specific criteria (such as D003 reactive cyanide) x
4. Waste analysis data (when available) x
5. For contaminated soil subject to LDRs as provided in 268.49(a), the constituents subject to treatment as described in 268.49(d) and the following statement: "This contaminated soil [does/does not] exhibit a characteristic of hazardous waste and [is subject to/complies with] the soil treatment standards as provided by 268.49(c)" x
6. A certification is needed (see applicable section for exact wording) x

(4) The treatment facility must submit a one-time certification signed by an authorized representative with the initial shipment of waste or treatment residue of a restricted waste to the land disposal facility. A certification is also necessary for contaminated soil and it must state:

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 268.49 without impermissible dilution of the prohibited wastes. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment."

"I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment. (12/93, (9/98))"

(i) A copy of the certification must be placed in the treatment facility's onsite files. If the waste or treatment residue changes, or the receiving facility changes, a new certification must be sent to the receiving facility, and a copy placed in the file. (revised 12/92)

(ii) Debris excluded from the definition of hazardous waste under 261.3(f) of this chapter (i.e., debris treated by an extraction or destruction technology provided by Table 1, 268.45, and debris that the Director has determined does not contain hazardous waste), however, is subject to the notification and certification requirements of paragraph (d) of this section rather than the certification requirements of this paragraph.

(iii) For wastes with organic constituents having treatment standards expressed as concentration levels, if compliance with the treatment standards is based in whole or in part on the analytical detection limit alternative specified in 268.40(d), the certification, signed by an authorized representative, must state the following: (new 12/92)

I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion units as specified in 268.42, Table 1. I have been unable to detect the nonwastewater organic constituents, despite having used best goodfaith efforts to analyze for such constituents. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

(iv) For characteristic wastes that are subject to the treatment standards in 268.40 (other than those expressed as a method of treatment), or 268.49, and that contain underlying hazardous constituents as defined in 268.2(i); if these wastes are treated on-site to remove the hazardous

characteristic; and are then sent off-site for treatment of underlying hazardous constituents, the certification must state the following: (11/99)

“I certify under penalty of law that the waste has been treated in accordance with the requirements of 268.40 or 268.49 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.”

(v) For characteristic wastes that contain underlying hazardous constituents as defined 268.2(i) that are treated on-site to remove the hazardous characteristic to treat underlying hazardous constituents to levels in 268.48 Universal Treatment Standards, the certification must state the following:

“I certify under penalty of law that the waste has been treated in accordance with the requirements of 268.40 to remove the hazardous characteristic and that underlying hazardous constituents, as defined in 268.2(i) have been treated on-site to meet the 268.48 Universal Treatment Standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.”

(5) If the waste or treatment residue will be further managed at a different treatment or, storage, or disposal facility, the treatment, storage, or disposal facility sending the waste or treatment residue offsite must comply with the notice and certification requirements applicable to generators under this section. (9/98)

(6) Where the wastes are recyclable materials used in a manner constituting disposal subject to the provisions of 266.20(b) regarding treatment standards and prohibition levels, the owner or operator of a treatment facility (*i.e.*, the recycler) must, for the initial shipment of waste, prepare a one-time certification described in paragraph (b)(4) of this section, and a one-time notice which includes the information in paragraph (b)(3) of this section except the manifest number) The certification and notification must be placed in the facility's on-site files. If the waste or the receiving facility changes, a new certification and notification must be prepared and placed in the on site files. In addition, the recycling facility must also keep records of the name and location of each entity receiving the hazardous waste-derived product.

(c) Except where the owner or operator is disposing of any waste that is a recyclable material used in a manner constituting disposal pursuant to 266.20(b), the owner or operator of any land disposal facility disposing any waste subject to restrictions under this part must:

(1) Have copies of the notice and certifications specified in paragraph (a) or (b) of this section.

(2) Test the waste, or an extract of the waste or treatment residue developed using test method 1311 (the Toxicity Characteristic Leaching Procedure), described in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW846 as incorporated by reference in 260.11 of this chapter), to assure that the wastes or treatment residues are in compliance with the applicable treatment standards set forth in subpart D of this part. Such testing must be performed according to the frequency specified in the facility's waste analysis plan as required by 264.13 or 265.13 of this chapter.

(d) Generators or treaters who first claim that hazardous debris is excluded from the definition of hazardous waste under 261.3 (f) (*i.e.*, debris treated by an extraction or destruction technology provided by Table 1, 268.45, and debris that the Department has determined does not contain hazardous waste) are subject to the following notification and certification requirements:

(1) A onetime notification, including the following information, must be submitted to the Department to implement part 268 requirements:

(i) The name and address of the Subtitle D facility receiving the treated debris;

(ii) A description of the hazardous debris as initially generated, including the applicable EPA Hazardous Waste Number(s); and

(iii) For debris excluded under § 261.3(f)(1) of this chapter, the technology from Table 1, § 268.45, used to treat the debris.

(2) The notification must be updated if the debris is shipped to a different facility, and, for debris excluded under 261.2(f)(1) of this chapter, if a different type of debris is treated or if a different technology is used to treat the debris.

(3) For debris excluded under § 261.3(f)(1) of this chapter, the owner or operator of the treatment facility must document and certify compliance with the treatment standards of Table 1, 268.45, as follows:

(i) Records must be kept of all inspections, evaluations, and analyses of treated debris that are made to determine compliance with the treatment standards;

(ii) Records must be kept of any data or information the treater obtains during treatment of the debris that identifies key operating parameters of the treatment unit; and

(iii) For each shipment of treated debris, a certification of compliance with the treatment standards must be signed by an authorized representative and placed in the facility's files. The certification must state the following: "I certify under penalty of law that the debris has been treated in accordance with the requirements of 268.45. I am aware that there are significant penalties for making a false certification, including the possibility of fine and imprisonment.

(e) Generators and treaters who first receive from EPA or an authorized state a determination that a given contaminated soil subject to LDRs as provided in 268.49(a) no longer contains a listed hazardous waste and generators and treaters who first determine that a contaminated soil subject to LDRs as provided in 268.49(a) no longer exhibits a characteristic of hazardous waste must:

(1) Prepare a one-time only documentation of these determinations including all supporting information; and,

(2) Maintain that information in the facility files and other records for a minimum of three years.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 20, Issue No. 12, eff December 27, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 44-11 Doc. No. 4976, eff November 27, 2020; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

268.9. Special rules regarding wastes that exhibit a characteristic.

(a) The initial generator of a solid waste must determine each EPA Hazardous Waste Number (waste code) applicable to the waste in order to determine the applicable treatment standards under subpart D of this part. This determination may be made concurrently with the hazardous waste determination required in 262.11. For purposes of part 268, the waste will carry the waste code for any applicable listed waste (part 261, subpart D). In addition, where the waste exhibits a characteristic, the waste will carry one or more of the characteristic waste codes (part 261, subpart C), except when the treatment standard for the listed waste operates in lieu of the treatment standard for the characteristic waste, as specified in paragraph (b) of this section. If the generator determines that their waste displays a hazardous characteristic (and is not D001 nonwastewaters treated by CMBST, RORGS, OR POLYM of 268.42, Table 1), the generator must determine the underlying hazardous constituents (as defined at 268.2(i)) in the characteristic waste.

(b) Where a prohibited waste is both listed under part 261, subpart D and exhibits a characteristic under part 261, subpart C, the treatment standard for the waste code listed in part 261, subpart D will operate in lieu of the standard for the waste code under part 261, subpart C, provided that the treatment standard for the listed waste includes a treatment standard for the constituent that causes the waste to exhibit the characteristic. Otherwise, the waste must meet the treatment standards for all applicable listed and characteristic waste codes.

(c) In addition to any applicable standards determined from the initial point of generation, no prohibited waste which exhibits a characteristic under 261 subpart C may be land disposed unless the waste complies with the treatment standards under subpart D of this part.

(d) Wastes that exhibit a characteristic are also subject to 268.7 requirements, except that once the waste is no longer hazardous, a one-time notification and certification must be placed in the generator's

or treater's on-site files. The notification and certification must be updated if the process or operation generating the waste changes and/or if the subtitle D facility receiving the waste changes.

(1) The notification must include the following information:

(i) Name and address of the RCRA Subtitle D facility receiving the waste shipment; and (revised 12/93)

(ii) A description of the waste as initially generated, including the applicable EPA hazardous waste code(s), treatability group(s), and underlying hazardous constituents (as defined in 268.2(i)), unless the waste will be treated and monitored for all underlying hazardous constituents. If all underlying hazardous constituents will be treated and monitored, there is no requirement to list any of the underlying hazardous constituents on the notice. (revised 12/93; 5/96)

(iii) [Reserved. (5/96)]

(2) The certification must be signed by an authorized representative and must state the language found in 268.7(b)(4). (12/93)

(i) If treatment removes the characteristic but does not meet standards applicable to underlying hazardous constituents, then the certification found in 268.7 (b)(4)(iv) applies. (5/96)

(ii) [Reserved 5/96]

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

SUBPART B

Schedule for Land Disposal Prohibition and Establishment of Treatment Standards

268.13. Schedule for wastes identified or listed after November 8, 1984.

In the case of any hazardous waste identified or listed under SCHWMA 44-56-30 or RCRA section 3001 after November 8, 1984, the Department shall make a land disposal prohibition determination within 6 months after the date of identification or listing.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

268.14. Surface impoundment exemptions.

(a) This section defines additional circumstances under which an otherwise prohibited waste may continue to be placed in a surface impoundment.

(b) Wastes which are newly identified or listed under section 3001 after November 8, 1984, and stored in a surface impoundment that is newly subject to subtitle C of RCRA as a result of the additional identification or listing, may continue to be stored in the surface impoundment for 48 months after the promulgation of the additional listing or characteristic, notwithstanding that the waste is otherwise prohibited from land disposal, provided that the surface impoundment is in compliance with the requirements of subpart F of part 265 of this chapter within 12 months after promulgation of the new listing or characteristic.

(c) Wastes which are newly identified or listed under section 3001 after November 8, 1984, and treated in a surface impoundment that is newly subject to subtitle C of RCRA as a result of the additional identification or listing, may continue to be treated in that surface impoundment, notwithstanding that the waste is otherwise prohibited from land disposal, provided that surface impoundment is in compliance with the requirements of subpart F of part 265 of this chapter within 12 months after the promulgation of the new listing or characteristic. In addition, if the surface impoundment continues to treat hazardous waste after 48 months from promulgation of the additional listing or characteristic, it must then be in compliance with 268.4.

268.20. Waste specific prohibitions – Dyes and/or pigments production wastes.

(a) Effective August 23, 2005, the waste specified in part 261 as EPA Hazardous Waste Number K181, and soil and debris contaminated with this waste, radioactive wastes mixed with this waste, and

soil and debris contaminated with radioactive wastes mixed with this waste are prohibited from land disposal.

- (b) The requirements of paragraph (a) of this section do not apply if:
- (1) The wastes meet the applicable treatment standards specified in subpart D of this Part;
 - (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition;
 - (3) The wastes meet the applicable treatment standards established pursuant to a petition granted under 268.44;
 - (4) Hazardous debris has met the treatment standards in 268.40 or the alternative treatment standards in 268.45; or
 - (5) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract of the waste, or the generator may use knowledge of the waste. If the waste contains regulated constituents in excess of the applicable subpart D levels, the waste is prohibited from land disposal, and all requirements of 268 are applicable, except as otherwise specified.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART C
Prohibitions on Land Disposal

268.30. Waste specific prohibitions—wood preserving wastes.

(a) Effective August 11, 1997, the following wastes are prohibited from land disposal: the wastes specified in 261 as EPA Hazardous Waste numbers F032, F034, and F035.

(b) Effective May 12, 1999, the following wastes are prohibited from land disposal: soil and debris contaminated with F032, F034, F035; and radioactive wastes mixed with EPA Hazardous waste numbers F032, F034, and F035.(revised 12/92)

(c) Between May 12, 1997 and May 12, 1999, soil and debris contaminated with F032, F034, F035; and radioactive waste mixed with F032, F034, and F035 may be disposed in a landfill or surface impoundment only if such unit is in compliance with the requirements specified in 268.5(h)(2) of this part. (amended 11/90, 12/92)

- (d) The requirements of paragraphs (a) and (b) of this section do not apply if: (amended 11/90)
- (1) The wastes meet the applicable treatment standards of subpart D of this part; or
 - (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition; or
 - (3) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to those wastes covered by the extension.

(e) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains constituents in excess of the applicable Universal Treatment Standard levels of 268.48 of this part, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992, State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

268.31. Waste specific prohibitions—dioxin-containing wastes.

(a) Effective November 8, 1988, the dioxin-containing wastes specified in 261.31 as EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, F027, and F028, are prohibited from land disposal unless the following condition applies:

(1) The F020-F023 and F026-F028 dioxin-containing waste is contaminated soil and debris resulting from a response action taken under section 104 or 106 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) or a corrective action taken under subtitle C of the Resource Conservation and Recovery Act (RCRA).

(2) [Blank]

(b) Effective November 8, 1990, the F020—F023 and F026—F028 dioxin—containing wastes listed in paragraph (a)(1) are prohibited from land disposal.

(c) Between November 8, 1988, and November 8, 1990, wastes included in paragraph (a)(1) may be disposed in a landfill or surface impoundment only if such unit is in compliance with the requirements specified in 268.5(h)(2) and all other applicable requirements of Parts 264 and 265 of this chapter.

(d) The requirements of paragraphs (a) and (b) do not apply if:

(1) The wastes meet the standards of subpart D of this part; or

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

(3) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to those wastes covered by the extension.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

268.32. Soils exhibiting the toxicity characteristic for metals and containing PCBs.

(a) Effective December 26, 2000, the following wastes are prohibited from land disposal: any volumes of soil exhibiting the toxicity characteristic solely because of the presence of metals (D004 - D011) and containing PCBs.

(b) The requirements of paragraph (a) of this section do not apply if:

(1)(i) The wastes contain halogenated organic compounds in total concentration less than 1,000 mg/kg; and

(ii) The wastes meet the treatment standards specified in Subpart D of this part for EPA hazardous waste numbers D004 - D011, as applicable; or

(2)(i) The wastes contain halogenated organic compounds in total concentration less than 1,000 mg/kg; and

(ii) The wastes meet the alternative treatment standards specified in 268.49 for contaminated soil; or

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

(4) The wastes meet applicable alternative treatment standards established pursuant to a petition granted under 268.44.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

268.33. Waste-specific prohibitions — chlorinated aliphatic wastes.

(a) Effective May 8, 2001, the wastes specified in part 261 as EPA Hazardous Wastes Numbers K174, and K175, soil and debris contaminated with these wastes, radioactive wastes mixed with these wastes, and soil and debris contaminated with radioactive wastes mixed with these wastes are prohibited from land disposal.

(b) The requirements of paragraph (a) of this section do not apply if:

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

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

(3) The wastes meet the applicable treatment standards established pursuant to a petition granted under 268.44;

(4) Hazardous debris has met the treatment standards in 268.40 or the alternative treatment standards in 268.45; or

(5) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains regulated constituents in excess of the applicable levels of subpart D of this part, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.

(d) Disposal of K175 wastes that have complied with all applicable 268.40 treatment standards must also be macroencapsulated in accordance with 268.45 Table 1 unless the waste is placed in:

(1) A Subtitle C monofill containing only K175 wastes that meet all applicable 268.40 treatment standards; or

(2) A dedicated Subtitle C landfill cell in which all other wastes being co-disposed are at pH 6.0.

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

268.34. Waste specific prohibitions—toxicity characteristic metal wastes.

(a) Effective August 24, 1998, the following wastes are prohibited from land disposal: the wastes specified in Part 261 as EPA Hazardous Waste numbers D004 - D011 that are newly identified (i.e. wastes, soil, or debris identified as hazardous by the Toxic Characteristic Leaching Procedure but not the Extraction Procedure), and waste, soil, or debris from mineral processing operations that is identified as hazardous by the specifications at Part 261.

(b) Effective November 26, 1998, the following waste is prohibited from land disposal: Slag from secondary lead smelting which exhibits the Toxicity Characteristic due to the presence of one or more metals.

(c) Effective May 26, 2000, the following wastes are prohibited from land disposal: newly identified characteristic wastes from elemental phosphorus processing; radioactive wastes mixed with EPA Hazardous wastes D004 - D011 that are newly identified (i.e. wastes, soil, or debris identified as hazardous by the Toxic Characteristic Leaching Procedure but not the Extraction Procedure); or mixed with newly identified characteristic mineral processing wastes, soil, or debris.

(d) Between May 26, 1998 and May 26, 2000, newly identified characteristic wastes from elemental phosphorus processing, radioactive waste mixed with D004 - D011 wastes that are newly identified (i.e. wastes, soil, or debris identified as hazardous by the Toxic Characteristic Leaching Procedure but not the Extraction Procedure), or mixed with newly identified characteristic mineral processing wastes, soil, or debris may be disposed in a landfill or surface impoundment only if such unit is in compliance with the requirements specified in 268.5(h)(2) of this part.

(e) The requirements of paragraphs (a) and (b) of this section do not apply if:

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

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

(3) The wastes meet the applicable alternate treatment standards established pursuant to a petition granted under 268.44; or

(4) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(f) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains constituents (including underlying hazardous constituents in characteristic wastes) in excess of the applicable Universal Treatment Standard levels of 268.48 of this part, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.

HISTORY: Added by State Register Volume 23, Issue No. 11, eff November 26, 1999. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

268.35. Waste specific prohibitions—petroleum refining wastes.

(a) Effective February 8, 1999, the wastes specified in part 261 as EPA Hazardous Wastes Numbers K169, K170, K171, and K172, soils and debris contaminated with these wastes, radioactive wastes mixed with these hazardous wastes, and soils and debris contaminated with these radioactive mixed wastes, are prohibited from land disposal.

(b) The requirements of paragraph (a) of this section do not apply if:

- (1) The wastes meet the applicable treatment standards specified in Subpart D of this part;
- (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition;
- (3) The wastes meet the applicable treatment standards established pursuant to a petition granted under 268.44;
- (4) Hazardous debris that have met treatment standards in 268.40 or in the alternative treatment standards in 268.45; or
- (5) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains constituents in excess of the applicable Universal Treatment Standard levels of 268.48, the waste is prohibited from land disposal, and all requirements of this part are applicable, except as otherwise specified.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

268.36. Waste specific prohibitions—inorganic chemical wastes.

(a) Effective May 20, 2002, the wastes specified in part 261 as EPA Hazardous Wastes Numbers K176, K177, and K178, and soil and debris contaminated with these wastes, radioactive wastes mixed with these wastes, and soil and debris contaminated with radioactive wastes mixed with these wastes are prohibited from land disposal.

(b) The requirements of (a) of this section do not apply if:

- (1) The wastes meet the applicable treatment standards specified in Subpart D of this part;
- (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition;
- (3) The wastes meet the applicable treatment standards established pursuant to a petition granted under 268.44;
- (4) Hazardous debris has met the treatment standards in 268.40 or the alternative treatment standards in 268.45; or
- (5) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(c) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains regulated constituents in excess of the applicable Subpart D levels, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.

HISTORY: Added by State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003.

268.37. Waste specific prohibitions—ignitable and corrosive characteristic wastes whose treatment standards were vacated.

(a) Effective August 9, 1993, the wastes specified in 261.21 as D001 (and is not in the High TOC Ignitable Liquids Subcategory), and specified in § 261.22 as D002, that are managed in systems other than those whose discharge is regulated under the Clean Water Act (CWA), or that inject in Class I

deep wells regulated under the Safe Drinking Water Act (SDWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal. CWA-equivalent treatment means biological treatment for organics, alkaline chlorination or ferrous sulfate precipitation for cyanide, precipitation/sedimentation for metals, reduction of hexavalent chromium, or other treatment technology that can be demonstrated to perform equally or greater than these technologies.

(b) Effective February 10, 1994, the wastes specified in 261.21 as D001 (and is not in the High TOC Ignitable Liquids Subcategory), and specified in § 261.22 as D002, that are managed in systems defined in 40 CFR 144.6(e) and 146.6(e) as Class V injection wells, that do not engage in CWA-equivalent treatment before injection, are prohibited from land disposal.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993.

268.38. Waste specific prohibitions—newly identified organic toxicity characteristic wastes and newly listed coke by-product and chlorotoluene production wastes.

(a) Effective December 19, 1994, the wastes specified in 261.32 as EPA Hazardous Waste numbers K141, K142, K143, K144, K145, K147, K148, K149, K150, and K151 are prohibited from land disposal. In addition, debris contaminated with EPA Hazardous Waste numbers F037, F038, K107-K112, K117, K118, K123-K126, K131, K132, K136, U328, U353, U359, and soil and debris contaminated with D012-D043, K141-K145, and K147-K151 are prohibited from land disposal. The following wastes that are specified in 261.24, Table I as EPA Hazardous Waste numbers: D012, D013, D014, D015, D016, D017, D018, D019, D020, D021, D022, D023, D024, D025, D026, D027, D028, D029, D030, D031, D032, D033, D034, D035, D036, D037, D038, D039, D040, D041, D042, D043 that are not radioactive, or that are managed in systems other than those whose discharge is regulated under the Clean Water Act (CWA), or that are zero dischargers that do not engage in CWA-equivalent treatment before ultimate land disposal, or that are injected in Class I deep wells regulated under the Safe Drinking Water Act (SDWA), are prohibited from land disposal. CWA-equivalent treatment means biological treatment for organics, alkaline chlorination or ferrous sulfate precipitation for cyanide, precipitation/ sedimentation for metals, reduction of hexavalent chromium, or other treatment technology that can be demonstrated to perform equally or better than these technologies.

(b) On September 19, 1996, radioactive wastes that are mixed with D018-D043 that are managed in systems other than those whose discharge is regulated under the Clean Water Act (CWA), or that inject in Class I deep wells regulated under the Safe Drinking Water Act (SDWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal. CWA-equivalent treatment means biological treatment for organics, alkaline chlorination or ferrous sulfate precipitation for cyanide, precipitation/ sedimentation for metals, reduction of hexavalent chromium, or other treatment technology that can be demonstrated to perform equally or greater than these technologies. Radioactive wastes mixed with K141-K145, and K147-K151 are also prohibited from land disposal. In addition, soil and debris contaminated with these radioactive mixed wastes are prohibited from land disposal.

(c) Between December 19, 1994 and September 19, 1996, the wastes included in paragraphs (b) of this section may be disposed in a landfill or surface impoundment, only if such unit is in compliance with the requirements specified in 268.5(h)(2) of this Part.

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

- (1) The wastes meet the applicable treatment standards specified in Subpart D of this part;
- (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition;
- (3) The wastes meet the applicable alternate treatment standards established pursuant to a petition granted under 268.44;
- (4) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(e) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains

constituents in excess of the applicable Subpart D levels, the waste is prohibited from land disposal, and all requirements of part 268 are applicable, except as otherwise specified.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

268.39. Waste specific prohibitions—spent aluminum potliners; reactive; and carbamate wastes.

(a) On July 8, 1996, the wastes specified in 261.32 as EPA Hazardous Waste numbers K156–K159, and K161; and in 261.33 as EPA Hazardous Waste numbers P127, P128, P185, P188–P192, P194, P196–P199, P201–P205, U271, U278–U280, U364, U367, U372, U373, U387, U389, U394, U395, U404, and U409–U411 are prohibited from land disposal. In addition, soil and debris contaminated with these wastes are prohibited from land disposal.

(b) On July 8, 1996, the wastes identified in 261.23 as D003 that are managed in systems other than those whose discharge is regulated under the Clean Water Act (CWA), or that are zero dischargers that engage in CWA-equivalent treatment before ultimate land disposal, are prohibited from land disposal. This prohibition does not apply to unexploded ordnance and other explosive devices which have been the subject of an emergency response. (Such D003 wastes are prohibited unless they meet the treatment standard of DEACT before land disposal (see 268.40)).

(c) On September 21, 1998, the wastes specified in 261.32 as EPA Hazardous Waste number K088 are prohibited from land disposal. In addition, soil and debris contaminated with these wastes are prohibited from land disposal.

(d) On April 8, 1998, radioactive wastes mixed with K088, K156–K159, K161, P127, P128, P185, P188–P192, P194, P196–P199, P201–P205, U271, U278–U280, U364, U367, U372, U373, U387, U389, U394, U395, U404, and U409–U411 are prohibited from land disposal. In addition, soil and debris contaminated with these radioactive mixed wastes are prohibited from land disposal.

(e) Between July 8, 1996, and April 8, 1998, the wastes included in paragraphs (a), (c), and (d) of this section may be disposed in a landfill or surface impoundment, only if such unit is in compliance with the requirements specified in 268.5(h)(2).

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

- (1) The wastes meet the applicable treatment standards specified in Subpart D of this part;
- (2) Persons have been granted an exemption from a prohibition pursuant to a petition under 268.6, with respect to those wastes and units covered by the petition;
- (3) The wastes meet the applicable alternate treatment standards established pursuant to a petition granted under 268.44;
- (4) Persons have been granted an extension to the effective date of a prohibition pursuant to 268.5, with respect to these wastes covered by the extension.

(g) To determine whether a hazardous waste identified in this section exceeds the applicable treatment standards specified in 268.40, the initial generator must test a sample of the waste extract or the entire waste, depending on whether the treatment standards are expressed as concentrations in the waste extract or the waste, or the generator may use knowledge of the waste. If the waste contains constituents in excess of the applicable Subpart D levels, the waste is prohibited from land disposal, and all requirements of this part 268 are applicable, except as otherwise specified.

HISTORY: Added by State Register 22, Issue No. 9, Part 2, eff September 2, 1998. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

SUBPART D
Treatment Standards

268.40. Applicability of treatment standards.

(a) A prohibited waste identified in the table “Treatment Standards for Hazardous Wastes” may be land disposed only if it meets the requirements found in the table. For each waste, the table identifies one of three types of treatment standard requirements:

- (1) All hazardous constituents in the waste or in the treatment residue must be at or below the values found in the table for that waste (“total waste standards”); or

(2) The hazardous constituents in the extract of the waste or in the extract of the treatment residue must be at or below the values found in the table (“waste extract standards”); or

(3) The waste must be treated using the technology specified in the table (“technology standard”), which are described in detail in 268.42, Table 1 -Technology Codes and Description of Technology-Based Standards.

(b) For wastewaters, compliance with concentration level standards is based on maximums for any one day, except for D004 through D011 wastes for which the previously promulgated treatment standards based on grab samples remain in effect. For all nonwastewaters, compliance with concentration level standards is based on grab sampling. For wastes covered by the waste extract standards, the test Method 1311, the Toxicity Characteristic Leaching Procedure found in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”, EPA Publication SW-846, as incorporated by reference in 260.11, must be used to measure compliance. An exception is made for D004 and D008, for which either of two test methods may be used: Method 1311, or Method 1310, the Extraction Procedure Toxicity Test. For wastes covered by a technology standard, the wastes may be land disposed after being treated using that specified technology or an equivalent treatment technology approved by the Administrator under the procedures set forth in 268.42(b).

(c) When wastes with differing treatment standards for a constituent of concern are combined for purposes of treatment, the treatment residue must meet the lowest treatment standard for the constituent of concern.

(d) Notwithstanding the prohibitions specified in paragraph (a) of this section, treatment and disposal facilities may demonstrate (and certify pursuant to 268.7(b)(5)) compliance with the treatment standards for organic constituents specified by a footnote in the table “Treatment Standards for Hazardous Wastes” in this section, provided the following conditions are satisfied:

(1) The treatment standards for the organic constituents were established based on incineration in units operated in accordance with the technical requirements of part 264, subpart O, or based on combustion in fuel substitution units operating in accordance with applicable technical requirements;

(2) The treatment or disposal facility has used the methods referenced in paragraph (d)(1) of this section to treat the organic constituents; and

(3) The treatment or disposal facility may demonstrate compliance with organic constituents if good-faith analytical efforts achieve detection limits for the regulated organic constituents that do not exceed the treatment standards specified in this section by an order of magnitude.

(e) For characteristic wastes (D001 - D043) that are subject to treatment standards in the following table “Treatment Standards for Hazardous Wastes,” and are not managed in a wastewater treatment system that is regulated under the Clean Water Act (CWA), all underlying hazardous constituents (as defined in 268.2(i)) must meet Universal Treatment Standards, found in 268.48, Table, Universal Treatment Standards, prior to land disposal, as defined in 268.2(c) of this part. (5/96, 9/98)

(f) The treatment standards for F001-F005 nonwastewater constituents carbon disulfide, cyclohexanone, and/or methanol apply to wastes which contain only one, two, or three of these constituents. Compliance is measured for these constituents in the waste extract from test Method 1311, the Toxicity Characteristic Leaching Procedure found in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods”, EPA Publication SW-846, as incorporated by reference in 260.11. If the waste contains any of these three constituents along with any of the other 25 constituents found in F001-F005, then compliance with treatment standards for carbon disulfide, cyclohexanone, and/or methanol is not required.

(g) Between August 26, 1996 and March 4, 1999 the treatment standards for the wastes specified in 261.32 as EPA Hazardous Waste numbers K156-K161; and in 261.33 as EPA Hazardous Waste numbers P127, P128, P185, P188-P192, P194, P196-P199, P201-P205, U271, U277-U280, U364-U367, U372, U373, U375-U379, U381-U387, U389-U396, U400-U404, U407, and U409-U411; and soil contaminated with these wastes; may be satisfied by either meeting the constituent concentrations presented in the table “Treatment Standards for Hazardous Wastes” in this section, or by treating the waste by the following technologies: combustion, as defined by the technology code CMBST at 268.42 Table 1, for nonwastewaters; and, biodegradation as defined by the technology code BIODG, carbon adsorption as defined by the technology code CARBN, chemical oxidation as defined by the technology

code CHOXD, or combustion as defined as technology code CMBST at 268.42 Table 1, for wastewaters.

(h) Prohibited D004-D011 mixed radioactive wastes and mixed radioactive listed wastes containing metal constituents, that were previously treated by stabilization to the treatment standards in effect at that time and then put into storage, do not have to be re-treated to meet treatment standards in this section prior to land disposal.

(i) [Reserved]

(j) Effective September 4, 1998, the treatment standards for the wastes specified in 40 CFR 261.33 as EPA Hazardous Waste numbers P185, P191, P192, P197, U364, U394, and U395 may be satisfied by either meeting the constituent concentrations presented in the table “Treatment Standards for Hazardous Wastes” in this section, or by treating the waste by the following technologies: combustion, as defined by the technology code CMBST at 268.42 Table 1 of this Part, for nonwastewaters; and, biodegradation as defined by the technology code BIODG, carbon adsorption as defined by the technology code CARBN, chemical oxidation as defined by the technology code CHOXD, or combustion as defined as technology code CMBST at 268.42 Table 1 of this Part, for wastewaters.

Table 268.40—Treatment Standards for Hazardous Wastes

Note: The treatment standards that heretofore appeared in tables in 268.41, 268.42, and 268.43 of this part have been consolidated into the table “Treatment Standards for Hazardous Wastes” in this section.

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
D001 ⁹	Ignitable Characteristic Wastes, except for the 261.21(a)(1) High TOC Subcategory.	NA	NA	DEACT and meet 268.48 standards ⁸ ; or RORGS; or CMBST	DEACT and meet 268.48 standards ⁸ ; or RORGS; or CMBST
	High TOC Ignitable Characteristic Liquids Subcategory based on 261.21(a)(1) – Greater than or equal to 10% total organic carbon. (Note: This subcategory consists of nonwastewaters only.)	NA	NA	NA	RORGS; CMBST; or POLYM
D002 ⁹	Corrosive Characteristic Wastes.	NA	NA	DEACT and meet 268.48 standards ⁸	DEACT and meet 268.48 standards ⁸
D002, D004, D005, D006, D007, D008, D009, D010, D011	Radioactive high level wastes generated during the reprocessing of fuel rods. (Note: This subcategory consists of nonwastewaters only.)	Corrosivity (pH)	NA	NA	HLVIT
		Arsenic	7440-38-2	NA	HLVIT
		Barium	7440-39-3	NA	HLVIT
		Cadmium	7440-43-9	NA	HLVIT
		Chromium (Total)	7440-47-3	NA	HLVIT
		Lead	7439-92-1	NA	HLVIT
		Mercury	7439-97-6	NA	HLVIT
		Selenium	7782-49-2	NA	HLVIT
D003 ⁹	Reactive Sulfides Subcategory based on 261.23(a)(5)	NA	NA	DEACT	DEACT
	Explosives Subcategory based on 261.23(a)(6), (7), and (8)	NA	NA	DEACT and meet 268.48 standards ⁸	DEACT and meet 268.48 standards ⁸
	Unexploded ordnance and other explosive devices which have been the subject of an emergency response.	NA	NA	DEACT	DEACT
	Other Reactives Subcategory based on 261.23(a)(1).	NA	NA	DEACT and meet 268.48 standards ⁸	DEACT and meet 268.48 standards ⁸
	Water Reactive Subcategory based on 261.23(a)(2), (3), and (4). (Note: This subcategory consists of nonwastewaters only.)	NA	NA	NA	DEACT and meet 268.48 standards ⁸
	Reactive Cyanides Subcategory based on 261.23(a)(5).	Cyanides (Total) ⁷	57-12-5	Reserved	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
D004 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for arsenic based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Arsenic	7440-38-2	1.4 and meet 268.48 standards ⁸	5.0 mg/l TCLP and meet 268.48 standards ⁸

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
D005 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for barium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Barium	7440-39-3	1.2 and meet 268.48 standards ⁸	21 mg/l TCLP and meet 268.48 standards ⁸
D006 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for cadmium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Cadmium	7440-43-9	0.69 and meet 268.48 standards ⁸	0.11 mg/l TCLP and meet 268.48 standards ⁸
	Cadmium Containing Batteries Subcategory. (Note: This subcategory consists of nonwastewaters only.)	Cadmium	7440-43-9	NA	RTHRM
	Radioactively contaminated cadmium containing batteries. (Note: This subcategory consists of nonwastewaters only) (6/04)	Cadmium	7440-43-9	NA	Macroencapsulation in accordance with 268.45
D007 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for chromium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Chromium (Total)	7440-47-3	2.77 and meet 268.48 standards ⁸	0.60 mg/l TCLP and meet 268.48 standards ⁸
D008 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for lead based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Lead	7439-92-1	0.69 and meet 268.48 standards ⁸	0.75 mg/l TCLP and meet 268.48 standards ⁸
	Lead Acid Batteries Subcategory (Note: This standard only applies to lead acid batteries that are identified as RCRA hazardous wastes and that are not excluded elsewhere from regulation under the land disposal restrictions of 268 or exempted under other EPA regulations (see 266.80). This subcategory consists of nonwastewaters only.)	Lead	7439-92-1	NA	RLEAD
	Radioactive Lead Solids Subcategory (Note: these lead solids include, but are not limited to, all forms of lead shielding and other elemental forms of lead. These lead solids do not include treatment residuals such as hydroxide sludges, other wastewater treatment residuals, or incinerator ashes that can undergo conventional pozzolanic stabilization, nor do they include organo-lead materials that	Lead	7439-92-1	NA	MACRO

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	can be incinerated and stabilized as ash. This subcategory consists of nonwastewaters only.)				
D009 ⁹	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that also contain organics and are not incinerator residues. (High Mercury-Organic Subcategory)	Mercury	7439-97-6	NA	IMERC; OR RMERC
	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain greater than or equal to 260 mg/kg total mercury that are inorganic, including incinerator residues and residues from RMERC. (High Mercury-Inorganic Subcategory)	Mercury	7439-97-6	NA	RMERC
	Nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are residues from RMFRC only. (Low Mercury Subcategory)	Mercury	7439-97-6	NA	0.20 mg/l TCLP and meet 268.48 standards ⁸
	All other nonwastewaters that exhibit, or are expected to exhibit, the characteristic of toxicity for mercury based on the toxicity characteristic leaching procedure (TCLP) in SW846; and contain less than 260 mg/kg total mercury and that are not residues from RMERC. (Low Mercury Subcategory)	Mercury	7439-97-6	NA	0.025 mg/l TCLP and meet 268.48 standards ⁸
	All D009 wastewaters.	Mercury	7439-97-6	0.15 and meet 268.48 standards ⁸	NA
	Elemental mercury contaminated with radioactive materials. (Note: This subcategory consists of nonwastewaters only.)	Mercury	7439-97-6	NA	AMLGM
	Hydraulic oil contaminated with Mercury Radioactive Materials Subcategory. (Note: This subcategory consists of nonwastewaters only.)	Mercury	7439-97-6	NA	IMERC

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	Radioactively contaminated mercury containing batteries. (Note: This subcategory consists of nonwastewaters only) (6/04)	Mercury	7439-97-6	NA	Macroencapsulation in accordance with 268.45
D010 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for selenium based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Selenium	7782-49-2	0.82 and meet 268.48 standards ⁸	5.7 mg/l TCLP and meet 268.48 standards ⁸
	Radioactively contaminated silver containing batteries. (Note: This subcategory consists of nonwastewaters only) (6/04)	Silver	7440-22-4	NA	Macroencapsulation in accordance with 268.45
D011 ⁹	Wastes that exhibit, or are expected to exhibit, the characteristic of toxicity for silver based on the toxicity characteristic leaching procedure (TCLP) in SW846.	Silver	7440-22-4	0.43 and meet 268.48 standards ⁸	0.14 mg/l TCLP and meet 268.48 standards ⁸
D012 ⁹	Wastes that are TC for Endrin based on the TCLP in SW846 Method 1311.	Endrin	72-20-8	BIODG; or CMBST	0.13 and meet 268.48 standards ⁸
		Endrin aldehyde	7421-93-4	BIODG; or CMBST	0.13 and meet 268.48 standards ⁸
D013 ⁹	Wastes that are TC for Lindane based on the TCLP in SW846 Method 1311.	alpha-BHC	319-84-6	CARBON; or CMBST	0.066 and meet 268.48 standards ⁸
		beta-BHC	319-85-7	CARBON; or CMBST	0.066 and meet 268.48 standards ⁸
		delta-BHC	319-86-8	CARBON; or CMBST	0.066 and meet 268.48 standards ⁸
		gamma-BHC (Lindane)	58-89-9	CARBON; or CMBST	0.066 and meet 268.48 standards ⁸
D014 ⁹	Wastes that are TC for Methoxychlor based on the TCLP in SW846 Method 1311.	Methoxychlor	72-43-5	WETOX or CMBST	0.18 and meet 268.48 standards ⁸
D015 ⁹	Wastes that are TC for Toxaphene based on the TCLP in SW846 Method 1311.	Toxaphene	8001-35-2	BIODG or CMBST	2.6 and meet 268.48 standards ⁸
D016 ⁹	Wastes that are TC for 2,4-D (2,4-Dichlorophenoxyacetic acid) based on the TCLP in SW846 Method 1311.	2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7	CHOXD, BIODG, or CMBST	10 and meet 268.48 standards ⁸
D017 ⁹	Wastes that are TC for 2,4,5-TP (Silvex) based on the TCLP in SW846 Method 1311.	2,4,5-TP (Silvex)	93-72-1	CHOXD or CMBST	7.9 and meet 268.48 standards ⁸

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ¹
D018 ⁹	Wastes that are TC for Benzene based on the TCLP in SW846 Method 1311.	Benzene	71-43-2	0.14 and meet 268.48 standards ⁸	10 and meet 268.48 standards ⁸
D019 ⁹	Wastes that are TC for Carbon tetrachloride based on the TCLP in SW846 Method 1311.	Carbon tetrachloride	56-23-5	0.057 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D020 ⁹	Wastes that are TC for Chlordane based on the TCLP in SW846 Method 1311.	Chlordane (alpha and gamma isomers)	57-74-9	0.0033 and meet 268.48 standards ⁸	0.26 and meet 268.48 standards ⁸
D021 ⁹	Wastes that are TC for Chlorobenzene based on the TCLP in SW846 Method 1311.	Chlorobenzene	108-90-7	0.057 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D022 ⁹	Wastes that are TC for Chloroform based on the TCLP in SW846 Method 1311.	Chloroform	67-66-3	0.046 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D023 ⁹	Wastes that are TC for o-Cresol based on the TCLP in SW846 Method 1311.	o-Cresol	95-48-7	0.11 and meet 268.48 standards ⁸	5.6 and meet 268.48 standards ⁸
D024 ⁹	Wastes that are TC for m-Cresol based on the TCLP in SW846 Method 1311.	m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77 and meet 268.48 standards ⁸	5.6 and meet 268.48 standards ⁸
D025 ⁹	Wastes that are TC for p-Cresol based on the TCLP in SW846 Method 1311.	p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77 and meet 268.48 standards ⁸	5.6 and meet 268.48 standards ⁸
D026 ⁹	Wastes that are TC for Cresols (Total) based on the TCLP in SW846 Method 1311.	Cresol-mixed isomers (Cresylic acid) (sum o-, m-, and p-cresol concentrations)	1319-77-3	0.88 and meet 268.48 standards ⁸	11.2 and meet 268.48 standards ⁸
D027 ⁹	Wastes that are TC for p-Dichlorobenzene based on the TCLP in SW846 Method 1311.	p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	0.090 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D028 ⁹	Wastes that are TC for 1,2-Dichloroethane based on the TCLP in SW846 Method 1311.	1,2-Dichloroethane	107-06-2	0.21 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D029 ⁹	Wastes that are TC for 1,1-Dichloroethylene based on the TCLP in SW846 Method 1311.	1,1-Dichloroethylene	75-35-4	0.025 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D030 ⁹	Wastes that are TC for 2,4-Dinitrotoluene based on the TCLP in SW846 Method 1311.	2,4-Dinitrotoluene	121-14-2	0.32 and meet 268.48 standards ⁸	140 and meet 268.48 standards ⁸
D031 ⁹	Wastes that are TC for Heptachlor based on the TCLP in SW846 Method 1311.	Heptachlor	76-44-8	0.0012 and meet 268.48 standards ⁸	0.066 and meet 268.48 standards ⁸
		Heptachlor epoxide	1024-57-3	0.016 and meet 268.48 standards ⁸	0.066 and meet 268.48 standards ⁸
D032 ⁹	Wastes that are TC for Hexachlorobenzene based on the TCLP in SW846 Method 1311.	Hexachlorobenzene	118-74-1	0.055 and meet 268.48 standards ⁸	10 and meet 268.48 standards ⁸
D033 ⁹	Wastes that are TC for Hexachlorobutadiene based on the TCLP in SW846 Method 1311.	Hexachlorobutadiene	87-68-3	0.055 and meet 268.48 standards ⁸	5.6 and meet 268.48 standards ⁸

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
D034 ⁹	Wastes that are TC for Hexachloroethane based on the TCLP in SW846 Method 1311.	Hexachloroethane	67-72-1	0.055 and meet 268.48 standards ⁸	30 and meet 268.48 standards ⁸
D035 ⁹	Wastes that are TC for Methyl ethyl ketone based on the TCLP in SW846 Method 1311.	Methyl ethyl ketone	78-93-3	0.28 and meet 268.48 standards ⁸	36 and meet 268.48 standards ⁸
D036 ⁹	Wastes that are TC for Nitrobenzene based on the TCLP in SW846 Method 1311.	Nitrobenzene	98-95-3	0.068 and meet 268.48 standards ⁸	14 and meet 268.48 standards ⁸
D037 ⁹	Wastes that are TC for Pentachlorophenol based on the TCLP in SW846 Method 1311.	Pentachlorophenol	87-86-5	0.089 and meet 268.48 standards ⁸	7.4 and meet 268.48 standards ⁸
D038 ⁹	Wastes that are TC for Pyridine based on the TCLP in SW846 Method 1311.	Pyridine	110-86-1	0.014 and meet 268.48 standards ⁸	16 and meet 268.48 standards ⁸
D039 ⁹	Wastes that are TC for Tetrachloroethylene based on the TCLP in SW846 Method 1311.	Tetrachloroethylene	127-18-4	0.056 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D040 ⁹	Wastes that are TC for Trichloroethylene based on the TCLP in SW846 Method 1311.	Trichloroethylene	79-01-6	0.054 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
D041 ⁹	Wastes that are TC for 2,4,5-Trichlorophenol based on the TCLP in SW846 Method 1311.	2,4,5-Trichlorophenol	95-95-4	0.18 and meet 268.48 standards ⁸	7.4 and meet 268.48 standards ⁸
D042 ⁹	Wastes that are TC for 2,4,6-Trichlorophenol based on the TCLP in SW846 Method 1311.	2,4,6-Trichlorophenol	88-06-2	0.035 and meet 268.48 standards ⁸	7.4 and meet 268.48 standards ⁸
D043 ⁹	Wastes that are TC for Vinyl chloride based on the TCLP in SW846 Method 1311.	Vinyl chloride	75-01-4	0.27 and meet 268.48 standards ⁸	6.0 and meet 268.48 standards ⁸
F001, F002, F003, F004, & F005	F001, F002, F003, F004 and/or F005 solvent wastes that contain any combination of one or more of the following spent solvents: acetone, benzene, n-butyl alcohol, carbon disulfide, carbon tetrachloride, chlorinated fluorocarbons, chlorobenzene, o-cresol, m-cresol, p-cresol, cyclohexanone, o-dichlorobenzene, 2-ethoxyethanol, ethyl acetate, ethyl benzene, ethyl ether, isobutyl alcohol, methanol, methylene chloride, methyl ethyl ketone, methyl isobutyl ketone, nitrobenzene, 2-nitropropane, pyridine, tetrachloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, 1,1,2-trichloro-1,2,2-trifluoroethane, trichloroethylene,	Acetone	67-64-1	0.28	160
		Benzene	71-43-2	0.14	10
		n-Butyl alcohol	71-36-3	5.6	2.6
		Carbon disulfide	75-15-0	3.8	NA
		Carbon tetrachloride	56-23-5	0.057	6.0
		Chlorobenzene	108-90-7	0.057	6.0
		o-Cresol	95-48-7	0.11	5.6
		m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
		p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
		Cresol-mixed isomers (Cresylic acid)(sum of o-, m-, and p-cresol concentrations)	1319-77-3	0.88	11.2
		Cyclohexanone	108-94-1	0.36	NA
		o-Dichlorobenzene	95-50-1	0.088	6.0
		Ethyl acetate	141-78-6	0.34	33
		Ethyl benzene	100-41-4	0.057	10
		Ethyl ether	60-29-7	0.12	160
		Isobutyl alcohol	78-83-1	5.6	170
		Methanol	67-56-1	5.6	NA
Methylene chloride	75-9-2	0.089	30		

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters	
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴	
	trichloromonofluoromethane, and/or xylenes [except as specifically noted in other subcategories]. See further details of these listings in 261.31.	Methyl ethyl ketone	78-93-3	0.28	36	
		Methyl isobutyl ketone	108-10-1	0.14	33	
		Nitrobenzene	98-95-3	0.068	14	
		Pyridine	110-86-1	0.014	16	
		Tetrachloroethylene	127-18-4	0.056	6.0	
		Toluene	108-88-3	0.080	10	
		1,1,1-Trichloroethane	71-55-6	0.054	6.0	
		1,1,2-Trichloroethane	79-00-5	0.054	6.0	
		1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.057	30	
		Trichloroethylene	79-01-6	0.054	6.0	
		Trichloromonofluoromethane	75-69-4	0.020	30	
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30	
		F003 and/or F005 solvent wastes that contain any combination of one or more of the following three solvents as the only listed F001-5 solvents: carbon disulfide, cyclohexanone, and/or methanol. (formerly 268.41(c))	Carbon disulfide	75-15-0	3.8	4.8 mg/l TCLP
			Cyclohexanone	108-94-1	0.36	0.75 mg/l TCLP
			Methanol	67-56-1	5.6	0.75 mg/l TCLP
F005 solvent waste containing 2-Nitropropane as the only listed F001-5 solvent.	2-Nitropropane	79-46-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST		
F005 solvent waste containing 2-Ethoxyethanol as the only listed F001-5 solvent.	2-Ethoxyethanol	110-80-5	BIODG; or CMBST	CMBST		
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) Sulfuric acid anodizing of aluminum; (2) tin plating on carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-aluminum plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.	Cadmium	7440-43-9	0.69	0.11 mg/l TCLP	
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP	
		Cyanides (Total) ⁷	57-12-5	1.2	590	
		Cyanides (Amenable) ⁷	57-12-5	0.86	30	
		Lead	7439-92-1	0.69	0.75 mg/l TCLP	
		Nickel	7440-02-0	3.98	11 mg/l TCLP	
		Silver	7440-22-4	NA	0.14 mg/l TCLP	
F007	Spent cyanide plating bath solutions from electroplating operations.	Cadmium	7440-43-9	NA	0.11 mg/l TCLP	
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP	
		Cyanides (Total) ⁷	57-12-5	1.2	590	
		Cyanides (Amenable) ⁷	57-12-5	0.86	30	
		Lead	7439-92-1	0.69	0.75 mg/l TCLP	
		Nickel	7440-02-0	3.98	11 mg/l TCLP	
		Silver	7440-22-4	NA	0.14 mg/l TCLP	

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.	Cadmium	7440-43-9	NA	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Silver	7440-22-4	NA	0.14 mg/l TCLP
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.	Cadmium	7440-43-9	NA	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Silver	7440-22-4	NA	0.14 mg/l TCLP
F010	Quenching bath residues from oil baths from metal heat treating operations where cyanides are used in the process.	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	NA
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.	Cadmium	7440-43-9	NA	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Silver	7440-22-4	NA	0.11 mg/l TCLP
F012	Quenching wastewater treatment sludges from metal heat treating operations where cyanides are used in the process.	Cadmium	7440-43-9	NA	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Silver	7440-22-4	NA	0.14 mg/l TCLP
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum can	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters		
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴		
F020, F021, F022, F023, F026	Wastes (except wastewater and spent carbon from hydrogen chloride purification) from the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of: (1) tri- or tetrachlorophenol, or of intermediates used to produce their pesticide derivatives, excluding wastes from the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol (F020); (2) pentachlorophenol, or of intermediates used to produce its derivatives (i.e., F021); (3) tetra-, penta-, or hexachlorobenzenes under alkaline conditions (i.e., F022); and from the production of materials on equipment previously used for the production or manufacturing use (as a reactant, chemical intermediate, or component in a formulating process) of: (1) tri-, or tetrachlorophenols, excluding wastes from equipment used only for the production of Hexachlorophene from highly purified 2,4,5-trichlorophenol (F023); (2) tetra-, penta-, or hexachlorobenzenes under alkaline conditions (i.e., F026).	HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001		
		HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001		
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001		
		PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001		
		Pentachlorophenol	87-86-5	0.089	7.4		
		TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001		
		TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001		
		2,4,5-Trichlorophenol	95-95-4	0.18	7.4		
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4		
		2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4		
		F024	Process wastes, including but not limited to, distillation residues, heavy ends, tars, and reactor clean-out wastes, from the production of certain chlorinated aliphatic hydrocarbons by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. (This listing does not include wastewaters, wastewater treatment sludges, spent catalysts, and wastes listed in 261.31 or 261.32.)	All F024 wastes	NA	CMBST ¹¹	CMBST ¹¹
				2-Chloro-1,3-butadiene	126-99-8	0.057	0.28
3-Chloropropylene	107-05-1			0.036	30		
1,1-Dichloroethane	75-34-3			0.059	6.0		
1,2-Dichloroethane	107-06-2			0.21	6.0		
1,2-Dichloroethane	78-87-5			0.85	18		
cis-1,3-Dichloropropylene	10061-01-5			0.036	18		
trans-1,3-Dichloropropylene	10061-02-6			0.036	18		
bis(2-Ethylhexyl) phthalate	117-81-7			0.28	28		
Hexachloroethane	67-72-1			0.055	30		
Chromium (Total)	7440-47-3			2.77	0.60 mg/l TCLP		
Nickel	7440-02-0			3.98	11 mg/l TCLP		
F025	Condensed light ends from the production of certain chlorinated			Carbon tetrachloride	56-23-5	0.057	6.0
				Chloroform	67-66-3	0.046	6.0

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters	
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴	
	aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. F025-Light Ends Subcategory	1,2-Dichloroethane	107-06-2	0.21	6.0	
		1,1-Dichloroethylene	75-35-4	0.025	6.0	
		Methylene chloride	75-9-2	0.089	30	
		1,1,2-Trichloroethane	79-00-5	0.054	6.0	
		Trichloroethylene	79-01-6	0.054	6.0	
		Vinyl chloride	75-01-4	0.27	6.0	
		Spent filters and filter aids, and spent desiccant wastes from the production of certain chlorinated aliphatic hydrocarbons, by free radical catalyzed processes. These chlorinated aliphatic hydrocarbons are those having carbon chain lengths ranging from one to and including five, with varying amounts and positions of chlorine substitution. F025-Spent Filters/Aids and Desiccants Subcategory	Carbon tetrachloride	56-23-5	0.057	6.0
			Chloroform	67-66-3	0.046	6.0
			Hexachlorobenzene	118-74-1	0.055	10
			Hexachlorobutadiene	87-68-3	0.055	5.6
			Hexachloroethane	67-72-1	0.055	30
			Methylene chloride	75-9-2	0.089	30
			1,1,2-Trichloroethane	79-00-5	0.054	6.0
			Trichloroethylene	79-01-6	0.054	6.0
Vinyl chloride	75-01-4		0.27	6.0		
F027	Discarded unused formulations containing tri-, tetra-, or pentachlorophenol or discarded unused formulations containing compounds derived from these chlorophenols. (This listing does not include formulations containing hexachlorophene synthesized from prepurified 2,4,5-trichlorophenol as the sole component.)		HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001	
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001	
		PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001	
		Pentachlorophenol	87-86-5	0.089	7.4	
		TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001	
		TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001	
		2,4,5-Trichlorophenol	95-95-4	0.18	7.4	
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4	
		2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4	
		F028	Residues resulting from the incineration or thermal treatment of soil contaminated with EPA Hazardous Wastes Nos. F020, F021, F023, F026, and F027.	HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063
HxCDFs (All Hexachlorodibenzofurans)	NA			0.000063	0.001	
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA			0.000063	0.001	
PeCDFs (All Pentachlorodibenzofurans)	NA			0.000035	0.001	
Pentachlorophenol	87-86-5			0.089	7.4	
TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA			0.000063	0.001	
TCDFs (All Tetrachlorodibenzofurans)	NA			0.000063	0.001	
2,4,5-Trichlorophenol	95-95-4			0.18	7.4	
2,4,6-Trichlorophenol	88-06-2			0.035	7.4	
2,3,4,6-Tetrachlorophenol	58-90-2			0.030	7.4	
F032	Wastewaters (except those that have not come into contact with process contaminants), process residuals,			Acenaphthene	83-32-9	0.059
		Anthracene	120-12-7	0.059	3.4	
		Benz(a)anthracene	56-55-3	0.059	3.4	

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	preservative drippage, and spent formulations from wood preserving processes generated at plants that currently use or have previously used chlorophenolic formulations (except potentially cross-contaminated wastes that have had the F032 waste code deleted in accordance with 261.35 of this chapter or sediment sludge from the treatment of wastewater from wood preserving processes that use potentially cross-contaminated wastes that are otherwise currently regulated as hazardous wastes (i.e., F034 or F035), and where the generator does not resume or initiate use of chlorophenolic formulations). This listing does not include K001 bottom creosote and/or penta-chlorophenol.	Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
		2,4-Dimethyl phenol	105-67-9	0.036	14
		Fluorene	86-73-7	0.059	3.4
		Hexachlorodibenzo-p-dioxins	NA	0.000063, or CMBST ¹¹	0.001, or CMBST ¹¹
		Hexachlorodibenzofurans	NA	0.000063, or CMBST ¹¹	0.001, or CMBST ¹¹
		Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4
		Naphthalene	91-20-3	0.059	5.6
		Pentachlorodibenzo-p-dioxins	NA	0.000063, or CMBST ¹¹	0.001, or CMBST ¹¹
		Pentachlorodibenzofurans	NA	0.000035, or CMBST ¹¹	0.001, or CMBST ¹¹
		Pentachlorophenol	87-86-5	0.089	7.4
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
		Tetrachlorodibenzo-p-dioxins	NA	0.000063, or CMBST ¹¹	0.001, or CMBST ¹¹
		Tetrachlorodibenzofurans	NA	0.000063, or CMBST ¹¹	0.001, or CMBST ¹¹
		2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
F034	Wastewaters (except those that have not come into contact with process contaminants), process residuals, preservative drippage, and spent formulations from wood preserving processes generated at plants that use creosote formulations. This listing does not include K001 bottom sediment sludge from the treatment of wastewater from wood preserving processes that use creosote and/or pentachlorophenol.	Acenaphthene	83-32-9	0.059	3.4
		Anthracene	120-12-7	0.059	3.4
		Benzo(a)anthracene	56-55-3	0.059	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
		Fluorene	86-73-7	0.059	3.4
		Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Pyrene	129-00-0	0.067	8.2
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
F035	Wastewaters (except those that have not come into contact with process contaminants), process residuals,	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
F037	Petroleum refinery primary oil/water/solids separation sludge-Any sludge generated from the gravitational separation of oil/water/solids during the storage or treatment of process wastewaters and oily cooling wastewaters from petroleum refineries. Such sludges include, but are not limited to, those generated in: oil/water/solids separators; tanks and impoundments; ditches and other conveyances; sumps; and stormwater units receiving dry weather flow. Sludge generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges generated in aggressive biological treatment units as define in 261.31(b)(2) (including sludges generated in one or more additional units after wastewaters have been treated in aggressive biological treatment units) and K051 wastes are not included in this listing.	Acenaphthene	83-32-9	0.059	NA
		Anthracene	120-12-7	0.059	3.4
		Benzene	71-43-2	0.14	10
		Benzo(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		Chrysene	218-01-9	0.059	3.4
		Di-n-butyl phthalate	84-74-2	0.057	28
		Ethylbenzene	100-41-4	0.057	10
		Fluorene	86-73-7	0.059	NA
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-3	0.080	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Lead	7439-92-1	0.69	NA
		Nickel	7440-02-0	NA	11 mg/l TCLP
		F038	Petroleum refinery secondary (emulsified) oil/water/solids separation sludge and/or float generated from the physical and/or chemical separation of oil/water/solids in process wastewaters and oily cooling wastewaters from petroleum refineries. Such wastes include, but are not limited to, all sludges and floats generated in: induced air flotation (IAF) units, tanks and	Benzene	71-43-2
Benzo(a)pyrene	50-32-8			0.061	3.4
bis(2-Ethylhexyl) phthalate	117-81-7			0.28	28
Chrysene	218-01-9			0.059	3.4
Di-n-butyl phthalate	84-74-2			0.057	28
Ethylbenzene	100-41-4			0.057	10
Fluorene	86-73-7			0.059	NA
Naphthalene	91-20-3			0.059	5.6
Phenanthrene	85-01-8			0.059	5.6
Phenol	108-95-2			0.039	6.2
Pyrene	129-00-0			0.067	8.2
Toluene	108-88-3	0.080	10		

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters	
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴	
	impoundments, and all sludges generated in DAF units. Sludges generated in stormwater units that do not receive dry weather flow, sludges generated from non-contact once-through cooling waters segregated for treatment from other process or oily cooling waters, sludges and floats generated in aggressive biological treatment units as defined in 261.31(b)(2) (including sludges and floats generated in one or more additional units after wastewaters have been treated in aggressive biological units) and F037, K048, and K051 are not included in this listing.	Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30	
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP	
		Cyanides (Total) ⁷	57-12-5	1.2	590	
		Lead	7439-92-1	0.69	NA	
		Nickel	7440-02-0	NA	11 mg/l TCLP	
F039	Leachate (liquids that have percolated through land disposed wastes) resulting from the disposal of more than one restricted waste classified as hazardous under subpart D of this part. (Leachate resulting from the disposal of one or more of the following EPA Hazardous Wastes and no other Hazardous Wastes retains its EPA Hazardous Waste Number(s): F020, F021, F022, F026, F027, and/or F028). (6/02, 2/07)	Acenaphthylene	208-96-8	0.059	3.4	
		Acenaphthene	83-32-9	0.059	3.4	
		Acetone	67-64-1	0.28	160	
		Acetonitrile	75-05-8	5.6	NA	
		Acetophenone	96-86-2	0.010	9.7	
		2-Acetylaminofluorene	53-96-3	0.059	140	
		Acrolein	107-02-8	0.29	NA	
		Acrylonitrile	107-13-1	0.24	84	
		Aldrin	309-00-2	0.021	0.066	
		4-Aminobiphenyl	92-67-1	0.13	NA	
		Aniline	62-53-3	0.81	14	
		o-Anisidine (2-methoxyaniline)	90-04-0	0.010	0.66	
		Anthracene	120-12-7	0.059	3.4	
		Aramite	140-57-8	0.36	NA	
		alpha-BHC	319-84-6	0.00014	0.066	
		beta-BHC	319-85-7	0.00014	0.066	
		delta-BHC	319-86-8	0.023	0.066	
		gamma-BHC	58-89-9	0.0017	0.066	
		Benzene	71-43-2	0.14	10	
		Benzo(a)anthracene	56-55-3	0.059	3.4	
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8	
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8	
		Benzo(g,h,i)perylene	191-24-2	0.0055	1.8	
		Benzo(a)pyrene	50-32-8	0.061	3.4	
		Bromodichloromethane	75-27-4	0.35	15	
		Methyl bromide (Bromomethane)	74-83-9	0.11	15	
		4-Bromophenyl phenyl ether	101-55-3	0.055	15	
		n-Butyl alcohol	71-36-3	5.6	2.6	
		Butyl benzyl phthalate	85-68-7	0.017	28	
		2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	88-85-7	0.066	2.5	
		Carbon disulfide	75-15-0	3.8	NA	
		Carbon tetrachloride	56-23-5	0.057	6.0	
		Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26	
p-Chloroaniline	106-47-8	0.46	16			

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Chlorobenzene	108-90-7	0.057	6.0
		Chlorobenzilate	510-15-6	0.10	NA
		2-Chloro-1,3-butadiene	126-99-8	0.057	NA
		Chlorodibromomethane	124-48-1	0.057	15
		Chloroethane	75-00-3	0.27	6.0
		bis(2-Chloroethoxy)methane	111-91-1	0.036	7.2
		bis(2-Chloroethyl)ether	111-44-4	0.033	6.0
		Chloroform	67-66-3	0.046	6.0
		bis(2-Chloroisopropyl)ether	69638-32-9	0.055	7.2
		p-Chloro-m-cresol	59-50-7	0.018	14
		Chloromethane (Methyl chloride)	74-87-3	0.19	30
		2-Chloronaphthalene	91-58-7	0.055	5.6
		2-Chlorophenol	95-57-8	0.044	5.7
		3-Chloropropylene	107-05-1	0.036	30
		Chrysene	218-01-9	0.059	3.4
		o-Cresol	95-48-7	0.11	5.6
		p-Cresidine	120-71-8	0.010	0.66
		m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
		p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
		Cyclohexanone	108-94-1	0.36	NA
		1,2-Dibromo-3-chloropropane	96-12-8	0.11	15
		Ethylene dibromide (1,2-Dibromomethane)	106-93-4	0.028	15
		Dibromomethane	74-95-3	0.11	15
		2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7	0.72	10
		o,p'-DDD	53-19-0	0.023	0.087
		p,p'-DDD	72-54-8	0.023	0.087
		o, p'-DDE	3424-82-6	0.031	0.087
		p,p'-DDE	72-55-9	0.031	0.087
		o,p'-DDT	789-02-6	0.0039	0.087
		p,p'-DDT	50-29-3	0.0039	0.087
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
		Dibenz(a,e)pyrene	192-65-4	0.061	NA
		m-Dichlorobenzene	541-73-1	0.036	6.0
		o-Dichlorobenzene	95-50-1	0.088	6.0
		p-Dichlorobenzene	106-46-7	0.090	6.0
		Dichlorodifluoromethane	75-71-8	0.23	7.2
		1,1-Dichloroethane	75-34-3	0.059	6.0
		1,2-Dichloroethane	107-06-2	0.21	6.0
		1,1-Dichloroethylene	75-35-4	0.025	6.0
		trans-1,2-Dichloroethylene	156-60-5	0.054	30
		2,4-Dichlorophenol	120-83-2	0.044	14
		2,6-Dichlorophenol	87-65-0	0.044	14
		1,2-Dichloropropane	78-87-5	0.85	18
		cis-1,3-Dichloropropylene	10061-01-5	0.036	18
		trans-1,3-Dichloropropylene	10061-02-6	0.036	18
		Dieldrin	60-57-1	0.017	0.13
		Diethyl phthalate	84-66-2	0.20	28
		2,4-Dimethylaniline (2,4-xylidine)	95-68-1	0.010	0.66
		2,4-Dimethyl phenol	105-67-9	0.036	14

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Dimethyl phthalate	131-11-3	0.047	28
		Di-n-butyl phthalate	84-74-2	0.057	28
		1,4-Dinitrobenzene	100-25-4	0.32	2.3
		4,6-Dinitro-o-cresol	534-52-1	0.28	160
		2,4-Dinitrophenol	51-28-5	0.12	160
		2,4-Dinitrotoluene	606-20-2	0.55	28
		Di-n-octyl phthalate	117-84-0	0.017	28
		Di-n-propylnitrosamine	621-64-7	0.40	14
		1,4-Dioxane	123-91-1	12.0	170
		Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	0.92	NA
		Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	NA
		1,2-Diphenylhydrazine	122-66-7	0.087	NA
		Disulfoton	298-04-4	0.017	6.2
		Endosulfan I	939-98-8	0.023	0.066
		Endosulfan II	33213-6-5	0.029	0.13
		Endosulfan sulfate	1031-07-8	0.029	0.13
		Endrin	72-20-8	0.0028	0.13
		Endrin aldehyde	7421-93-4	0.025	0.13
		Ethyl acetate	141-78-6	0.34	33
		Ethyl cyanide (Propanenitrile)	107-12-0	0.24	360
		Ethyl benzene	100-41-4	0.057	10
		Ethyl ether	60-29-7	0.12	160
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		Ethyl methacrylate	97-63-2	0.14	160
		Ethylene oxide	75-21-8	0.12	NA
		Famphur	52-85-7	0.017	15
		Fluoranthene	206-44-0	0.068	3.4
		Fluorene	86-73-7	0.059	3.4
		Heptachlor	76-44-8	0.0012	0.066
		1, 2, 3, 4, 6, 7, 8-Heptachlorodibenzo-p-dioxin (1, 2, 3, 4, 6, 7, 8 HpCDD) (6/02)	65822-46-9	0.000035	0.0025
		1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF) (6/02)	67562-39-4	0.000035	0.0025
		1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF) (6/02)	55673-89-7	0.000035	0.0025
		Heptachlor epoxide	1024-57-3	0.016	0.066
		Hexachlorobenzene	118-74-1	0.055	10
		Hexachlorobutadiene	87-68-3	0.055	5.6
		Hexachlorocyclopentadiene	77-47-4	0.057	2.4
		HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
		Hexachloroethane	67-72-1	0.055	30
		Hexachloropropylene	1888-71-7	0.035	30
		Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4
		Iodomethane	74-88-4	0.19	65
		Isobutyl alcohol	78-83-1	5.6	170
		Isodrin	465-73-6	0.021	0.066
		Isosafrole	120-58-1	0.081	2.6

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Kepone	143-50-8	0.0011	0.13
		Methacrylonitrile	126-98-7	0.24	84
		Methanol	67-56-1	5.6	NA
		Methapyrilene	91-80-5	0.081	1.5
		Methoxychlor	72-43-5	0.25	0.18
		3-Methylcholanthrene	56-49-5	0.0055	15
		4,4-Methylene bis(2-chloroaniline)	101-14-4	0.50	30
		Methylene chloride	75-09-2	0.089	30
		Methyl ethyl ketone	78-93-3	0.28	36
		Methyl isobutyl ketone	108-10-1	0.14	33
		Methyl methacrylate	80-62-6	0.14	160
		Methyl methansulfonate	66-27-3	0.018	NA
		Methyl parathion	298-00-0	0.014	4.6
		Naphthalene	91-20-3	0.059	5.6
		2-Naphthylamine	91-59-8	0.52	NA
		p-Nitroaniline	100-01-6	0.028	28
		Nitrobenzene	98-95-3	0.068	14
		5-Nitro-o-toluidine	99-55-8	0.32	28
		p-Nitrophenol	100-02-7	0.12	29
		N-Nitrosodiethylamine	55-18-5	0.40	28
		N-Nitrosodimethylamine	62-75-9	0.40	NA
		N-Nitroso-di-n-butylamine	924-16-3	0.40	17
		N-Nitrosomethylethylamine	10595-95-6	0.40	2.3
		N-Nitrosomorpholine	59-89-2	0.40	2.3
		N-Nitrosopiperidine	100-75-4	0.013	35
		N-Nitrosopyrrolidine	930-55-2	0.013	35
		1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (6/02)	3268-87-9	0.000063	0.0025
		1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (6/02)	39001-02-0	0.000063	0.005
		Parathion	56-38-2	0.014	4.6
		Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3	0.10	10
		Pentachlorobenzene	608-93-5	0.055	10
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.00063	0.001
		PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001
		Pentachloronitrobenzene	82-68-8	0.055	4.8
		Pentachlorophenol	87-86-5	0.089	7.4
		Phenacetin	62-44-2	0.081	16
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		1,3-Phenylenediamine	108-45-2	0.010	0.66
		Phorate	298-02-2	0.021	4.6
		Phthalic anhydride	85-44-9	0.055	NA
		Pronamide	23950-58-5	0.093	1.5
		Pyrene	129-00-0	0.067	8.2
		Pyridine	110-86-1	0.014	16
		Safrole	94-59-7	0.081	22
		Silvex (2,4,5-TP)	93-72-1	0.72	7.9
		2,4,5-T	93-76-5	0.72	7.9

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
		TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
		1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
		1,1,2,2-Tetrachloroethane	79-34-6	0.057	6.0
		Tetrachloroethylene	127-18-4	0.056	6.0
		2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4
		Toluene	108-88-3	0.080	10
		Toxaphene	8001-35-2	0.0095	2.6
		Bromofom (Tribromomethane)	75-25-2	0.63	15
		1,2,4-Trichlorobenzene	120-82-1	0.055	19
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
		1,1,2-Trichloroethane	79-00-5	0.054	6.0
		Trichloroethylene	79-01-6	0.054	6.0
		Trichloromonofluoromethane	75-69-4	0.020	30
		2,4,5-Trichlorophenol	95-95-4	0.18	7.4
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4
		1,2,3-Trichloropropane	96-18-4	0.85	30
		1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.057	30
		tris(2,3-Dibromopropyl) phosphate	126-72-7	0.11	NA
		Vinyl chloride	75-01-4	0.27	6.0
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Antimony	7440-36-0	1.9	1.15 mg/l TCLP
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Barium	7440-39-3	1.2	21 mg/l TCLP
		Beryllium	7440-41-7	0.82	NA
		Cadmium	7440-43-9	0.69	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	NA
		Fluoride	16964-48-8	35	NA
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Mercury	7439-97-6	0.15	0.025 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Selenium	7782-49-2	0.82	5.7 mg/l TCLP
		Silver	7440-22-4	0.43	0.14 mg/l TCLP
		Sulfide	8496-25-8	14	NA
		Thallium	7440-28-0	1.4	NA
		Vanadium	7440-62-2	4.3	NA
K001	Bottom sediment sludge from the treatment of wastewaters from wood preserving processes that use creosote and/or pentachlorophenol.	Naphthalene	91-20-3	0.059	5.6
		Pentachlorophenol	87-86-5	0.089	7.4
		Phenanthrene	85-01-8	0.059	5.6
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-3	0.080	10

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K003	Wastewater treatment sludge from the production of molybdate orange pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K004	Wastewater treatment sludge from the production of zinc yellow pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K005	Wastewater treatment sludge from the production of chrome green pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous).	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
	Wastewater treatment sludge from the production of chrome oxide green pigments (hydrated).	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	NA
K007	Wastewater treatment sludge from the production of iron blue pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
K008	Oven residue from the production of chrome oxide green pigments.	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K009	Distillation bottoms from the production of acetaldehyde from ethylene.	Chloroform	67-66-3	0.046	6.0
K010	Distillation side cuts from the production of acetaldehyde from ethylene.	Chloroform	67-66-3	0.046	6.0
K011	Bottom stream from the wastewater stripper in the production of acrylonitrile.	Acetonitrile	75-05-8	5.6	38
		Acrylonitrile	107-13-1	0.24	84
		Acrylamide	79-06-1	19	23
		Benzene	71-43-2	0.14	10
		Cyanide (Total)	57-12-5	1.2	590
K013	Bottom stream from the acetonitrile column in the production of acrylonitrile.	Acetonitrile	75-05-8	5.6	38
		Acrylonitrile	107-13-1	0.24	84
		Acrylamide	79-06-1	19	23
		Benzene	71-43-2	0.14	10

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l, or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
		Cyanide (Total)	57-12-5	1.2	590
K014	Bottoms from the acetonitrile purification column in the production of acrylonitrile.	Acetonitrile	75-05-8	5.6	38
		Acrylonitrile	107-13-1	0.24	84
		Acrylamide	79-06-1	19	23
		Benzene	71-43-2	0.14	10
		Cyanide (Total)	57-12-5	1.2	590
K015	Still bottoms from the distillation of benzyl chloride.	Anthracene	120-12-7	0.059	3.4
		Benzenesulfonyl chloride	98-87-3	0.055	6.0
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Phenanthrene	85-01-8	0.059	5.6
		Toluene	108-88-3	0.080	10
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
K016	Heavy ends or distillation residues from the production of carbon tetrachloride.	Hexachlorobenzene	118-74-1	0.055	10
		Hexachlorobutadiene	87-68-3	0.055	5.6
		Hexachlorocyclopentadiene	77-47-4	0.057	2.4
		Hexachloroethane	67-72-1	0.055	30
		Tetrachloroethylene	127-18-4	0.056	6.0
K017	Heavy ends (still bottoms) from the purification column in the production of epichlorohydrin.	bis(2-Chloroethyl)ether	111-44-4	0.033	6.0
		1,2-Dichloropropane	78-87-5	0.85	18
		1,2,3-Trichloropropane	96-18-4	0.85	30
K018	Heavy ends from the fractionation column in ethyl chloride production.	Chloroethane	75-00-3	0.27	6.0
		Chloromethane	74-87-3	0.19	NA
		1,1-Dichloroethane	75-34-3	0.059	6.0
		1,2-Dichloroethane	107-06-2	0.21	6.0
		Hexachlorobenzene	118-74-1	0.055	10
		Hexachlorobutadiene	87-68-3	0.055	5.6
		Hexachloroethane	67-72-1	0.055	30
		Pentachloroethane	76-01-7	NA	6.0
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
K019	Heavy ends from the distillation of ethylene dichloride in ethylene dichloride production.	bis(2-Chloroethyl)ether	111-44-4	0.033	6.0
		Chlorobenzene	108-90-7	0.057	6.0
		Chloroform	67-66-3	0.046	6.0
		p-Dichlorobenzene	106-46-7	0.090	NA
		1,2-Dichloroethane	107-06-2	0.21	6.0
		Fluorene	86-73-7	0.059	NA
		Hexachloroethane	67-72-1	0.055	30
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	NA
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,2,4-Trichlorobenzene	120-82-1	0.055	19
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
		K020	Heavy ends from the distillation of vinyl chloride in vinyl chloride monomer production.	1,2-Dichloroethane	107-06-2
1,1,2,2-Tetrachloroethane	79-34-6			0.057	6.0
Tetrachloroethylene	127-18-4			0.056	6.0
K021		Carbon tetrachloride	56-23-5	0.057	6.0
		Chloroform	67-66-3	0.046	6.0

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	Aqueous spent antimony catalyst waste from fluoromethanes production.	Antimony	7440-36-0	1.9	1.15 mg/l TCLP
K022	Distillation bottom tars from the production of phenol/acetone from cumene.	Toluene	108-88-3	0.080	10
		Acetophenone	96-86-2	0.010	9.7
		Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	0.92	13
		Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	13
		Phenol	108-95-2	0.039	6.2
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
K023	Distillation light ends from the production of phthalic anhydride from naphthalene.	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	100-21-0	0.055	28
		Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	85-44-9	0.055	28
K024	Distillation bottoms from the production of phthalic anhydride from naphthalene.	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	100-21-0	0.055	28
		Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	85-44-9	0.055	28
K025	Distillation bottoms from the production of nitrobenzene by the nitration of benzene.	NA	NA	LLEXT fb SSTRP fb CARBN; or CMBST	CMBST
K026	Stripping still tails from the production of methyl ethyl pyridines.	NA	NA	CMBST	CMBST
K027	Centrifuge and distillation residues from toluene diisocyanate production.	NA	NA	CARBN; or CMBST	CMBST
K028	Spent catalyst from the hydrochlorinator reactor in the production of 1,1,1-trichloroethane.	1,1-Dichloroethane	75-34-3	0.059	6.0
		trans-1,2-Dichloroethylene	156-60-5	0.054	30
		Hexachlorobutadiene	87-68-3	0.055	5.6
		Hexachloroethane	67-72-1	0.055	30
		Pentachloroethane	76-01-7	NA	6.0
		1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
		1,1,2,2-Tetrachloroethane	79-34-6	0.057	6.0
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
		1,1,2-Trichloroethane	79-00-5	0.054	6.0
		Cadmium	7440-43-9	0.69	NA
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
K029	Waste from the product steam stripper in the production of 1,1,1-trichloroethane.	Chloroform	67-66-3	0.046	6.0
		1,2-Dichloroethane	107-06-2	0.21	6.0
		1,1-Dichloroethylene	75-35-4	0.025	6.0
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
		Vinyl chloride	75-01-4	0.27	6.0

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
K030	Column bodies or heavy ends from the combined production of trichloroethylene and perchloroethylene.	o-Dichlorobenzene	95-50-1	0.088	NA
		p-Dichlorobenzene	106-46-7	0.090	NA
		Hexachlorobutadiene	87-68-3	0.055	5.6
		Hexachloroethane	67-72-1	0.055	30
		Hexachloropropylene	1888-71-7	NA	30
		Pentachlorobenzene	608-93-5	NA	10
		Pentachloroethane	76-01-7	NA	6.0
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,2,4-Trichlorobenzene	120-82-1	0.055	19
K031	By-product salts generated in the production of MSMA and cacodylic acid.	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
K032	Wastewater treatment sludge from the production of chlordane.	Hexachlorocyclopentadiene	77-47-4	0.057	2.4
		Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26
		Heptachlor	76-44-8	0.0012	0.066
		Heptachlor epoxide	1024-57-3	0.016	0.066
K033	Wastewater and scrub water from the chlorination of cyclopentadiene in the production of chlordane.	Hexachlorocyclopentadiene	77-47-4	0.057	2.4
K034	Filter solids from the filtration of hexachlorocyclopentadiene in the production of chlordane.	Hexachlorocyclopentadiene	77-47-4	0.057	2.4
K035	Wastewater treatment sludges generated in the production of creosote.	Acenaphthene	83-32-9	NA	3.4
		Anthracene	120-12-7	NA	3.4
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Chrysene	218-01-9	0.059	3.4
		o-Cresol	95-48-7	0.11	5.6
		m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
		p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
		Dibenz(a,h)anthracene	53-70-3	NA	8.2
		Fluoranthene	206-44-0	0.068	3.4
		Fluorene	86-73-7	NA	3.4
		Indeno(1,2,3-cd)pyrene	193-39-5	NA	3.4
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
K036	Still bottoms from toluene reclamation distillation in the production of disulfoton.	Disulfoton	298-04-4	0.017	6.2
K037	Wastewater treatment sludges from the production of disulfoton.	Disulfoton	298-04-4	0.017	6.2
		Toluene	108-88-3	0.080	10
K038	Wastewater from the washing and stripping of phorate production.	Phorate	298-02-2	0.021	4.6
K039	Filter cake from the filtration of diethylphosphorodithioic acid in the production of phorate.	NA	NA	CARBN; or CMBST	CMBST
K040	Wastewater treatment sludge from the production of phorate.	Phorate	298-02-2	0.021	4.6

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
K041	Wastewater treatment sludge from the production of toxaphene.	Toxaphene	8001-35-2	0.0095	2.6
K042	Heavy ends or distillation residues from the distillation of tetrachlorobenzene in the production of 2,4,5-T.	o-Dichlorobenzene	95-50-1	0.088	6.0
		p-Dichlorobenzene	106-46-7	0.090	6.0
		Pentachlorobenzene	608-93-5	0.055	10
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
K043	2,6-Dichlorophenol waste from the production of 2,4-D.	1,2,4-Trichlorobenzene	120-82-1	0.055	19
		2,4-Dichlorophenol	120-83-2	0.044	14
		2,6-Dichlorophenol	187-65-0	0.044	14
		2,4,5-Trichlorophenol	95-95-4	0.18	7.4
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4
		2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4
		Pentachlorophenol	87-86-5	0.089	7.4
		Tetrachloroethylene	127-18-4	0.056	6.0
		HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001
		TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
K044	Wastewater treatment sludges from the manufacturing and processing of explosives.	NA	NA	DEACT	DEACT
K045	Spent carbon from the treatment of wastewater containing explosives.	NA	NA	DEACT	DEACT
K046	Wastewater treatment sludges from the manufacturing, formulation and loading of lead-based initiating compounds.	Lead	7439-92-1	0.69	0.75 mg/l TCLP
K047	Pink/red water from TNT operations	NA	NA	DEACT	DEACT
K048	Dissolved air flotation (DAF) float from the petroleum refining industry.	Benzene	71-43-2	0.14	10
		Benzo(a)pyrene	50-32-8	0.061	3.4
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		Chrysene	218-01-9	0.059	3.4
		Di-n-butyl phthalate	84-74-2	0.057	28
		Ethylbenzene	100-41-4	0.057	10
		Fluorene	86-73-7	0.059	NA
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.509	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-33	0.080	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Lead	7439-92-1	0.69	NA
		Nickel	7440-02-0	NA	11 mg/l TCLP

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
K049	Slop oil emulsion solids from the petroleum refining industry.	Anthracene	120-12-7	0.059	3.4
		Benzene	71-43-2	0.14	10
		Benzo(a)pyrene	50-32-8	0.061	3.4
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		Carbon disulfide	75-15-0	3.8	NA
		Chrysene	218-01-9	0.059	3.4
		2,4-Dimethylphenol	105-67-9	0.036	NA
		Ethylbenzene	100-41-4	0.057	10
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-3	0.080	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	NA
Nickel	7440-02-0	NA	11 mg/l TCLP		
K050	Heat exchanger bundle cleaning sludge from the petroleum refining industry.	Benzo(a)pyrene	50-32-8	0.061	3.4
		Phenol	108-95-2	0.039	6.2
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	NA
		Nickel	7440-02-0	NA	11 mg/l TCLP
K051	API separator sludge from the petroleum refining industry.	Acenaphthene	83-32-9	0.059	NA
		Anthracene	120-12-7	0.059	3.4
		Benzo(a)anthracene	56-55-3	0.059	3.4
		Benzene	71-43-2	0.14	10
		Benzo(a)pyrene	50-32-8	0.061	3.4
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		Chrysene	218-01-9	0.059	3.4
		Di-n-butyl phthalate	105-67-9	0.057	28
		Ethylbenzene	100-41-4	0.057	10
		Fluorene	86-73-7	0.059	NA
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-3	0.08	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	NA
		Nickel	7440-02-0	NA	11 mg/l TCLP
K052	Tank bottoms (leaded) from the petroleum refining industry.	Benzene	71-43-2	0.14	10
		Benzo(a)pyrene	50-32-8	0.061	3.4
		o-Cresol	95-48-7	0.11	5.6

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters		
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴		
		m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6		
		p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6		
		2,4-Dimethylphenol	105-67-9	0.036	NA		
		Ethylbenzene	100-41-4	0.057	10		
		Naphthalene	91-20-3	0.059	5.6		
		Phenanthrene	85-01-8	0.059	5.6		
		Phenol	108-95-2	0.039	6.2		
		Toluene	108-88-3	0.08	10		
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30		
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP		
		Cyanides (Total) ⁷	57-12-5	1.2	590		
		Lead	7439-92-1	0.69	NA		
		Nickel	7440-02-0	NA	11 mg/l TCLP		
		K060	Ammonia still lime sludge from coking operations.	Benzene	71-43-2	0.14	10
				Benzo(a)pyrene	50-32-8	0.061	3.4
Naphthalene	91-20-3			0.059	5.6		
Phenol	108-95-2			0.039	6.2		
Cyanides (Total) ⁷	57-12-5			1.2	590		
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.	Antimony	7440-36-0	NA	1.15 mg/l TCLP		
		Arsenic	7440-38-2	NA	5.0 mg/l TCLP		
		Barium	7440-39-3	NA	21 mg/l TCLP		
		Beryllium	7440-41-7	NA	1.22 mg/l TCLP		
		Cadmium	7440-43-9	0.69	0.11 mg/l TCLP		
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP		
		Lead	7439-92-1	0.69	0.75 mg/l TCLP		
		Mercury	7439-97-6	NA	0.025 mg/l TCLP		
		Nickel	7440-02-0	3.98	11 mg/l TCLP		
		Selenium	7782-49-2	NA	5.7 mg/l TCLP		
		Silver	7440-22-4	NA	0.14 mg/l TCLP		
		Thallium	7440-28-0	NA	0.20 mg/l TCLP		
		Zinc	7440-66-6	NA	4.3 mg/l TCLP		
K062	Spent pickle liquor generated by steel finishing operations of facilities within the iron and steel industry (SIC Codes 331 and 332).	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP		
		Lead	7439-92-1	0.69	0.75 mg/l TCLP		
		Nickel	7440-02-0	3.98	NA		
K069	Emission control dust/sludge from secondary lead smelting. – Calcium Sulfate (Low Lead) Subcategory	Cadmium	7440-43-9	0.69	0.11 mg/l TCLP		
		Lead	7439-92-1	0.69	0.75 mg/l TCLP		

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	Emission control dust/sludge from secondary lead smelting. – Non-Calcium Sulfate (High Lead) Subcategory	NA	NA	NA	RLEAD
K071	K071 (Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used) nonwastewaters that are residues from RMERC.	Mercury	7439-97-6	NA	0.20 mg/l TCLP
	K071 (Brine purification muds from the mercury cell process in chlorine production, where separately prepurified brine is not used.) nonwastewaters that are not residues from RMERC.	Mercury	7439-97-6	NA	0.025 mg/l TCLP
	All K071 wastewaters.	Mercury	7439-97-6	0.15	NA
K073	Chlorinated hydrocarbon waste from the purification step of the diaphragm cell process using graphite anodes in chlorine production.	Carbon tetrachloride	56-23-5	0.057	6.0
		Chloroform	67-66-3	0.046	6.0
		Hexachloroethane	67-72-1	0.055	30
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
K083	Distillation bottoms from aniline production.	Aniline	62-53-3	0.81	14
		Benzene	71-43-2	0.14	10
		Cyclohexanone	108-94-1	0.36	NA
		Diphenylamine (difficult to distinguish from diphenylnitrosamine)	122-39-4	0.92	13
		Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	13
		Nitrobenzene	98-95-3	0.068	14
		Phenol	108-95-2	0.039	6.2
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		K085	Distillation or fractionation column bottoms from the production of chlorobenzenes.	Benzene	71-43-2
Chlorobenzene	108-90-7			0.057	6.0
m-Dichlorobenzene	541-73-1			0.036	6.0
o-Dichlorobenzene	95-50-1			0.088	6.0
p-Dichlorobenzene	106-46-7			0.090	6.0
Hexachlorobenzene	118-74-1			0.055	10
Total PCBs (sum of all PCB isomers, or all Aroclors)	1336-36-3			0.10	10
Pentachlorobenzene	608-93-5			0.055	10
1,2,4,5-Tetrachlorobenzene	95-94-3			0.055	14
1,2,4-Trichlorobenzene	120-82-1			0.055	19
K086	Solvent wastes and sludges, caustic washes and sludges, or water washes and sludges from cleaning tubs and equipment used in the formulation of ink from pigments,			Acetone	67-64-1
		Acetophenone	96-86-2	0.010	9.7
		bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
		n-Butyl alcohol	71-36-3	5.6	2.6
		Butylbenzyl phthalate	85-68-7	0.017	28

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	driers, soaps, and stabilizers containing chromium and lead.	Cyclohexanone	108-94-1	0.36	NA
		o-Dichlorobenzene	95-50-1	0.088	6.0
		Diethyl phthalate	84-66-2	0.20	28
		Dimethyl phthalate	131-11-3	0.047	28
		Di-n-butyl phthalate	84-74-2	0.057	28
		Di-n-octyl phthalate	117-84-0	0.017	28
		Ethyl acetate	141-78-6	0.34	33
		Ethylbenzene	100-41-4	0.057	10
		Methanol	67-56-1	5.6	NA
		Methyl ethyl ketone	78-93-3	0.28	36
		Methyl isobutyl ketone	108-10-1	0.14	33
		Methylene chloride	75-09-2	0.089	30
		Naphthalene	91-20-3	0.059	5.6
		Nitrobenzene	98-95-3	0.068	14
		Toluene	108-88-3	0.080	10
		1,1,1-Trichloroethane	71-55-6	0.054	6.0
		Trichloroethylene	79-01-6	0.054	6.0
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K087	Decanter tank tar sludge from coking operations.	Acenaphthylene	208-96-8	0.059	3.4
		Benzene	71-43-2	0.14	10
		Chrysene	218-01-9	0.059	3.4
		Fluoranthene	206-44-0	0.068	3.4
		Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	85-01-8	0.059	5.6
		Toluene	108-88-3	0.080	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Lead	7439-92-1	0.69	0.75 m/l TCLP
		K088	Spent potliners from primary aluminum reduction.	Acenaphthalene	83-32-9
Anthracene	120-12-7			0.059	3.4
Benzo(a)anthracene	56-55-3			0.059	3.4
Benzo(a)pyrene	50-32-8			0.061	3.4
Benzo(b)fluoranthene	205-99-2			0.11	6.8
Benzo(k)fluoranthene	207-08-9			0.11	6.8
Benzo(g,h,i)perylene	191-24-2			0.0055	1.8
Chrysene	218-01-9			0.059	3.4
Dibenz(a,h)anthracene	53-70-3			0.055	8.2
Fluoranthene	206-44-0			0.068	3.4
Indeno(1,2,3-cd)pyrene	193-39-5			0.0055	3.4
Phenanthrene	85-01-8			0.059	5.6
Pyrene	129-00-0			0.067	8.2
Antimony	7440-36-0			1.9	1.15 mg/l TCLP
Arsenic	7440-38-2			1.4	26.1 mg/l TCLP

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Barium	7440-39-3	1.2	21 mg/l TCLP
		Beryllium	7440-41-7	0.82	1.22 mg/l TCLP
		Cadmium	7440-43-9	0.69	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
		Mercury	7439-97-6	0.15	0.025 mg/l TCLP
		Nickel	7440-02-0	3.98	11 mg/l TCLP
		Selenium	7782-49-2	0.82	5.7 mg/l TCLP
		Silver	7440-22-4	0.43	0.14 mg/l TCLP
		Cyanide (Total) ⁷	57-12-5	1.2	590
		Cyanide (Amenable) ⁷	57-12-5	0.86	30
		Fluoride	16984-48-8	35	NA
K093	Distillation light ends from the production of phthalic anhydride from ortho-xylene.	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	100-21-0	0.055	28
		Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	85-44-9	0.055	28
K094	Distillation bottoms from the production of phthalic anhydride from ortho-xylene.	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	100-21-0	0.055	28
		Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	85-44-9	0.055	28
K095	Distillation bottoms from the production of 1,1,1-trichloroethane.	Hexachloroethane	67-72-1	0.055	30
		Pentachloroethane	76-01-7	0.055	6.0
		1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
		1,1,2,2-Tetrachloroethane	79-34-6	0.057	6.0
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,1,2-Trichloroethane	79-00-5	0.054	6.0
		Trichloroethylene	79-01-6	0.054	6.0
K096	Heavy ends from the heavy ends column from the production of 1,1,1-trichloroethane.	m-Dichlorobenzene	541-73-1	0.036	6.0
		Pentachloroethane	76-01-7	0.055	6.0
		1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
		1,1,2,2-Tetrachloroethane	79-34-6	0.057	6.0
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,2,4-Trichlorobenzene	120-82-1	0.055	19
		1,1,2-Trichloroethane	79-00-5	0.054	6.0
		Trichloroethylene	79-01-6	0.054	6.0
K097	Vacuum stripper discharge from the chlordane chlorinator in the production of chlordane.	Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26
		Heptachlor	76-44-8	0.0012	0.066
		Heptachlor epoxide	1024-57-3	0.016	0.066
		Hexachlorocyclopentadiene	77-47-4	0.057	2.4
K098	Untreated process wastewater from the production of toxaphene.	Toxaphene	8001-35-2	0.0095	2.6
K099	Untreated wastewater from the production of 2,4-D.	2,4-Dichlorophenoxyacetic acid	94-75-7	0.72	10
		HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
		PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		PeCDFs (All Pentachlorodibenzofurans)	NA	0.000063	0.001
		TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
		TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.	Cadmium	7440-43-9	0.69	0.11 mg/l TCLP
		Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
K101	Distillation tar residues from the distillation of aniline-based compounds in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	o-Nitroaniline	88-74-4	0.27	14
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Cadmium	7440-43-9	0.69	NA
		Lead	7439-92-1	0.69	NA
		Mercury	7439-97-6	0.15	NA
K102	Residue from the use of activated carbon for decolorization in the production of veterinary pharmaceuticals from arsenic or organo-arsenic compounds.	o-Nitrophenol	88-75-5	0.028	13
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
		Cadmium	7440-43-9	0.69	NA
		Lead	7439-92-1	0.69	NA
		Mercury	7439-97-6	0.15	NA
K103	Process residues from aniline extraction from the production of aniline.	Aniline	62-53-3	0.81	14
		Benzene	71-43-2	0.14	10
		2,4-Dinitrophenol	51-28-5	0.12	160
		Nitrobenzene	98-95-3	0.068	14
		Phenol	108-95-2	0.039	6.2
K104	Combined wastewater streams generated from nitrobenzene/aniline production.	Aniline	62-53-3	0.81	14
		Benzene	71-43-2	0.14	10
		2,4-Dinitrophenol	51-28-5	0.12	160
		Nitrobenzene	98-95-3	0.068	14
		Phenol	108-95-2	0.039	6.2
		Cyanides (Total) ⁷	57-12-5	1.2	590
K105	Separated aqueous stream from the reactor product washing step in the production of chlorobenzenes.	Benzene	71-43-2	0.14	10
		Chlorobenzene	108-90-7	0.057	6.0
		2-Chlorophenol	95-57-8	0.044	5.7
		o-Dichlorobenzene	95-50-1	0.088	6.0
		p-Dichlorobenzene	106-46-7	0.090	6.0
		Phenol	108-95-2	0.039	6.2
		2,4,5-Trichlorophenol	95-95-4	0.18	7.4
		2,4,6-Trichlorophenol	88-06-2	0.035	7.4
K106	K106 (wastewater treatment sludge from the mercury cell process in chlorine production) nonwastewaters that contain greater than or equal to 260 mg/kg total mercury.	Mercury	7439-97-6	NA	RMERC
	K106 (wastewater treatment sludge from the mercury cell process in chlorine production) nonwastewaters that contain less than 260 mg/kg total mercury that are residues from RMERC.	Mercury	7439-97-6	NA	0.20 mg/l TCLP

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
	Other K106 nonwastewaters that contain less than 260 mg/kg total mercury and are not residues from RMERC.	Mercury	7439-97-6	NA	0.025 mg/l TCLP
	All K106 wastewaters.	Mercury	7439-97-6	0.15	NA
K107	Column bottoms from product separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	NA	NA	CMBST; or CHOXD fb CARBN; or BIODG fb CARBN	CMBST
K108	Condensed column overheads from product separation and condensed reactor vent gases from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	NA	NA	CMBST; or CHOXD fb CARBN; or BIODG fb CARBN	CMBST
K109	Spent filter cartridges from product purification from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	NA	NA	CMBST; or CHOXD fb CARBN; or BIODG fb CARBN	CMBST
K110	Condensed column overheads from intermediate separation from the production of 1,1-dimethylhydrazine (UDMH) from carboxylic acid hydrazides.	NA	NA	CMBST; or CHOXD fb CARBN; or BIODG fb CARBN	CMBST
K111	Product washwaters from the production of dinitrotoluene via nitration of toluene	2,4-Dinitrotoluene	121-14-2	0.32	140
		2,6-Dinitrotoluene	606-20-2	0.55	28
K112	Reaction by-product water from the drying column in the production of toluenediamine via hydrogenation of dinitrotoluene.	NA	NA	CMBST; or CHOXD fb CARBN; or BIODG fb CARBN	CMBST
K113	Condensed liquid light ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	NA	NA	CARBN; OR CMBST	CMBST
K114	Vicinals from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	NA	NA	CARBN; or CMBST	CMBST
K115	Heavy ends from the purification of toluenediamine in the production of toluenediamine via hydrogenation of dinitrotoluene.	Nickel	7440-02-0	3.98	11 mg/l TCLP
		NA	NA	CARBN; or CMBST	CMBST
K116	Organic condensate from the solvent recovery column in the production of toluene diisocyanate via phosgenation of toluenediamine.	NA	NA	CARBN; or CMBST	CMBST
K117	Wastewater from the reactor vent gas scrubber in the production of ethylene dibromide via bromination of ethene.	Methyl bromide (Bromomethane)	74-83-9	0.11	15
		Chloroform	67-66-3	0.046	6.0
		Ethylene dibromide (1,2-Dibromoethane)	106-93-4	0.028	15

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
K118	Spent absorbent solids from purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	Methyl bromide (Bromomethane)	74-83-9	0.11	15
		Chloroform	67-66-3	0.046	6.0
		Ethylene dibromide (1,2-Dibromoethane)	106-93-4	0.028	15
K123	Process wastewater (including supernates, filtrates, and washwaters) from the production of ethylenedisithiocarbamic acid and its salts.	NA	NA	CMBST; or CHOXD fb (BIODG or CARBN)	CMBST
K124	Reactor vent scrubber water from the production of ethylenedisithiocarbamic acid and its salts.	NA	NA	CMBST; or CHOXD fb (BIODG or CARBN)	CMBST
K125	Filtration, evaporation, and centrifugation solids from the production of ethylenedisithiocarbamic acid and its salts.	NA	NA	CMBST; or CHOXD fb (BIODG or CARBN)	CMBST
K126	Baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of ethylenedisithiocarbamic acid and its salts.	NA	NA	CMBST; or CHOXD fb (BIODG or CARBN)	CMBST
K131	Wastewater from the reactor and spent sulfuric acid from the acid dryer from the production of methyl bromide.	Methyl bromide (Bromomethane)	74-83-9	0.11	15
K132	Spent absorbent and wastewater separator solids from the production of methyl bromide.	Methyl bromide (Bromomethane)	74-83-9	0.11	15
K136	Still bottoms from the purification of ethylene dibromide in the production of ethylene dibromide via bromination of ethene.	Methyl bromide (Bromomethane)	74-83-9	0.11	15
		Chloroform	67-66-3	0.046	6.0
		Ethylene dibromide (1,2-Dibromoethane)	106-93-4	0.028	15
K141	Process residues from the recovery of coal tar, including, but not limited to, collecting sump residues from the production of coke or the recovery of coke by-products produced from coal. This listing does not include K087 (decanter tank tar sludge from coking operations).	Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-2-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
		Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
K142	Tar storage tank residues from the production of coke from coal or from the recovery of coke by-products produced from coal.	Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
K 143	Process residues from the recovery of light oil, including, but not limited to, those generated in stills, decanters, and wash oil recovery units from the recovery of coke by-products produced from coal.	Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
		Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
K 144	Wastewater sump residues from light oil refining, including, but not limited to, intercepting or contamination sump sludges from the recovery of coke by-products produced from coal.	Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
K 145	Residues from naphthalene collection and recovery operations from the recovery of coke by-products produced from coal.	Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
		Naphthalene	91-20-3	0.059	5.6
		Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
K 147	Tar storage tank residues from coal tar refining.	Benzene	71-43-2	0.14	10
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
K 148	Residues from coal tar distillation, including, but not limited to, still bottoms.	Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzo(a)pyrene	50-32-8	0.061	3.4
		Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
		Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
		Chrysene	218-01-9	0.059	3.4
		Dibenz(a,h)anthracene	53-70-3	0.055	8.2
K 149	Distillation bottoms from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups. (This waste does not include still bottoms from the distillations of benzyl chloride.)	Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
		Chlorobenzene	108-90-7	0.057	6.0
		Chloroform	67-66-3	0.046	6.0
		Chloromethane	74-87-3	0.19	30
		p-Dichlorobenzene	106-46-7	0.090	6.0
		Hexachlorobenzene	118-74-1	0.055	10
		Pentachlorobenzene	608-93-5	0.055	10
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
		Toluene	108-88-3	0.080	10
		Carbon tetrachloride	56-23-5	0.057	6.0

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	Organic residuals, excluding spent carbon adsorbent, from the spent chlorine gas and hydrochloric acid recovery processes associated with the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.	Chloroform	67-66-3	0.046	6.0
		Chloromethane	74-87-3	0.19	30
		p-Dichlorobenzene	106-46-7	0.090	6.0
		Hexachlorobenzene	118-74-1	0.055	10
		Pentachlorobenzene	608-93-5	0.055	10
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
		1,1,2,2-Tetrachloroethane	79-34-5	0.057	6.0
		Tetrachloroethylene	127-18-4	0.056	6.0
		1,2,4-Trichlorobenzene	120-82-1	0.055	19
		Benzene	71-43-2	0.14	10
		Carbon tetrachloride	56-23-5	0.057	6.0
K151	Wastewater treatment sludges, excluding neutralization and biological sludges, generated during the treatment of wastewaters from the production of alpha- (or methyl-) chlorinated toluenes, ring-chlorinated toluenes, benzoyl chlorides, and compounds with mixtures of these functional groups.	Chloroform	67-66-3	0.046	6.0
		Hexachlorobenzene	118-74-1	0.055	10
		Pentachlorobenzene	608-93-5	0.055	10
		1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
		Tetrachloroethylene	127-18-4	0.056	6.0
		Toluene	108-88-3	0.080	10
		Acetonitrile	75-05-8	5.6	1.8
		Acetophenone	98-86-2	0.010	9.7
		Aniline	62-53-3	0.81	14
		Benomyl ¹⁰	17804-35-2	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
		Benzene	71-43-2	0.14	10
K156	Organic waste (including heavy ends, still bottoms, light ends, spent solvents, filtrates, and decantates) from the production of carbamates and carbamoyl oximes.	Carbaryl ¹⁰	63-25-2	0.006; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
		Carbenzadim ¹⁰	10605-21-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
		Carbofuran ¹⁰	1563-66-2	0.006; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
		Carbosulfan ¹⁰	55285-14-8	0.028; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
		Chlorobenzene	108-90-7	0.507	6.0
		Chloroform	67-66-3	0.046	6.0
		o-Dichlorobenzene	95-50-1	0.088	6.0
		Methomyl ¹⁰	16752-77-5	0.028; or CMBST, CHOXD,	0.14; or CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
				BIODG or CARBN	
		Methylene chloride	75-09-2	0.089	30
		Methyl ethyl ketone	78-93-3	0.28	36
		Naphthalene	91-20-3	0.059	5.6
		Phenol	108-95-2	0.039	6.2
		Pyridine	110-86-1	0.014	16
		Toluene	108-88-3	0.080	10
		Triethylamine	121-44-8	0.081; or CMBST, CHOXD, BIODG or CARBN	1.5; or CMBST
K157	Wastewaters (including scrubber waters, condenser waters, washwaters, and separation waters) from the production of carbamates and carbamoyl oximes.	Carbon tetrachloride	56-23-5	0.057	6.0
		Chloroform	67-66-3	0.046	6.0
		Chloromethane	74-87-3	0.19	30
		Methomyl ¹⁰	16752-77-5	0.028; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
		Methylene chloride	75-09-2	0.089	30
		Methyl ethyl ketone	78-93-3	0.28	36
		Pyridine	110-86-1	0.014	16
		Triethylamine	121-44-8	0.081; or CMBST, CHOXD, BIODG or CARBN	1.5; or CMBST
K158	Bag house dusts and filter/separation solids from the production of carbamates and carbamoyl oximes.	Benzene	71-43-2	0.14	10
		Carbenzadim ¹⁰	10605-21-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
		Carbofuran ¹⁰	1563-66-2	0.006; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
		Carbosulfan ¹⁰	55285-14-8	0.028; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
		Chloroform	67-66-3	0.046	6.0
		Methylene chloride	75-09-2	0.089	30
		Phenol	108-95-2	0.039	6.2
		K159	Organics from the treatment of thiocarbamate wastes.	Benzene	71-43-2
Butylate ¹⁰	2008-41-5			0.042; or CMBST, CHOXD, BIODG or	1.4; or CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters		
		Common Name	CAS ² Number	Concentration ³ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴		
				CARBN			
		EPTC (Eptam) ¹⁰	759-94-4	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST		
		Molinate ¹⁰	2212-67-1	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST		
		Pebulate ¹⁰	1114-71-2	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST		
		Vernolate ¹⁰	1929-77-7	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST		
K161	Purification solids (including filtration, evaporation, and centrifugation solids), baghouse dust and floor sweepings from the production of dithiocarbamate acids and their salts.	Antimony	7440-36-0	1.9	1.15 mg/l TCLP		
		Arsenic	7440-38-2	1.4	5.0 mg/l TCLP		
		Carbon disulfide	75-15-0	3.8	4.8 m/l TCLP		
		Dithiocarbamates (total) ¹⁰	NA	0.028; or CMBST, CHOXD, BIODG or CARBN	28; or CMBST		
		Lead	7439-92-1	0.69	0.75 mg/l TCLP		
		Nickel	7440-02-0	3.98	11.0 mg/l TCLP		
		Selenium	7782-49-2	0.82	5.7 mg/l TCLP		
K169	Crude oil tank sediment from petroleum refining operations. (8/00)	Benz(a)anthracene	56-55-3	0.059	3.4		
		Benzene	71-43-2	0.14	10.		
		Benzo(g,h,i)perylene	191-24-2	0.0055	1.8		
		Chrysene	218-01-9	0.059	3.4		
		Ethyl benzene	100-41-4	0.057	10.		
		Fluorene	86-73-7	0.059	3.4		
		Naphthalene	91-20-3	0.059	5.6		
		Phenanthrene	81-05-8	0.059	5.6		
		Pyrene	129-00-0	0.067	8.2		
		Toluene (Methyl Benzene)	108-88-3	0.080	10.		
		Xylene(s) (Total)	1330-20-7	0.32	30.		
		K170	Clarified slurry oil sediment from petroleum refining operations. (8/00)	Benz(a)anthracene	56-55-3	0.059	3.4
				Benzene	71-43-2	0.14	10.
Benzo(g,h,i)perylene	191-24-2			0.0055	1.8		
Chrysene	218-01-9			0.059	3.4		
Dibenz(a,h)anthracene	53-70-3			0.055	8.2		
Ethyl benzene	100-41-4			0.057	10.		

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Fluorene	86-73-7	0.059	3.4
		Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	81-05-8	0.059	5.6
		Pyrene	129-00-0	0.067	8.2
		Toluene (Methyl Benzene)	108-88-3	0.080	10.
		Xylene(s) (Total)	1330-20-7	0.32	30.
		Benz(a)anthracene	56-55-3	0.059	3.4
		Benzene	71-43-2	0.14	10.
		Chrysene	218-01-9	0.059	3.4
K171	Spent hydrotreating catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media.) (8/00)	Ethyl benzene	100-41-4	0.057	10.
		Naphthalene	91-20-3	0.059	5.6
		Phenanthrene	81-05-8	0.059	5.6
		Pyrene	129-00-0	0.067	8.2
		Toluene (Methyl Benzene)	108-88-3	0.080	10.
		Xylene(s) (Total)	1330-20-7	0.32	30.
		Arsenic	7740-38-2	1.4	5. mg/L TCLP
		Nickel	7440-02-0	3.98	11.0 mg/L TCLP
		Vanadium	7440-62-2	4.3	1.6 mg/L TCLP
		Reactive sulfides	NA	DEACT	DEACT
K172	Spent hydrotreating catalyst from petroleum refining operations, including guard beds used to desulfurize feeds to other catalytic reactors (this listing does not include inert support media.)	Benzene	71-43-2	0.14	10.
		Ethyl benzene	100-41-4	0.057	10.
		Toluene (Methyl Benzene)	108-88-3	0.080	10.
		Xylene(s) (Total)	1330-20-7	0.32	30.
		Antimony	7740-36-0	1.9	1.15 mg/L TCLP
		Arsenic	7740-38-2	1.4	5. mg/L TCLP
		Nickel	7440-02-0	3.98	11.0 mg/L TCLP
		Vanadium	7440-62-2	4.3	1.6 mg/L TCLP
		Reactive Sulfides	NA	DEACT	DEACT
		K174	Wastewater treatment sludges from the production of ethylene dichloride or vinyl chloride monomer (6/02)	1, 2, 3, 4, 6, 7, 8-Heptachlorodibenzo-p-dioxin (1, 2, 3, 4, 6, 7, 8 HpCDD)	35822-46-9
1, 2, 3, 4, 6, 7, 8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	67562-39-4			0.000035 or CMBST ¹¹	0.0025 or CMBST ¹¹
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	55673-89-7			0.000035 or CMBST ¹¹	0.0025 or CMBST ¹¹
HxCDDs (All Hexachlorodibenzo-p-dioxins)	34465-46-8			0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
HxCDFs (All Hexachlorodibenzofurans)	55684-94-1			0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	3268-87-9			0.000063 or CMBST ¹¹	0.005 or CMBST ¹¹
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0			0.000063 or CMBST ¹¹	0.005 or CMBST ¹¹
PeCDDs (All Pentachlorodibenzo-p-dioxins)	36088-22-9			0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
PeCDFs (All Pentachlorodibenzofurans)	30402-15-4			0.000035 or CMBST ¹¹	0.001 or CMBST ¹¹

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		TCDDs (All tetrachlorodibenzo- <i>p</i> -dioxins)	41903-57-5	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		TCDFs (All tetrachlorodibenzofurans)	7440-36-0	1.4	5.0 mg/L TCLP
K 175	Wastewater treatment sludge from the production of vinyl chloride monomer using mercuric chloride catalyst in an acetylene-based process.(6/02)	Mercury ¹²	7438-97-6	NA	0.025 mg/L TCLP
		pH ¹²		NA pH<6.0	
	All K175 wastewaters	Mercury	7438-97-6	0.15	NA
K 176	Baghouse filters from the production of antimony oxide, including filters from the production of intermediates (e.g., antimony metal or crude antimony oxide). (6/03)	Antimony	7440-36-0	1.9	1.15 mg/L TCLP
		Arsenic	7440-38-2	1.4	5.0 mg/L TCLP
		Cadmium	7440-43-9	0.69	0.11 mg/L TCLP
		Lead	7439-92-1	0.69	0.75 mg/L TCLP
		Mercury	7439-97-6	0.15	0.025 mg/L TCLP
K 177	Slag from the production of antimony oxide that is speculatively accumulated or disposed, including slag from the production of intermediates (e.g., antimony metal or crude antimony oxide). (6/03)	Antimony	7440-36-0	1.9	1.15 mg/L TCLP
		Arsenic	7440-38-2	1.4	5.0 mg/L TCLP
		Lead	7439-92-1	0.69	0.75 mg/L TCLP
K 178	Residues from manufacturing and manufacturing-site storage of ferric chloride from acids formed during the production of titanium dioxide using the chloride-ilmenite process. (6/03)	1,2,3,4,6,7,8-Heptachlorodibenzo- <i>p</i> -dioxin (1,2,3,4,6,7,8-HpCDD)	35822-39-4	0.000035 or CMBST ¹¹	0.0025 or CMBST ¹¹
		1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF)	67562-39-4	0.000035 or CMBST ¹¹	0.0025 or CMBST ¹¹
		1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF)	55673-89-7	0.000035 or CMBST ¹¹	0.0025 or CMBST ¹¹
		HxCDDs (All Hexachlorodibenzo- <i>p</i> -dioxins)	34465-46-8	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		HxCDFs (All Hexachlorodibenzofurans)	55684-94-1	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		1,2,3,4,6,7,8,9-Octachlorodibenzo- <i>p</i> -dioxin (OCDD)	3268-87-9	0.000063 or CMBST ¹¹	0.005 or CMBST ¹¹
		1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	39001-02-0	0.000063 or CMBST ¹¹	0.005 or CMBST ¹¹
		PeCDDs (All Pentachlorodibenzo- <i>p</i> -dioxins)	36088-22-9	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		PeCDFs (All Pentachlorodibenzofurans)	30402-15-4	0.000035 or CMBST ¹¹	0.001 or CMBST ¹¹
		TCDDs (All tetrachlorodibenzo- <i>p</i> -dioxins)	41903-57-5	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		TCDFs (All tetrachlorodibenzofurans)	55722-27-5	0.000063 or CMBST ¹¹	0.001 or CMBST ¹¹
		Thallium	7440-28-0	1.4	0.20 mg/L TCLP
		K 181	Nonwastewaters from the production of dyes and/or pigments	Aniline	62-53-3
o-Anisidine (2-methoxyaniline)	90-04-0			0.010	0.66

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
	(including nonwastewaters commingled at the point of generation with nonwastewaters from other processes) that, at the point of generation, contain mass loadings of any of the constituents identified in paragraph (c) of section 261.32 that are equal to or greater than the corresponding paragraph (c) levels, as determined on a calendar year basis.	4-Chloroaniline	106-47-8	0.46	16
		p-Cresidine	120-71-8	0.010	0.66
		2,4-Dimethylaniline (2,4-xylydine)	95-68-1	0.010	0.66
		1,2-Phenylenediamine	95-54-5	CMBST; or CHOXD fb (BIODG or CARBN); or BIODG fb CARBN	CMBST; or CHOXD fb (BIODG or CARBN); or BIODG fb CARBN
		1,3-Phenylenediamine	108-45-2	0.10	0.66
P001	Warfarin, & salts, when present at concentrations greater than 0.3%	Warfarin	81-81-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P002	1-Acetyl-2-thiourea	1-Acetyl-2-thiourea	591-08-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P003	Acrolein	Acrolein	107-02-8	0.29	CMBST
P004	Aldrin	Aldrin	309-00-2	0.021	0.066
P005	Allyl alcohol	Allyl alcohol	107-18-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P006	Aluminum phosphide	Aluminum phosphide	20859-73-8	CHOXD; CHRED; or CMBST	CHOXD; CHRED; or CMBST
P007	5-Aminomethyl 3-isoxazolol	5-Aminomethyl 3-isoxazolol	2763-96-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P008	4-Aminopyridine	4-Aminopyridine	504-24-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P009	Ammonium picrate	Ammonium picrate	131-74-8	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
P010	Arsenic acid	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
P011	Arsenic pentoxide	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
P012	Arsenic trioxide	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
P013	Barium cyanide	Barium	7440-39-3	NA	21 mg/l TCLP
		Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P014	Thiophenol (Benzene thiol)	Thiophenol (Benzene thiol)	108-98-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P015	Beryllium dust	Beryllium	7440-41-7	RMETL; or RTHRM	RMETL; or RTHRM

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
P016	Dichloromethyl ether (Bis(chloromethyl)ether)	Dichloromethyl ether	542-88-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P017	Bromoacetone	Bromoacetone	598-31-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P018	Brucine	Brucine	357-57-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P020	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	88-85-7	0.066	2.5
P021	Calcium cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P022	Carbon disulfide	Carbon disulfide	75-15-0	3.8	CMBST
		Carbon disulfide; alternate ⁶ standard for nonwastewaters only	75-15-0	NA	4.8 mg/l TCLP
P023	Chloroacetaldehyde	Chloroacetaldehyde	107-20-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P024	p-Chloroaniline	p-Chloroaniline	106-47-8	0.46	16
P026	1-(o-Chlorophenyl)thiourea	1-(o-Chlorophenyl)thiourea	5344-82-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P027	3-Chloropropionitrile	3-Chloropropionitrile	542-76-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P028	Benzyl chloride	Benzyl chloride	100-44-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P029	Copper cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P030	Cyanides (soluble salts and complexes)	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P031	Cyanogen	Cyanogen	460-19-5	CHOXD; WETOX; or CMBST	CHOXD; WETOX; or CMBST
P033	Cyanogen chloride	Cyanogen chloride	506-77-4	CHOXD; WETOX; or CMBST	CHOXD; WETOX; or CMBST
P034	2-Cyclohexyl-4,6-dinitrophenol	2-Cyclohexyl-4,6-dinitrophenol	131-89-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P036	Dichlorophenylarsine	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
P037	Dieldrin	Dieldrin	60-57-1	0.017	0.13
P038	Diethylarsine	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
P039	Disulfoton	Disulfoton	298-04-4	0.017	6.2
P040	0,0-Diethyl O-pyrazinyl phosphorothioate	0,0-Diethyl O-pyrazinyl phosphorothioate	297-97-2	CARBN; or CMBST	CMBST
P041	Diethyl-p-nitrophenyl phosphate	Diethyl-p-nitrophenyl phosphate	311-45-5	CARBN; or CMBST	CMBST
P042	Epinephrine	Epinephrine	51-43-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P043	Diisopropylfluorophosphate (DFP)	Diisopropylfluorophosphate (DFP)	55-91-4	CARBN; or CMBST	CMBST
P044	Dimethoate	Dimethoate	60-51-5	CARBN; or CMBST	CMBST
P045	Thiofanox	Thiofanox	39196-18-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P046	alpha, alpha-Dimethylphenethylamine	alpha, alpha-Dimethylphenethylamine	122-09-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P047	4,6-Dinitro-o-cresol	4,6-Dinitro-o-cresol	543-52-1	0.28	160
	4,6-Dinitro-o-cresol salts	NA	NA	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P048	2,4-Dinitrophenol	2,4-Dinitrophenol	51-28-5	0.12	160
P049	Dithiobiuret	Dithiobiuret	541-53-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P050	Endosulfan	Endosulfan I	939-98-8	0.023	0.066
		Endosulfan II	33213-6-5	0.029	0.13
		Endosulfan sulfate	1031-07-8	0.029	0.13
P051	Endrin	Endrin	72-20-8	0.0028	0.13
		Endrin aldehyde	7421-93-4	0.025	0.13
P054	Aziridine	Aziridine	151-56-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P056	Fluorine	Fluoride (measured in wastewaters only)	16964-48-8	35	ADGAS fb NEUTR
P057	Fluoroacetamide	Fluoroacetamide	640-19-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P058	Fluoroacetic acid, sodium salt	Fluoroacetic acid, sodium salt	62-74-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P059	Heptachlor	Heptachlor	76-44-8	0.0012	0.066
		Heptachlor epoxide	1024-57-3	0.016	0.066
P060	Isodrin	Isodrin	465-73-6	0.021	0.066

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l; or Technology Code ⁴	Concentration ³ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
P062	Hexaethyl tetraphosphate	Hexaethyl tetraphosphate	757-58-4	CARBN; or CMBST	CMBST
P063	Hydrogen cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P064	Isocyanic acid, ethyl ester	Isocyanic acid, ethyl ester	624-83-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P065	Mercury fulminate nonwastewaters, regardless of their total mercury content, that are not incinerator residues or are not residues from RMERC.	Mercury	7439-97-6	NA	IMERC
	Mercury fulminate nonwastewaters that are either incinerator residues or are residues from RMERC; and contain greater than or equal to 260 mg/kg total mercury.	Mercury	7439-97-6	NA	RMERC
	Mercury fulminate nonwastewaters that are residues from RMERC and contain less than 260 mg/kg total mercury.	Mercury	7439-97-6	NA	0.20 mg/l TCLP
	Mercury fulminate nonwastewaters that are incinerator residues and contain less than 260 mg/kg total mercury.	Mercury	7439-97-6	NA	0.025 mg/l TCLP
	All mercury fulminate wastewaters.	Mercury	7439-97-6	0.15	NA
P066	Methomyl	Methomyl	16752-77-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P067	2-Methyl-aziridine	2-Methyl-aziridine	75-55-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P068	Methyl hydrazine	Methyl hydrazine	60-34-4	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
P069	2-Methylacetonitrile	2-Methylacetonitrile	75-86-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P070	Aldicarb	Aldicarb	116-06-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P071	Methyl parathion	Methyl parathion	298-00-0	0.014	4.6
P072	1-Naphthyl-2-thiourea	1-Naphthyl-2-thiourea	86-88-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
P073	Nickel carbonyl	Nickel	7440-02-0	3.98	11 mg/l TCLP
P074	Nickel cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Nickel	7440-02-0	3.98	11 mg/l TCLP
P075	Nicotine and salts	Nicotine and salts	54-11-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P076	Nitric oxide	Nitric oxide	10102-43-9	ADGAS	ADGAS
P077	p-Nitroaniline	p-Nitroaniline	100-01-6	0.028	28
P078	Nitrogen dioxide	Nitrogen dioxide	10102-44-0	ADGAS	ADGAS
P081	Nitroglycerin	Nitroglycerin	55-63-0	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
P082	N-Nitrosodimethylamine	N-Nitrosodimethylamine	62-75-9	0.40	2.3
P084	N-Nitrosomethylvinylamine	N-Nitrosomethylvinylamine	4549-40-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P085	Octamethylpyrophosphoramide	Octamethylpyrophosphoramide	152-16-9	CARBN; or CMBST	CMBST
P087	Osmium tetroxide	Osmium tetroxide	20816-12-0	RMETL; or RTHRM	RMETL; or RTHRM
P088	Endothall	Endothall	145-73-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P089	Parathion	Parathion	56-38-2	0.014	4.6
P092	Phenyl mercuric acetate nonwastewaters, regardless of their total mercury content, that are not incinerator residues or are not residues from RMERC.	Mercury	7439-97-6	NA	IMERC; or RMERC
	Phenyl mercuric acetate nonwastewaters that are either incinerator residues or are residues from RMERC; and still contain greater than or equal to 260 mg/kg total mercury.	Mercury	7439-97-6	NA	RMERC
	Phenyl mercuric acetate nonwastewaters that are residues from RMERC and contain less than 260 mg/kg total mercury.	Mercury	7439-97-6	NA	0.20 mg/l TCLP
	Phenyl mercuric acetate nonwastewaters that are incinerator residues and contain less than 260 mg/kg total mercury.	Mercury	7439-97-6	NA	0.025 mg/l TCLP
	All phenyl mercuric acetate wastewaters.	Mercury	7439-97-6	0.15	NA
P093	Phenylthiourea	Phenylthiourea	103-85-5	(WETOX or CHOXD) fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
				CARBN; or CMBST	
P094	Phorate	Phorate	298-02-2	0.021	4.6
P095	Phosgene	Phosgene	75-44-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P096	Phosphine	Phosphine	7803-51-2	CHOXD; CHRED; or CMBST	CHOXD; CHRED; or CMBST
P097	Famphur	Famphur	52-85-7	0.017	15
P098	Potassium cyanide.	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P099	Potassium silver cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Silver	7440-22-4	0.43	0.14 mg/l TCLP
P101	Ethyl cyanide (Propanenitrile)	Ethyl cyanide (Propanenitrile)	107-12-0	0.24	360
P102	Propargyl alcohol	Propargyl alcohol	107-19-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P103	Selenourea	Selenium	7782-49-2	0.82	5.7 mg/l TCLP
P104	Silver cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
		Silver	7440-22-4	0.43	0.14 mg/l TCLP
P105	Sodium azide	Sodium azide	26628-22-8	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
P106	Sodium cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P108	Strychnine and salts	Strychnine and salts	57-24-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P109	Tetraethyldithiopyrophosphate	Tetraethyldithiopyrophosphate	3689-24-5	CARBN; or CMBST	CMBST
P110	Tetraethyl lead	Lead	7439-92-1	0.69	0.75 mg/l TCLP
P112	Tetranitromethane	Tetranitromethane	509-14-8	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
P113	Thallic oxide	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL
P114	Thallium selenite	Selenium	7782-49-2	0.82	5.7 mg/l TCLP
P115	Thallium (I) sulfate	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ³ in mg/l, or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
P116	Thiosemicarbazide	Thiosemicarbazide	79-19-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P118	Trichloromethanethiol	Trichloromethanethiol	75-70-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
P119	Ammonium vanadate	Vanadium (measured in wastewaters only)	7440-62-2	4.3	STABL
P120	Vanadium pentoxide	Vanadium (measured in wastewaters only)	7440-62-2	4.3	STABL
P121	Zinc cyanide	Cyanides (Total) ⁷	57-12-5	1.2	590
		Cyanides (Amenable) ⁷	57-12-5	0.86	30
P122	Zinc phosphide Zn ₃ P ₂ , when present at concentrations greater than 10%	Zinc Phosphide	1314-84-7	CHOXD; CHRED; or CMBST	CHOXD; CHRED; or CMBST
P123	Toxaphene	Toxaphene	8001-35-2	0.0095	2.6
P127	Carbofuran ¹⁰	Carbofuran	1563-66-2	0.006; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
P128	Mexacarbate ¹⁰	Mexacarbate	315-18-4	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P185	Tirpate ¹⁰	Tirpate	26419-73-8	0.056; or CMBST, CHOXD, BIODG or CARBN	0.28; or CMBST
P188	Physostigmine salicylate ¹⁰	Physostigmine salicylate	57-64-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P189	Carbosulfan ¹⁰	Carbosulfan	55285-14-8	0.028; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P190	Metolcarb ¹⁰	Metolcarb	1129-41-5	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P191	Dimetilan ¹⁰	Dimetilan	644-64-4	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P192	Isolan ¹⁰	Isolan	119-38-0	0.056; or CMBST, CHOXD,	1.4; or CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
				BIODG or CARBN	
P194	Oxamyl	Oxamyl	23135-22-0	0.056; or CMBST, CHOXD, BIODG or CARBN	0.28; or CMBST
P196	Manganese dimethyldithiocarbamate ¹⁰	Dithiocarbamates (total)	NA	0.028; or CMBST, CHOXD, BIODG or CARBN	28; or CMBST
P197	Formparanate ¹⁰	Formparanate	17702-57-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P198	Formetanate hydrochloride ¹⁰	Formetanate hydrochloride	23422-53-9	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P199	Methiocarb ¹⁰	Methiocarb	2032-65-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P201	Promecarb ¹⁰	Promecarb	2631-37-0	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P202	m-Cumenyl methylcarbamate ¹⁰	m-Cumenyl methylcarbamate	64-00-6	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P203	Aldicarb sulfone ¹⁰	Aldicarb sulfone	1646-88-4	0.056; or CMBST, CHOXD, BIODG or CARBN	0.28; or CMBST
P204	Physostigmine ¹⁰	Physostigmine	57-47-6	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
P205	Ziram ¹⁰	Dithiocarbamates (total)	NA	0.028; or CMBST, CHOXD, BIODG or CARBN	28; or CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
U001	Acetaldehyde	Acetaldehyde	75-07-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U002	Acetone	Acetone	67-64-1	0.28	160
U003	Acetonitrile	Acetonitrile	75-05-8	5.6	CMBST
		Acetonitrile, alternate ⁶ standard for nonwastewaters only	75-05-8	NA	38
U004	Acetophenone	Acetophenone	98-86-2	0.010	9.7
U005	2-Acetylaminofluorene	2-Acetylaminofluorene	53-96-3	0.059	140
U006	Acetyl chloride	Acetyl Chloride	75-36-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U007	Acrylamide	Acrylamide	79-06-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U008	Acrylic acid	Acrylic acid	79-10-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U009	Acrylonitrile	Acrylonitrile	107-13-1	0.24	84
U010	Mitomycin C	Mitomycin C	50-07-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U011	Amitrole	Amitrole	61-82-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U012	Aniline	Aniline	62-53-3	0.81	14
U014	Auramine	Auramine	492-80-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U015	Azaserine	Azaserine	115-02-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U016	Benz(c)acridine	Benz(c)acridine	225-51-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U017	Benzal chloride	Benzal chloride	98-87-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U018	Benz(a)anthracene	Benz(a)anthracene	56-55-3	0.059	3.4
U019	Benzene	Benzene	71-43-2	0.14	10
U020	Benzenesulfonyl chloride	Benzenesulfonyl chloride	98-09-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
U021	Benzdine	Benzdine	92-87-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U022	Benzo(a)pyrene	Benzo(a)pyrene	50-32-8	0.061	3.4
U023	Benzotrchloride	Benzotrchloride	98-07-7	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED or CMBST
U024	bis(2-Chloroethoxy)methane	bis(2-Chloroethoxy)methane	111-91-1	0.036	7.2
U025	bis(2-Chloroethyl)ether	bis(2-Chloroethyl)ether	111-44-4	0.033	6.0
U026	Chlornaphazine	Chlornaphazine	494-03-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U027	bis(2-Chloroisopropyl)ether	bis(2-Chloroisopropyl)ether	39638-32-9	0.055	7.2
U028	bis(2-Ethylhexyl) phthalate	bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
U029	Methyl bromide (Bromomethane)	Methyl bromide (Bromomethane)	74-83-9	0.11	15
U030	4-Bromophenyl phenyl ether	4-Bromophenyl phenyl ether	101-55-3	0.055	15
U031	n-Butyl alcohol	n-Butyl alcohol	71-36-3	5.6	2.6
U032	Calcium chromate	Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
U033	Carbon oxyfluoride	Carbon oxyfluoride	353-50-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U034	Trichloroacetaldehyde (Chloral)	Trichloroacetaldehyde (Chloral)	75-87-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U035	Chlorambucil	Chlorambucil	305-03-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U036	Chlordane	Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26
U037	Chlorobenzene	Chlorobenzene	108-90-7	0.057	6.0
U038	Chlorobenzilate	Chlorobenzilate	510-15-6	0.10	CMBST
U039	p-Chloro-m-cresol	p-Chloro-m-cresol	59-50-7	0.018	14
U041	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	106-89-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U042	2-Chloroethyl vinyl ether	2-Chloroethyl vinyl ether	110-75-8	0.062	CMBST
U043	Vinyl chloride	Vinyl chloride	75-01-4	0.27	6.0
U044	Chloroform	Chloroform	67-66-3	0.046	6.0
U045	Chloromethane (Methyl chloride)	Chloromethane (Methyl chloride)	74-87-3	0.19	30
U046	Chloromethyl methyl ether	Chloromethyl methyl ether	107-30-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U047	2-Chloronaphthalene	2-Chloronaphthalene	91-58-7	0.055	5.6

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
U048	2-Chlorophenol	2-Chlorophenol	95-57-8	0.044	5.7
U049	4-Chloro-o-toluidine hydrochloride	4-Chloro-o-toluidine hydrochloride	3165-93-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U050	Chrysene	Chrysene	218-01-9	0.059	3.4
U051	Creosote	Naphthalene	91-20-3	0.059	5.6
		Pentachlorophenol	87-86-5	0.089	7.4
		Phenanthrene	85-01-8	0.059	5.6
		Pyrene	129-00-0	0.067	8.2
		Toluene	108-88-3	0.080	10
		Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
		Lead	7439-92-1	0.69	0.75 mg/l TCLP
U052	Cresols (Cresylic acid)	o-Cresol	95-48-7	0.11	5.6
		m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
		p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
		Cresol-mixed isomers (Cresylic acid)(sum of o-, m-, and p-cresol concentrations)	1319-77-3	0.88	11.2
U053	Crotonaldehyde	Crotonaldehyde	4170-30-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U055	Cumene	Cumene	98-82-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U056	Cyclohexane	Cyclohexane	110-82-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U057	Cyclohexanone	Cyclohexanone	108-94-1	0.36	CMBST
		Cyclohexanone, alternate ⁶ standard for nonwastewaters only	108-94-1	NA	0.75 mg/l TCLP
U058	Cyclophosphamide	Cyclophosphamide	50-18-0	CARBN; or CMBST	CMBST
U059	Daunomycin	Daunomycin	20830-81-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U060	DDD	o,p'-DDD	53-19-0	0.023	0.087
		p,p'-DDD	72-54-8	0.023	0.087
U061	DDT	o,p'-DDT	789-02-6	0.0039	0.087
		p,p'-DDT	50-29-3	0.0039	0.087
		o,p'-DDD	53-19-0	0.023	0.087
		p,p'-DDD	72-54-8	0.023	0.087
		o,p'-DDE	3424-82-6	0.031	0.087
		p,p'-DDE	72-55-9	0.031	0.087
U062	Diallate	Diallate	2303-16-4	(WETOX or CHOXD) fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
				CARBN; or CMBST	
U063	Dibenz(a,h)anthracene	Dibenz(a,h)anthracene	53-70-3	0.055	8.2
U064	Dibenz(a,i)pyrene	Dibenz(a,i)pyrene	189-55-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U066	1,2-Dibromo-3-chloropropane	1,2-Dibromo-3-chloropropane	96-12-8	0.11	15
U067	Ethylene dibromide (1,2-Dibromoethane)	Ethylene dibromide (1,2-Dibromoethane)	106-93-4	0.028	15
U068	Dibromomethane	Dibromomethane	74-95-3	0.11	15
U069	Di-n-butyl phthalate	Di-n-butyl phthalate	84-74-2	0.057	28
U070	o-Dichlorobenzene	o-Dichlorobenzene	95-50-1	0.088	6.0
U071	m-Dichlorobenzene	m-Dichlorobenzene	541-73-1	0.036	6.0
U072	p-Dichlorobenzene	p-Dichlorobenzene	106-46-7	0.090	6.0
U073	3,3'-Dichlorobenzidine	3,3'-Dichlorobenzidine	91-94-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U074	1,4-Dichloro-2-butene	cis-1,4-Dichloro-2-butene	1476-11-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
		trans-1,4-Dichloro-2-butene	764-41-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U075	Dichlorodifluoromethane	Dichlorodifluoromethane	75-71-8	0.23	7.2
U076	1,1-Dichloroethane	1,1-Dichloroethane	75-34-3	0.059	6.0
U077	1,2-Dichloroethane	1,2-Dichloroethane	107-06-2	0.21	6.0
U078	1,1-Dichloroethylene	1,1-Dichloroethylene	75-35-4	0.025	6.0
U079	1,2-Dichloroethylene	trans-1,2-Dichloroethylene	156-60-5	0.054	30
U080	Methylene chloride	Methylene chloride	75-09-2	0.089	30
U081	2,4-Dichlorophenol	2,4-Dichlorophenol	120-83-2	0.044	14
U082	2,6-Dichlorophenol	2,6-Dichlorophenol	87-65-0	0.044	14
U083	1,2-Dichloropropane	1,2-Dichloropropane	78-87-5	0.85	18
U084	1,3-Dichloropropylene	cis-1,3-Dichloropropylene	10061-01-5	0.036	18
		trans-1,3-Dichloropropylene	10061-02-6	0.036	18
U085	1,2,3,4-Diepoxybutane	1,2,3,4-Diepoxybutane	1464-53-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U086	N,N'-Diethylhydrazine	N,N'-Diethylhydrazine	1615-80-1	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U087	O,O-Diethyl S-methyldithiophosphate	O,O-Diethyl S-methyldithiophosphate	3288-58-2	CARBAN; or CMBST	CMBST
U088	Diethyl phthalate	Diethyl phthalate	84-66-2	0.20	28
U089	Diethyl stilbestrol	Diethyl stilbestrol	56-53-1	(WETOX or CHOXD) fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
				CARBN; or CMBST	
U090	Dihydrosofrole	Dihydrosofrole	94-58-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U091	3,3'-Dimethoxybenzidine	3,3'-Dimethoxybenzidine	119-90-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U092	Dimethylamine	Dimethylamine	124-40-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U093	p-Dimethylaminoazobenzene	p-Dimethylaminoazobenzene	60-11-7	0.13	CMBST
U094	7,12-Dimethylbenz(a)anthracene	7,12-Dimethylbenz(a)anthracene	57-97-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U095	3,3'-Dimethylbenzidine	3,3'-Dimethylbenzidine	119-93-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U096	alpha, alpha-Dimethyl benzyl hydroperoxide	alpha, alpha-Dimethyl benzyl hydroperoxide	119-93-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U097	Dimethylcarbamoyl chloride	Dimethylcarbamoyl chloride	79-44-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U098	1,1-Dimethylhydrazine	1,1-Dimethylhydrazine	57-14-7	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U099	1,2-Dimethylhydrazine	1,2-Dimethylhydrazine	540-73-8	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U101	2,4-Dimethylphenol	2,4-Dimethylphenol	105-67-9	0.036	14
U102	Dimethyl phthalate	Dimethyl phthalate	131-11-3	0.047	28
U103	Dimethyl sulfate	Dimethyl sulfate	77-78-1	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U105	2,4-Dinitrotoluene	2,4-Dinitrotoluene	121-14-2	0.32	140
U106	2,6-Dinitrotoluene	2,6-Dinitrotoluene	606-20-2	0.55	28
U107	Di-n-octyl phthalate	Di-n-octyl phthalate	117-84-0	0.017	28
U108	1,4-Dioxane	1,4-Dioxane	123-91-1	(WETOX or CHOXD) fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
				CARBN; or CMBST	
		1,4-Dioxane; alternate ⁶	123-91-1	12.0	170
U109	1,2-Diphenylhydrazine	1,2-Diphenylhydrazine	122-66-7	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
		1,2-Diphenylhydrazine; alternate ⁶ standard for wastewaters only	122-66-7	0.087	NA
U110	Dipropylamine	Dipropylamine	142-84-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U111	Di-n-propylnitrosamine	Di-n-propylnitrosamine	621-64-7	0.40	14
U112	Ethyl acetate	Ethyl acetate	141-78-6	0.34	33
U113	Ethyl acrylate	Ethyl acrylate	140-88-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U114	Ethylenebisdithiocarbamic acid salts and esters	Ethylenebisdithiocarbamic acid	111-54-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U115	Ethylene oxide	Ethylene oxide	75-21-8	(WETOX or CHOXD) fb CARBN; or CMBST	CHOXD; or CMBST
		Ethylene oxide; alternate ⁶ standard for wastewaters only	75-21-8	0.12	NA
U116	Ethylene thiourea	Ethylene thiourea	96-45-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U117	Ethyl ether	Ethyl ether	60-29-7	0.12	160
U118	Ethyl methacrylate	Ethyl methacrylate	97-63-2	0.14	160
U119	Ethyl methane sulfonate	Ethyl methane sulfonate	62-50-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U120	Fluoranthene	Fluoranthene	206-44-0	0.068	3.4
U121	Trichloromonofluoromethane	Trichloromonofluoromethane	75-69-4	0.020	30
U122	Formaldehyde	Formaldehyde	50-00-0	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U123	Formic acid	Formic acid	64-18-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U124	Furan	Furan	110-00-9	(WETOX or CHOXD) fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ² in mg/l, or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
				CARBN; or CMBST	
U125	Furfural	Furfural	98-01-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U126	Glycidylaldehyde	Glycidylaldehyde	765-34-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U127	Hexachlorobenzene	Hexachlorobenzene	118-74-1	0.055	10
U128	Hexachlorobutadiene	Hexachlorobutadiene	87-68-3	0.055	5.6
U129	Lindane	alpha-BHC	319-84-6	0.00014	0.066
		beta-BHC	319-85-7	0.00014	0.066
		delta-BHC	319-86-8	0.023	0.066
		gamma-BHC (Lindane)	58-89-9	0.0017	0.066
U130	Hexachlorocyclopentadiene	Hexachlorocyclopentadiene	77-47-4	0.057	2.4
U131	Hexachloroethane	Hexachloroethane	67-72-1	0.055	30
U132	Hexachlorophene	Hexachlorophene	70-30-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U133	Hydrazine	Hydrazine	302-01-2	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U134	Hydrogen fluoride	Fluoride (measured in wastewaters only)	7664-39-3	35	ADGAS fb NEUTR; or NEUTR
U135	Hydrogen Sulfide	Hydrogen Sulfide	7783-06-4	CHOXD; CHRED; or CMBST	CHOXD; CHRED; or CMBST
U136	Cacodylic acid	Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
U137	Indeno(1,2,3-cd)pyrene	Indeno(1,2,3-cd)pyrene	193-39-5	0.0055	3.4
U138	Iodomethane	Iodomethane	74-88-4	0.19	65
U140	Isobutyl alcohol	Isobutyl alcohol	78-83-1	5.6	170
U141	Isosafrole	Isosafrole	120-58-1	0.081	2.6
U142	Kepone	Kepone	143-50-8	0.0011	0.13
U143	Lasiocarpine	Lasiocarpine	303-34-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U144	Lead acetate	Lead	7439-92-1	0.69	0.75 mg/l TCLP
U145	Lead phosphate	Lead	7439-92-1	0.69	0.75 mg/l TCLP
U146	Lead subacetate	Lead	7439-92-1	0.69	0.75 mg/l TCLP
U147	Maleic anhydride	Maleic anhydride	108-31-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
U148	Maleic hydrazide	Maleic hydrazide	123-33-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U149	Malononitrile	Malononitrile	109-77-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U150	Melphalan	Melphalan	148-82-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U151	U151 (mercury) nonwastewaters that contain greater than or equal to 260 mg/kg total mercury.	Mercury	7439-97-6	NA	RMERC
	U151 (mercury) nonwastewaters that contain less than 260 mg/kg total mercury and that are residues from RMERC only.	Mercury	7439-97-6	NA	0.20 mg/l TCLP
	U151 (mercury) nonwastewaters that contain less than 260 mg/kg total mercury and that are not residues from RMERC.	Mercury	7439-97-6	NA	0.025 mg/l TCLP
	All U151 (mercury) wastewaters.	Mercury	7439-97-6	0.15	NA
	Elemental Mercury Contaminated with Radioactive Materials	Mercury	7439-97-6	NA	AMLGM
U152	Methacrylonitrile	Methacrylonitrile	126-98-7	0.24	84
U153	Methanethiol	Methanethiol	74-93-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U154	Methanol	Methanol	67-56-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
		Methanol; alternate ⁶ set of standards for both wastewaters and nonwastewaters	67-56-1	5.6	0.75 mg/l TCLP
U155	Methacrylonitrile	Methacrylonitrile	91-80-5	0.081	1.5
U156	Methyl chlorocarbonate	Methyl chlorocarbonate	79-22-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U157	3-Methylcholanthrene	3-Methylcholanthrene	56-49-5	0.0055	15
U158	4,4'-Methylene bis(2-chloroaniline)	4,4'-Methylene bis(2-chloroaniline)	101-14-4	0.50	30
U159	Methyl ethyl ketone	Methyl ethyl ketone	78-93-3	0.28	36
U160	Methyl ethyl ketone peroxide	Methyl ethyl ketone peroxide	1338-23-4	CHOXD; CHRED; CARBN; BIODG; or CMBST	CHOXD; CHRED; or CMBST
U161	Methyl isobutyl ketone	Methyl isobutyl ketone	108-10-1	0.14	33
U162	Methyl methacrylate	Methyl methacrylate	80-62-6	0.14	160

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
U163	N-Methyl N'-nitro N-nitrosoguanidine	N-Methyl N'-nitro N-nitrosoguanidine	70-25-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U164	Methylthiouracil	Methylthiouracil	56-04-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U165	Naphthalene	Naphthalene	91-20-3	0.059	5.6
U166	1,4-Naphthoquinone	1,4-Naphthoquinone	130-15-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U167	1-Naphthylamine	1-Naphthylamine	134-32-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U168	2-Naphthylamine	2-Naphthylamine	91-59-8	0.52	CMBST
U169	Nitrobenzene	Nitrobenzene	98-95-3	0.068	14
U170	p-Nitrophenol	p-Nitrophenol	100-02-7	0.12	29
U171	2-Nitropropane	2-Nitropropane	79-46-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U172	N-Nitrosodi-n-butylamine	N-Nitrosodi-n-butylamine	924-16-3	0.40	17
U173	N-Nitrosodiethanolamine	N-Nitrosodiethanolamine	1116-54-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U174	N-Nitrosodiethylamine	N-Nitrosodiethylamine	55-18-5	0.40	28
U176	N-Nitroso-N-ethylurea	N-Nitroso-N-ethylurea	759-73-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U177	N-Nitroso-N-methylurea	N-Nitroso-N-methylurea	684-93-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U178	N-Nitroso-N-methylurethane	N-Nitroso-N-methylurethane	615-53-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U179	N-Nitrosopiperidine	N-Nitrosopiperidine	100-75-4	0.013	35
U180	N-Nitrosopyrrolidine	N-Nitrosopyrrolidine	930-55-2	0.013	35
U181	5-Nitro-o-toluidine	5-Nitro-o-toluidine	99-55-8	0.32	28
U182	Paraldehyde	Paraldehyde	123-63-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U183	Pentachlorobenzene	Pentachlorobenzene	608-93-5	0.055	10
U184	Pentachloroethane	Pentachloroethane	76-01-7	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l; or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
		Pentachloroethane; alternate ⁶ standards for both wastewaters and nonwastewaters	76-01-7	0.055	6.0
U185	Pentachloronitrobenzene	Pentachloronitrobenzene	82-68-8	0.055	4.8
U186	1,3-Pentadiene	1,3-Pentadiene	504-60-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U187	Phenacetin	Phenacetin	62-44-2	0.081	16
U188	Phenol	Phenol	108-95-2	0.039	6.2
U189	Phosphorus sulfide	Phosphorus sulfide	1314-80-3	CHOXD; CHRED; or CMBST	CHOXD; CHRED; or CMBST
U190	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	100-21-0	0.055	28
		Phthalic anhydride (measured as Phthalic acid or Terephthalic acid)	85-44-9	0.055	28
U191	2-Picoline	2-Picoline	109-06-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U192	Pronamide	Pronamide	23950-58-5	0.093	1.5
U193	1,3-Propane sultone	1,3-Propane sultone	1120-71-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U194	n-Propylamine	n-Propylamine	107-10-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U196	Pyridine	Pyridine	110-86-1	0.014	16
U197	p-Benzoquinone	p-Benzoquinone	106-51-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U200	Reserpine	Reserpine	50-55-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U201	Resorcinol	Resorcinol	108-46-3	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U203	Safrole	Safrole	94-59-7	0.081	22
U204	Selenium dioxide	Selenium	7782-49-2	0.82	5.7 mg/l TCLP
U205	Selenium sulfide	Selenium	7782-49-2	0.82	5.7 mg/l TCLP
U206	Streptozotocin	Streptozotocin	18883-66-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U207	1,2,4,5-Tetrachlorobenzene	1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
U208	1,1,1,2-Tetrachloroethane	1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
U209	1,1,2,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	79-34-5	0.057	6.0
U210	Tetrachloroethylene	Tetrachloroethylene	127-18-4	0.056	6.0

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ³ in mg/l, or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
U211	Carbon tetrachloride	Carbon tetrachloride	56-23-5	0.057	6.0
U213	Tetrahydrofuran	Tetrahydrofuran	109-99-9	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U214	Thallium (I) acetate	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL
U215	Thallium (I) carbonate	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL
U216	Thallium (I) chloride	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL
U217	Thallium (I) nitrate	Thallium (measured in wastewaters only)	7440-28-0	1.4	RTHRM; or STABL
U218	Thioacetamide	Thioacetamide	62-55-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U219	Thiourea	Thiourea	62-56-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U220	Toluene	Toluene	108-88-3	0.080	10
U221	Toluenediamine	Toluenediamine	25376-45-8	CARBN; or CMBST	CMBST
U222	o-Toluidine hydrochloride	o-Toluidine hydrochloride	636-21-5	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U223	Toluene diisocyanate	Toluene diisocyanate	26471-62-5	CARBN; or CMBST	CMBST
U225	Bromoform (Tribromomethane)	Bromoform (Tribromomethane)	75-25-2	0.63	15
U226	1,1,1-Trichloroethane	1,1,1-Trichloroethane	71-55-6	0.054	6.0
U227	1,1,2-Trichloroethane	1,1,2-Trichloroethane	79-00-5	0.054	6.0
U228	Trichloroethylene	Trichloroethylene	79-01-6	0.054	6.0
U234	1,3,5-Trinitrobenzene	1,3,5-Trinitrobenzene	99-35-4	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U235	tris-(2,3-Dibromopropyl)-phosphate	tris-(2,3-Dibromopropyl)-phosphate	126-72-7	0.11	0.10
U236	Trypan Blue	Trypan Blue	72-57-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U237	Uracil mustard	Uracil mustard	66-75-1	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U238	Urethane (Ethyl carbamate)	Urethane (Ethyl carbamate)	51-79-6	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U239	Xylenes	Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters	Non waste waters
		Common Name	CAS ² Number	Concentration ⁵ in mg/l; or Technology Code ⁴	Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
U240	2,4-D (2,4-Dichlorophenoxyacetic acid)	2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7	0.72	10
	2,4-D (2,4-Dichlorophenoxyacetic acid) salts and esters		NA	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U243	Hexachloropropylene	Hexachloropropylene	1888-71-7	0.035	30
U244	Thiram	Thiram	137-26-8	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U246	Cyanogen bromide	Cyanogen bromide	506-68-3	CHOXD; WETOX; or CMBST	CHOXD; WETOX; or CMBST
U247	Methoxychlor	Methoxychlor	72-43-5	0.25	0.18
U248	Warfarin, & salts, when present at concentrations of 0.3% or less	Warfarin	81-81-2	(WETOX or CHOXD) fb CARBN; or CMBST	CMBST
U249	Zinc phosphide, Zn ₃ P ₂ , when present at concentrations of 10% or less	Zinc Phosphide	1314-84-7	CHOXD; WETOX; or CMBST	CHOXD; WETOX; or CMBST
U271	Benomyl ¹⁰	Benomyl	17804-35-2	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U278	Bendiocarb ¹⁰	Bendiocarb	22781-23-3	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U279	Carbaryl ¹⁰	Carbaryl	63-25-2	0.006; or CMBST, CHOXD, BIODG or CARBN	0.14; or CMBST
U280	Barban ¹⁰	Barban	101-27-9	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U328	o-Toluidine	o-Toluidine	95-53-4	CMBST; or CHOXD fb (BIODG or CARBN); or BIODG fb CARBN.	CMBST
U353	p-Toluidine	p-Toluidine	106-49-0	CMBST; or CHOXD fb (BIODG or CARBN); or BIODG fb	CMBST

268.40 – Treatment Standards for Hazardous Waste

WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ⁵ in mg/l, or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
				CARBN	
U359	2-Ethoxyethanol	2-Ethoxyethanol	110-80-5	CMBST; or CHOXD fb (BIODG or CARBN); or BIODG fb CARBN	CMBST
U364	Bendiocarb phenol ¹⁰	Bendiocarb phenol	22961-82-6	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U367	Carbofuran phenol ¹⁰	Carbofuran phenol	1563-38-8	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U372	Carbendazim ¹⁰	Carbendazim	10605-21-7	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U373	Propham ¹⁰	Propham	122-42-9	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U387	Prosulfocarb ¹⁰	Prosulfocarb	52888-80-9	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U389	Triallate ¹⁰	Triallate	2303-17-5	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U394	A2213 ¹⁰	A2213	30558-43-1	0.042; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U395	Diethylene glycol, dicarbamate ¹⁰	Diethylene glycol, dicarbamate	5952-26-1	0.056; or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U404	Triethylamine ¹⁰	Triethylamine	101-44-8	0.081; or CMBST, CHOXD, BIODG or CARBN	1.5; or CMBST
U409	Thiophanate-methyl ¹⁰	Thiophanate-methyl	23564-05-8	0.056; or CMBST,	1.4; or CMBST

268.40 – Treatment Standards for Hazardous Waste					
WASTE CODE	Waste Description And Treatment/Regulatory Subcategory ¹ (11/99, 8/00, 6/04, 2/07) NOTE: fb means followed by	Regulated hazardous constituent NOTE: NA means not applicable		Waste waters Concentration ³ in mg/l, or Technology Code ⁴	Non waste waters Concentration ⁵ in mg/kg unless noted as mg/l TCLP or Technology Code ⁴
		Common Name	CAS ² Number		
				CHOXD, BIODG or CARBN	
U410	Thiodicarb ¹⁰	Thiodicarb	59669-26-0	0.019, or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST
U411	Propoxur ¹⁰	Propoxur	114-26-1	0.056, or CMBST, CHOXD, BIODG or CARBN	1.4; or CMBST

Footnotes to Treatment Standard Table 268.40

1 The waste descriptions provided in this table do not replace waste descriptions in 261. Descriptions of Treatment /Regulatory Subcategories are provided, as needed, to distinguish between applicability of different standards.

2 CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.

3 Concentration standards for wastewaters are expressed in mg/l and are based on analysis of composite samples.

4 All treatment standards expressed as a Technology Code or combination of Technology Codes are explained in detail in 268.42 Table 1 — Technology Codes and Descriptions of Technology-Based Standards.

5 Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance with the technical requirements of Part 264 Subpart O or Part 265 Subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

6 Where an alternate treatment standard or set of alternate standards has been indicated, a facility may comply with this alternate standard, but only for the Treatment/Regulatory Subcategory or physical form (i.e., wastewater and/or nonwastewater) specified for that alternate standard.

7 Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010C or 9012B, found in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, as incorporated by reference in 260.11, with a sample size of 10 grams and a distillation time of one hour and 15 minutes. (2/07)

8 These wastes, when rendered nonhazardous and then subsequently managed in CWA, or CWA-equivalent systems, are not subject to treatment standards. (See 268.1(c)(3) and (4)), (See R.61–87.11.D.2).

9 [Reserved 8/00]

10 The treatment standard for this waste may be satisfied by either meeting the constituent concentrations in this table or by treating the waste by the specified technologies: combustion, as defined by the technology code CMBST at 268.42 Table 1 of this Part, for nonwastewaters; and, biodegradation as defined by the technology code BIODG, carbon adsorption as defined by the technology code CARBN, chemical oxidation as defined by the technology code CHOXD, or combustion as defined as technology code CMBST at 268.42 Table 1 of this Part, for wastewaters. (8/00)

11 For these wastes, the definition of CMBST is limited to: (1) combustion units operating under 266, (2) combustion units permitted under Part 264, Subpart O, or (3) combustion units operating under 265, Subpart O, which have obtained a determination of equivalent treatment under 268.42(b). [Note: NA means not applicable]

12 Disposal of K175 wastes that have complied with all applicable 268.40 treatment standards must also be microencapsulated in accordance with 268.45 Table 1 unless the waste is placed in:

(1) A Subtitle C monofill containing only K175 wastes that meet all applicable 268.40 treatment standards; or

(2) A dedicated Subtitle C landfill cell in which all other wastes being co-disposed are at pH 6.0.

Note: The treatment standards that heretofore appeared in tables in 268.41, 268.42, and 268.43 of this part have been consolidated into the table "Treatment Standards for Hazardous Wastes."

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 31, Issue No. 2, eff February 23, 2007; Amended by State Register Volume 36, Issue No. 9, eff September 28, 2012; State Register Volume 39, Issue No. 6, Doc. No. 4541, eff June 26, 2015; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

268.41. Treatment standards expressed as concentrations in waste extract.

For the requirements previously found in this section and for treatment standards in Table CCWE-Constituent Concentrations in Waste Extracts, refer to 268.40. (major revision 5/96)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996.

268.42. Treatment standards expressed as specified technologies.

Note: For the requirements previously found in this section in Table 2 - Technology-Based Standards By RCRA Waste Code, and Table 3 - Technology-Based Standards for Specific Radioactive Hazardous Mixed Waste, refer to 268.40

(a) The following wastes in the table in 268.40 "Treatment Standards for Hazardous Wastes." for which standards are expressed as a treatment method rather than a concentration level, must be treated using the technology or technologies specified in the table entitled "Technology Codes and Descriptions of Technology-Based Standards" in this section. (revised 12/92; 5/96)

268.42(a) Table 1—Technology Codes and Description of Technology-Based Standards	
Technology code	Description of technology-based standards (9/98)
ADGAS:	Venting of compressed gases into an absorbing or reacting media (i.e., solid or liquid)-venting can be accomplished through physical release utilizing valves/piping; physical penetration of the container; and/or penetration through detonation.
AMLGM:	Amalgamation of liquid, elemental mercury contaminated with radioactive materials utilizing inorganic reagents such as copper, zinc, nickel, gold, and sulfur that result in a nonliquid, semi-solid amalgam and thereby reducing potential emissions of elemental mercury vapors to the air.
BIODG:	Biodegradation of organics or non-metallic inorganics (i.e., degradable inorganics that contain the elements of phosphorus, nitrogen, and sulfur) in units operated under either aerobic or anaerobic conditions such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the biodegradation of many organic constituents that cannot be directly analyzed in wastewater residues).
CARBN:	Carbon adsorption (granulated or powdered) of non-metallic inorganics, organo-metallics, and/or organic constituents, operated such that a surrogate compound or

268.42(a) Table 1—Technology Codes and Description of Technology-Based Standards

Technology code	Description of technology-based standards (9/98)
	indicator parameter has not undergone breakthrough (e.g., Total Organic Carbon can often be used as an indicator parameter for the adsorption of many organic constituents that cannot be directly analyzed in wastewater residues). Breakthrough occurs when the carbon has become saturated with the constituent (or indicator parameter) and substantial change in adsorption rate associated with that constituent occurs.
CHOXD:	Chemical or electrolytic oxidation utilizing the following oxidation reagents (or waste reagents) or combinations of reagents: (1) Hypochlorite (e.g. bleach); (2) chlorine; (3) chlorine dioxide; (4) ozone or UV (ultraviolet light) assisted ozone; (5) peroxides; (6) persulfates; (7) perchlorates; (8) permangantes; and/or (9) other oxidizing reagents of equivalent efficiency, performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the oxidation of many organic constituents that cannot be directly analyzed in wastewater residues). Chemical oxidation specifically includes what is commonly referred to as alkaline chlorination.
CHRED:	Chemical reduction utilizing the following reducing reagents (or waste reagents) or combinations of reagents: (1) Sulfur dioxide; (2) sodium, potassium, or alkali salts or sulfites, bisulfites, metabisulfites, and polyethylene glycols (e.g., NaPEG and KPEG); (3) sodium hydrosulfide; (4) ferrous salts; and/or (5) other reducing reagents of equivalent efficiency, performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Halogens can often be used as an indicator parameter for the reduction of many halogenated organic constituents that cannot be directly analyzed in wastewater residues). Chemical reduction is commonly used for the reduction of hexavalent chromium to the trivalent state.
CMBST:	High temperature organic destruction technologies, such as combustion in incinerators, boilers, or industrial furnaces operated in accordance with the applicable requirements of part 264, Subpart O, or part 265, subpart O, or 266, Subpart H, and in other units operated in accordance with applicable technical operating requirements; and certain non-combustive technologies, such as the Catalytic Extraction Process. (5/96, 9/98)
DEACT:	Deactivation to remove the hazardous characteristics of a waste due to its ignitability, corrosivity, and/or reactivity.
FSUBS:	Fuel substitution in units operated in accordance with applicable technical operating requirements.
HLVIT:	Vitrification of high level mixed radioactive wastes in units in compliance with all applicable radioactive protection requirements under control of the Nuclear Regulatory Commission.
IMERC:	Incineration of wastes containing organics and mercury in units operated in accordance with the technical operating requirements of 264 subpart 0 and part 265 subpart 0. All wastewater and nonwastewater residues derived from this process must then comply with the corresponding treatment standards per waste code with consideration of any applicable subcategories (e.g., High or Low Mercury Subcategories).
INCIN:	Incineration in units operated in accordance with the technical operating requirements of 264 subpart 0 and part 265 subpart 0.
LLEXT:	Liquid-liquid extraction (often referred to as solvent extraction) of organics from liquid wastes into an immiscible solvent for which the hazardous constituents have a greater solvent affinity, resulting in an extract high in organics that must undergo either incineration, reuse as a fuel, or other recovery/reuse and a raffinate (extracted liquid waste) proportionately low in organics that must undergo further treatment as specified in the standard.
MACRO:	Macroencapsulation with surface coating materials such as polymeric organics (e.g. resins and plastics) or with a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media. Macroencapsulation specifically does not include any material that would be classified as a tank or container according to 260.10.

268.42(a) Table 1—Technology Codes and Description of Technology-Based Standards

Technology code	Description of technology-based standards (9/98)
NEUTR:	Neutralization with the following reagents (or waste reagents) or combinations of reagents: (1) Acids; (2) bases; or (3) water (including wastewaters) resulting in a pH greater than 2 but less than 12.5 as measured in the aqueous residuals.
NLDBR:	No land disposal based on recycling.
POLYM:	Formation of complex high-molecular weight solids through polymerization of monomers in high-TOC D001 non-wastewaters which are chemical components in the manufacture of plastics. (9/98)
PRECP:	Chemical precipitation of metals and other inorganics as insoluble precipitates of oxides, hydroxides, carbonates, sulfides, sulfates, chlorides, fluorides, or phosphates. The following reagents (or waste reagents) are typically used alone or in combination: (1) Lime (i.e., containing oxides and/or hydroxides of calcium and/or magnesium); (2) caustic (i.e., sodium and/or potassium hydroxides); (3) soda ash (i.e., sodium carbonate); (4) sodium sulfide; (5) ferric sulfate or ferric chloride; (6) alum; or (7) sodium sulfate. Additional flocculating, coagulation or similar reagents/processes that enhance sludge dewatering characteristics are not precluded from use.
RBERY:	Thermal recovery of Beryllium.
RCGAS:	Recovery/reuse of compressed gases including techniques such as reprocessing of the gases for reuse/resale; filtering/adsorption of impurities; remixing for direct reuse or resale; and use of the gas as a fuel source.
RCORR:	Recovery of acids or bases utilizing one or more of the following recovery technologies: (1) Distillation (i.e., thermal concentration); (2) ion exchange; (3) resin or solid adsorption; (4) reverse osmosis; and/or (5) incineration for the recovery of acid. Note: this does not preclude the use of other physical phase separation or concentration techniques such as decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RLEAD:	Thermal recovery of lead in secondary lead smelters.
RMERC:	Retorting or roasting in a thermal processing unit capable of volatilizing mercury and subsequently condensing the volatilized mercury for recovery. The retorting or roasting unit (or facility) must be subject to one or more of the following: (a) a National Emissions Standard for Hazardous Air Pollutants (NESHAP) for mercury; (b) a Best Available Control Technology (BACT) or a Lowest Achievable Emission Rate (LAER) standard for mercury imposed pursuant to a Prevention of Significant Deterioration (PSD) permit; or (c) a state permit that establishes emission limitations (within meaning of section 302 of the Clean Air Act) for mercury. All wastewater and nonwastewater residues derived from this process must then comply with the corresponding treatment standards per waste code with consideration of any applicable subcategories (e.g., High or Low Mercury Subcategories).
RMETL:	Recovery of metals or inorganics utilizing one or more of the following direct physical/removal technologies: (1) Ion exchange; (2) resin or solid (i.e., zeolites) adsorption; (3) reverse osmosis; (4) chelation/solvent extraction; (5) freeze crystallization; (6) ultrafiltration and/or (7) simple precipitation (i.e., crystallization) - Note: This does not preclude the use of other physical phase separation or concentration techniques such as decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RORGS:	Recovery of organics utilizing one or more of the following technologies: (1) Distillation; (2) thin film evaporation; (3) steam stripping; (4) carbon adsorption; (5) critical fluid extraction; (6) liquid-liquid extraction; (7) precipitation/crystallization (including freeze crystallization); or (8) chemical phase separation techniques (i.e., addition of acids, bases, demulsifiers, or similar chemicals); - Note: this does not preclude the use of other physical phase separation techniques such as a decantation, filtration (including ultrafiltration), and centrifugation, when used in conjunction with the above listed recovery technologies.
RTHRM:	Thermal recovery of metals or inorganics from nonwastewaters in units identified as industrial furnaces according to 260.10 (1), (6), (7), (11), and (12) under the definition of "industrial furnaces".
RZINC:	Resmelting in high temperature metal recovery units for the purpose of recovery of zinc.
STABL:	Stabilization with the following reagents (or waste reagents) or combinations of reagents: (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust) - this does not preclude the addition of reagents (e.g., iron salts, silicates, and

268.42(a) Table 1—Technology Codes and Description of Technology-Based Standards

Technology code	Description of technology-based standards (9/98)
	clays) designed to enhance the set/cure time and/or compressive strength, or to overall reduce the leachability of the metal or inorganic.
SSTRP:	Steam stripping of organics from liquid wastes utilizing direct application of steam to the wastes operated such that liquid and vapor flow rates, as well as temperature and pressure ranges, have been optimized, monitored, and maintained. These operating parameters are dependent upon the design parameters of the unit, such as the number of separation stages and the internal column design, thus resulting in a condensed extract high in organics that must undergo either incineration, reuse as a fuel, or other recovery/reuse and an extracted wastewater that must undergo further treatment as specified in the standard.
WETOX:	Wet air oxidation performed in units operated such that a surrogate compound or indicator parameter has been substantially reduced in concentration in the residuals (e.g., Total Organic Carbon can often be used as an indicator parameter for the oxidation of many organic constituents that cannot be directly analyzed in wastewater residues).
WTRRX:	Controlled reaction with water for highly reactive inorganic or organic chemicals with precautionary controls for protection of workers from potential violent reactions as well as precautionary controls for potential emissions of toxic/ignitable levels of gases released during the reaction.

Note 1: When a combination of these technologies (i.e., a treatment train) is specified as a single treatment standard, the order of application is specified in 268.42, Table 2 by indicating the five letter technology code that must be applied first, then the designation “fb.” (an abbreviation for “followed by”), then the five letter technology code for the technology that must be applied next, and so on.

[Note: For the requirements previously found in this section in Table 2 - Technology-Based Standards By RCRA Waste Code, and Table 3 - Technology- Based Standards for Specific Radioactive Hazardous Mixed Waste, refer to 268.40 effective 5/96). 268.42 Table 3. Technology-Based Standards for Specific Radioactive Hazardous Mixed Waste removed 5/96]

(b) Any person may submit an application to the Department and the Regional Administrator demonstrating that an alternative treatment method can achieve a measure of performance equivalent to that achieved by methods specified in paragraphs (a), (c), and (d) of this section for wastes or specified in Table 1 of § 268.45 for hazardous debris. The applicant must submit information demonstrating that his treatment method is in compliance with federal, state, and local requirements and is protective of human health and the environment. On the basis of such information and any other available information, the Department and the Regional Administrator may approve the use of the alternative treatment method if it finds that the alternative treatment method provides a measure of performance equivalent to that achieved by methods specified in paragraphs (a), (c), and (d) of this section for wastes or in Table 1 of 268.45 for hazardous debris. Any approval must be stated in writing and may contain such provisions and conditions as the Department and the Regional Administrator deems appropriate. The person to whom such approval is issued must comply with all limitations contained in such a determination.

(c) As an alternative to the otherwise applicable Subpart D treatment standards, lab packs are eligible for land disposal provided the following requirements are met:

- (1) The lab packs comply with the applicable provisions of 264.316 and 265.316;
- (2) The lab packs do not contain any of the wastes listed in Appendix IV to part 268. (revised 5/96)
- (3) The lab packs are incinerated in accordance with the requirements of part 264, subpart O or part 265, subpart O; and
- (4) Any incinerator residues from lab packs containing D004, D005, D006, D007, D008, D010, and D011 are treated in compliance with the applicable treatment standards specified for such wastes in subpart D of this part.

(d) Radioactive hazardous mixed wastes are subject to the treatment standards in 268.40. Where treatment standards are specified for radioactive mixed wastes in the Table of Treatment Standards, those treatment standards will govern. Where there is no specific treatment standard for radioactive mixed waste, the treatment standard for the hazardous waste (as designated by EPA waste code)

applies. Hazardous debris containing radioactive waste is subject to the treatment standards specified in 268.45. (revised 12/93; 5/96)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999.

268.43. Treatment standards expressed as waste concentrations.

For the requirements previously found in this section and for treatment standards in Table CCW-Constituent Concentrations in Wastes, refer to 268.40.

HISTORY: Added by State Register Volume 14, Issue No. 11, eff November 23, 1990; amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996.

268.44. Variance from a treatment standard.

(a) Based on a petition filed by a generator or treater of hazardous waste, the Administrator may approve a variance from an applicable treatment standard if:

(1) It is not physically possible to treat the waste to the level specified in the treatment standard, or by the method specified as the treatment standard. To show that this is the case, the petitioner must demonstrate that because the physical or chemical properties of the waste differ significantly from waste analyzed in developing the treatment standard, the waste cannot be treated to the specified level or by the specified method; or

(2) It is inappropriate to require the waste to be treated to the level specified in the treatment standard or by the method specified as the treatment standard, even though such treatment is technically possible. To show th this is the case, the petitioner must either demonstrate that:

(i) Treatment to the specified level or by the specified method is technically inappropriate (for example, resulting in combustion of large amounts of mildly contaminated environmental media where the treatment standard is not based on combustion of such media); or

(ii) For remediation waste only, treatment to the specified level or by the specified method is environmentally inappropriate because it would likely discourage aggressive remediation.

(b) Each petition must be submitted in accordance with the procedures in R.61-79.260.20.

(c) Each petition must include the following statement signed by the petitioner or an authorized representative: (amended 11/90)

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this petition and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. (amended 11/90)

(d) After receiving a petition for variance from a treatment standard, the Administrator may request any additional information or samples which he may require to evaluate the petition. Additional copies of the complete petition may be requested as needed to send to affected states and Regional Offices. (amended 11 90)

(e) The Regional Administrator will give public notice in the Federal Register of the intent to approve or deny a petition and provide an opportunity for public comment. The final decision on a variance from a treatment standard will be published in the Federal Register.

(f) A generator, treatment facility, or disposal facility that is managing a waste covered by a variance from the treatment standards must comply with the waste analysis requirements for restricted wastes found under section 268.7.

(g) During the petition review process, the applicant is required to comply with all restrictions on land disposal under this part once the effective date for the waste has been reached.

(h) Based on a petition filed by a generator or treater of hazardous waste, the Department may approve a site-specific variance from an applicable treatment standard if:

(1) It is not physically possible to treat the waste to the level specified in the treatment standard, or by the method specified as the treatment standard. To show that this is the case, the petitioner must demonstrate that because the physical or chemical properties of the waste differ significantly from waste analyzed in developing the treatment standard, the waste cannot be treated to the specified level or by the specified method; or

(2) It is inappropriate to require the waste to be treated to the level specified in the treatment standard or by the method specified as the treatment standard, even though such treatment is technically possible. To show that this is the case, the petitioner must either demonstrate that:

(i) Treatment to the specified level or by the specified method is technically inappropriate (for example, resulting in combustion of large amounts of mildly contaminated environmental media where the treatment standards is not based on combustion of such media); or

(ii) For remediation waste only, treatment to the specified level or by the specified method is environmentally inappropriate because it would likely discourage aggressive remediation.

(3) For contaminated soil only, treatment to the level or by the method specified in the soil treatment standards would result in concentrations of hazardous constituents that are below (i.e., lower than) the concentrations necessary to minimize short- and long-term threats to human health and the environment. Treatment variances approved under this paragraph must:

(i) At a minimum, impose alternative land disposal restriction treatment standards that, using a reasonable maximum exposure scenario:

(A) For carcinogens, achieve constituent concentrations that result in the total excess risk an individual exposed over a lifetime generally falling within a range from 10^{-4} to 10^{-6} ; and

(B) For constituents with non-carcinogenic effects, achieve constituent concentrations that an individual could be exposed to on a daily basis without appreciable risk of deleterious effect during a lifetime

(ii) Not consider post-land-disposal controls.

(4) For contaminated soil only, treatment to the level or by the method specified in the soil treatment standards would result in concentrations of hazardous constituents that are below (i.e., lower than) natural background concentrations at the site where the contaminated soil will land disposed.

(5) Public notice and a reasonable opportunity for public comment must be provided before granting or denying a petition.

(i) Each application for a site-specific variance from a treatment standard must include the information in 260.20(b)(1)(4). (amended 11/90)

(j) After receiving an application for a site-specific variance from a treatment standard, the EPA and the Department may request any additional information or samples which may be required to evaluate the application. (amended 11/90)

(k) A generator, treatment facility, or disposal facility that is managing a waste covered by a site-specific variance from a treatment standard must comply with the waste analysis requirements for restricted wastes found under 268.7.

(l) During the application review process, the applicant for a site-specific variance must comply with all restrictions on land disposal under this part once the effective date for the waste has been reached. (amended 11/90)

(m) For all variances, the petitioner must also demonstrate that compliance with any given treatment variance is sufficient to minimize threats to human health and the environment posed by land disposal of the waste. In evaluating this demonstration, the Department and EPA may take into account whether a treatment variance should be approved if the subject waste is to be used in a manner constituting disposal pursuant to 266.20 through 266.23.

(n) [Reserved]

(o) The following facilities are excluded from the treatment standards under 268.40, and are subject to the following constituent concentrations: (revised 12/92).

TABLE—WASTES EXCLUDED FROM THE TREATMENT STANDARDS UNDER 268.40

Facility name ¹ and address	Waste code	See also	Regulated hazardous constituent	Wastewaters		Nonwastewaters	
				Concentration (mg/l)	Notes	Concentration (mg/kg)	Notes
Craftsman Plating & Tinning, Corp., Chicago, IL.	F006	Table CCWE in 268.40	Cyanides (Total)	1.2	(2)	1800	(4)
			Cyanides (Amenable)	.86	(2&3)	30	(4)
			Cadmium	1.6	—	NA	—
			Chromium	.32	—	NA	—
			Lead	.040	—	NA	—
			Nickel	.44	—	NA	—
Northwestern Plating Works, Inc., Chicago, IL	F006	Table CCWE in 268.40	Cyanides (Total)	1.2	(2&3)	970	(4)
			Cyanides (Amenable)	.86	(2)	30	(4)
			Cadmium	1.6	—	NA	—
			Chromium	.32	—	NA	—
			Lead	.040	—	NA	—
			Nickel	.44	—	NA	—

FOOTNOTE: (1)-A facility may certify compliance with these treatment standards according to provisions in 268.7.

FOOTNOTE: (2)-Cyanide Wastewater Standards for F006 are based on analysis of composite samples.

FOOTNOTE: (3)-These facilities must comply with 0.86 mg/l for amenable cyanides in the wastewater exiting the alkaline chlorination system. These facilities must also comply with 268.7.a.4 for appropriate monitoring frequency consistent with the facilities' waste analysis plan.

FOOTNOTE: (4)-Cyanide nonwastewaters are analyzed using SW-846 Method 9010 or 9012, sample size 10 grams, distillation time, 1 hour and 15 minutes.

Note: NA means Not Applicable.

(p) [Removed]

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999.

268.45. Treatment standards for hazardous debris.

(a) Treatment standards. Hazardous debris must be treated prior to land disposal as follows unless the Department determines under 261.3(f)(2) of this chapter that the debris is no longer contaminated with hazardous waste or the debris is treated to the waste-specific treatment standard provided in this subpart for the waste contaminating the debris: (revised 5/96)

(1) General. Hazardous debris must be treated for each “contaminant subject to treatment” defined by paragraph (b) of this section using the technology or technologies identified in Table 1 of this section.

(2) Characteristic debris. Hazardous debris that exhibits the characteristic of ignitability, corrosivity, or reactivity identified under §§ 261.21, 261.22, and 261.23 of this chapter, respectively, must be deactivated by treatment using one of the technologies identified in Table 1 of this section.

(3) Mixtures of debris types. The treatment standards of Table 1 in this section must be achieved for each type of debris contained in a mixture of debris types. If an immobilization technology is used in a treatment train, it must be the last treatment technology used.

(4) Mixtures of contaminant types. Debris that is contaminated with two or more contaminants subject to treatment identified under paragraph (b) of this section must be treated for each contaminant using one or more treatment technologies identified in Table 1 of this section. If an immobilization technology is used in a treatment train, it must be the last treatment technology used.

(5) Waste PCB's. Hazardous debris that is also a waste PCB under 40 CFR part 761 is subject to the requirements of either 40 CFR part 761 or the requirements of this section, whichever are more stringent.

(b) Contaminants subject to treatment. Hazardous debris must be treated for each “contaminant subject to treatment.” The contaminants subject to treatment must be determined as follows:

(1) Toxicity characteristic debris. The contaminants subject to treatment for debris that exhibits the Toxicity Characteristic (TC) by § 261.24 of this chapter are those EP constituents for which the debris exhibits the TC toxicity characteristic.

(2) Debris contaminated with listed waste. The contaminants subject to treatment for debris that is contaminated with a prohibited listed hazardous waste are those constituents or wastes for which treatment standards are established for the waste under 268.40. (revised 5/96)

(3) Cyanide reactive debris. Hazardous debris that is reactive because of cyanide must be treated for cyanide.

(c) Conditioned exclusion of treated debris. Hazardous debris that has been treated using one of the specified extraction or destruction technologies in Table 1 of this section and that does not exhibit a characteristic of hazardous waste identified under subpart C, part 261, of this chapter after treatment is not a hazardous waste and need not be managed in a subtitle C facility. Hazardous debris contaminated with a listed waste that is treated by an immobilization technology specified in Table 1 is a hazardous waste and must be managed in a subtitle C facility.

(d) Treatment residuals-

(1) General requirements. Except as provided by paragraphs (d)(2) and (d)(4) of this section:

(i) Residue from the treatment of hazardous debris must be separated from the treated debris using simple physical or mechanical means; and

(ii) Residue from the treatment of hazardous debris is subject to the waste-specific treatment standards provided by subpart D of this part for the waste contaminating the debris.

(2) Nontoxic debris. Residue from the deactivation of ignitable, corrosive, or reactive characteristic hazardous debris (other than cyanide-reactive) that is not contaminated with a contaminant subject to treatment defined by paragraph (b) of this section, must be deactivated prior to land disposal and is not subject to the waste-specific treatment standards of subpart D of this part.

(3) Cyanide-reactive debris. Residue from the treatment of debris that is reactive because of cyanide must meet the treatment standards for D003 in "Treatment Standards for Hazardous Wastes" at 268.40.

(4) Ignitable nonwastewater residue. Ignitable nonwastewater residue containing equal to or greater than 10% total organic carbon is subject to the technology specified in the treatment standard for D001: Ignitable Liquids.

(5) Residue from spalling. Layers of debris removed by spalling are hazardous debris that remain subject to the treatment standards of this section.

Appendix A-10: 268.45(d)(5)—Table 1.—Alternative Treatment Standards For Hazardous Debris ¹

Table 1.—Alternative Treatment Standards For Hazardous Debris ¹

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
A. Extraction Technologies:		
1. Physical Extraction		
a. Abrasive Blasting: Removal of contaminated debris surface layers using water and/or air pressure to propel a solid media (e.g., steel shot, aluminum oxide grit, plastic beads).	Glass, Metal, Plastic, Rubber: Treatment to a clean debris surface. ³ Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Removal of at least 0.6 cm of the surface layer; treatment to a clean debris surface. ³	All Debris: None.
b. Scarification, Grinding, and Planing: Process utilizing striking piston heads, saws, or rotating grinding wheels such that contaminat-	Same as above	Same as above

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
ed debris surface layers are removed.		
c. Spalling: Drilling or chipping holes at appropriate locations and depth in the contaminated debris surface and applying a tool which exerts a force on the sides of those holes such that the surface layer is removed. The surface layer removed remains hazardous debris subject to the debris treatment standards.	Same as above	Same as above
d. Vibratory Finishing: Process utilizing scrubbing media, flushing fluid, and oscillating energy such that hazardous contaminants or contaminated debris surface layers are removed. ⁴	Same as above	Same as above
e. High Pressure Steam and Water Sprays: Application of water or steam sprays of sufficient temperature, pressure, residence time, agitation, surfactants, and detergents to remove hazardous contaminants from debris surfaces or to remove contaminated debris surface layers	Same as above	Same as above
2. Chemical Extraction		
a. Water Washing and Spraying: Application of water sprays or water baths of sufficient temperature, pressure, residence time, agitation, surfactants, acids, bases, and detergents to remove hazardous contaminants from debris surfaces and surface pores or to remove contaminated debris surface layers.	All Debris: Treatment to a clean debris surface ³ ; Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Debris must be no more than 1.2 cm (½ inch) in one dimension (i.e., thickness limit, ⁵ except that this thickness limit may be waived under an "Equivalent Technology" approval under 268.42(b); ⁵ debris surfaces must be in contact with water solution for at least 15 minutes	Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Contaminant must be soluble to at least 5% by weight in water solution or 5% by weight in emulsion; if debris is contaminated with a dioxin-listed waste, ⁶ an "Equivalent Technology" approval under 268.42(b) must be obtained. ⁸
b. Liquid Phase Solvent Extraction: Removal of hazardous contaminants from debris surfaces and surface pores by applying a nonaqueous liquid or liquid solution which causes the hazardous contaminants to	Same as above	Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Same as above, except that contaminant must be soluble to at least 5% by weight in the solvent.

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
enter the liquid phase and be flushed away from the debris along with the liquid or liquid solution while using appropriate agitation, temperature, and residence time. ⁴		
c. Vapor Phase Solvent Extraction: Application of an organic vapor using sufficient agitation, residence time, and temperature to cause hazardous contaminants on contaminated debris surfaces and surface pores to enter the vapor phase and be flushed away with the organic vapor. ⁴	Same as above, except that brick, cloth, concrete, paper, pavement, rock and wood surfaces must be in contact with the organic vapor for at least 60 minutes.	Same as above.
3. Thermal Extraction		
a. High Temperature Metals Recovery: Application of sufficient heat, residence time, mixing, fluxing agents, and/or carbon in a smelting, melting, or refining furnace to separate metals from debris.	For refining furnaces, treated debris must be separated from treatment residuals using simple physical or mechanical means, ⁹ and, prior to further treatment, such residuals must meet the waste-specific treatment standards for organic compounds in the waste contaminating the debris.	Debris contaminated with a dioxin-listed waste: ⁶ Obtain an "Equivalent Technology" approval under 268.42(b). ⁸
b. Thermal Desorption: Heating in an enclosed chamber under either oxidizing or nonoxidizing atmospheres at sufficient temperature and residence time to vaporize hazardous contaminants from contaminated surfaces and surface pores and to remove the contaminants from the heating chamber in a gaseous exhaust gas. ⁷	All Debris: Obtain an "Equivalent Technology" approval under 268.42(b); ⁸ treated debris must be separated from treatment residuals using simple physical or mechanical means, ⁹ and, prior to further treatment, such residue must meet the waste-specific treatment standards for organic compounds in the waste contaminating the debris. Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Debris must be no more than 10 cm (4 inches) in one dimension (i.e., thickness limit), ⁵ except that this thickness limit may be waived under the "Equivalent Technology" approval.	All Debris: Metals other than mercury.
B. Destruction Technologies:		
1. Biological Destruction (Biodegradation): Removal	All Debris: Obtain an "Equivalent Technology"	All Debris: Metal contaminants.

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
<p>of hazardous contaminants from debris surfaces and surface pores in an aqueous solution and biodegradation of organic or nonmetallic inorganic compounds (i.e., inorganics that contain phosphorus, nitrogen, or sulfur) in units operated under either aerobic or anaerobic conditions.</p>	<p>approval under 268.42(b); ⁸ treated debris must be separated from treatment residuals using simple physical or mechanical means,⁹ and, prior to further treatment, such residue must meet the waste-specific treatment standards for organic compounds in the waste contaminating the debris.</p> <p>Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Debris must be no more than 1.2 cm (½ inch) in one dimension (i.e., thickness limit),⁵ except that this thickness limit may be waived under the “Equivalent Technology” approval.</p>	
<p>2. Chemical Destruction</p>		
<p>a. Chemical Oxidation: Chemical or electrolytic oxidation utilizing the following oxidation reagents (or waste reagents) or combination of reagents—(1) hypochlorite (e.g., bleach); (2) chlorine; (3) chlorine dioxide; (4) ozone or UV (ultraviolet light) assisted ozone; (5) peroxides; (6) persulfates; (7) perchlorates; (8) permanganates; and/or (9) other oxidizing reagents of equivalent destruction efficiency.⁴ Chemical oxidation specifically includes what is referred to as alkaline chlorination.</p>	<p>All Debris: Obtain an “Equivalent Technology” approval under 268.42(b); ⁸ treated debris must be separated from treatment residuals using simple physical or mechanical means,³ and, prior to further treatment, such residue must meet the waste-specific treatment standards for organic compounds in the waste contaminating the debris.</p> <p>Brick, Cloth, Concrete, Paper, Pavement, Rock, Wood: Debris must be no more than 1.2 cm (½ inch) in one dimension (i.e., thickness limit),⁵ except that this thickness limit may be waived under the “Equivalent Technology” approval</p>	<p>All Debris: Metal contaminants.</p>
<p>b. Chemical Reduction: Chemical reaction utilizing the following reducing reagents (or waste reagents) or combination of reagents: (1) sulfur dioxide; (2) sodium, potassium, or alkali salts of sulfites, bisulfites, and metabisulfites, and polyethylene glycols (e.g., NaPEG and KPEG); (3) sodium hydrosulfide; (4) ferrous salts; and/or (5) other reducing reagents of equivalent efficiency.⁴</p>	<p>Same as above</p>	<p>Same as above.</p>

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
<p>3. Thermal Destruction: Treatment in an incinerator operating in accordance with Subpart O of Parts 264 or 265 of this chapter; a boiler or industrial furnace operating in accordance with Subpart H of Part 266 of this chapter, or other thermal treatment unit operated in accordance with Subpart X, Part 264 of this chapter, or Subpart P, Part 265 of this chapter, but excluding for purposes of these debris treatment standards Thermal Desorption units.</p>	<p>Treated debris must be separated from treatment residuals using simple physical or mechanical means,⁹ and, prior to further treatment, such residue must meet the waste-specific treatment standards for organic compounds in the waste contaminating the debris.</p>	<p>Brick, Concrete, Glass, Metal, Pavement, Rock, Metal: Metals other than mercury, except that there are no metal restrictions for vitrification. Debris contaminated with a dioxin-listed waste.⁶ Obtain an "Equivalent Technology" approval under 268.42(b),⁸ except that this requirement does not apply to vitrification.</p>
<p>C. Immobilization Technologies:</p>		
<p>1. Macroencapsulation: Application of surface coating materials such as polymeric organics (e.g., resins and plastics) or use of a jacket of inert inorganic materials to substantially reduce surface exposure to potential leaching media.</p>	<p>Encapsulating material must completely encapsulate debris and be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).</p>	<p>None.</p>
<p>2. Microencapsulation: Stabilization of the debris with the following reagents (or waste reagents) such that the leachability of the hazardous contaminants is reduced: (1) Portland cement; or (2) lime/pozzolans (e.g., fly ash and cement kiln dust). Reagents (e.g., iron salts, silicates, and clays) may be added to enhance the set/cure time and/or compressive strength, or to reduce the leachability of the hazardous constituents.⁵</p>	<p>Leachability of the hazardous contaminants must be reduced.</p>	<p>None.</p>
<p>3. Sealing: Application of an appropriate material which adheres tightly to the debris surface to avoid exposure of the surface to potential leaching media. When necessary to effectively seal the surface, sealing entails pretreatment of the debris surface to remove foreign matter and to clean and roughen the surface. Sealing materials include epoxy,</p>	<p>Sealing must avoid exposure of the debris surface to potential leaching media and sealant must be resistant to degradation by the debris and its contaminants and materials into which it may come into contact after placement (leachate, other waste, microbes).</p>	<p>None.</p>

Technology description	Performance and/or design and operating standard	Contaminant restrictions ²
silicone, and urethane compounds, but paint may not be used as a sealant		

FOOTNOTE: ¹ Hazardous debris must be treated by either these standards or the waste-specific treatment standards for the waste contaminating the debris. The treatment standards must be met for each type of debris contained in a mixture of debris types, unless the debris is converted into treatment residue as a result of the treatment process. Debris treatment residuals are subject to the waste-specific treatment standards for the waste contaminating the debris.

FOOTNOTE: ² Contaminant restriction means that the technology is not BDAT for that contaminant. If debris containing a restricted contaminant is treated by the technology, the contaminant must be subsequently treated by a technology for which it is not restricted in order to be land disposed (and excluded from Subtitle C regulation).

FOOTNOTE: ³ "Clean debris surface" means the surface, when viewed without magnification, shall be free of all visible contaminated soil and hazardous waste except that residual staining from soil and waste consisting of light shadows, slight streaks, or minor discolorations, and soil and waste in cracks, crevices, and pits may be present provided that such staining and waste and soil in cracks, crevices, and pits shall be limited to no more than 5% of each square inch of surface area.

FOOTNOTE: ⁴ Acids, solvents, and chemical reagents may react with some debris and contaminants to form hazardous compounds. For example, acid washing of cyanide-contaminated debris could result in the formation of hydrogen cyanide. Some acids may also react violently with some debris and contaminants, depending on the concentration of the acid and the type of debris and contaminants. Debris treaters should refer to the safety precautions specified in Material Safety Data Sheets for various acids to avoid applying an incompatible acid to a particular debris/contaminant combination. For example, concentrated sulfuric acid may react violently with certain organic compounds, such as acrylonitrile.

FOOTNOTE: ⁵ If reducing the particle size of debris to meet the treatment standards results in material that no longer meets the 60 mm minimum particle size limit for debris, such material is subject to the waste-specific treatment standards for the waste contaminating the material, unless the debris has been cleaned and separated from contaminated soil and waste prior to size reduction. At a minimum, simple physical or mechanical means must be used to provide such cleaning and separation of nondebris materials to ensure that the debris surface is free of caked soil, waste, or other nondebris material.

FOOTNOTE: ⁶ Dioxin-listed wastes are EPA Hazardous Waste numbers FO20, FO21, FO22, FO23, FO26, and FO27.

FOOTNOTE: ⁷ Thermal desorption is distinguished from Thermal Destruction in that the primary purpose of Thermal Desorption is to volatilize contaminants and to remove them from the treatment chamber for subsequent destruction or other treatment.

FOOTNOTE: ⁸ The demonstration "Equivalent Technology" under 268.42(b) must document that the technology treats contaminants subject to treatment to a level equivalent to that required by the performance and design and operating standards for other technologies in this table such that residual levels of hazardous contaminants will not pose a hazard to human health and the environment absent management controls.

FOOTNOTE: ⁹ Any soil, waste, and other nondebris material that remains on the debris surface (or remains mixed with the debris) after treatment is considered a treatment residual that must be separated from the debris using, at a minimum, simple physical or mechanical means. Examples of simple physical or mechanical means are vibratory or trommel screening or water washing. The debris surface need not be cleaned to a "clean debris surface" as defined in note 3 when separating treated debris from residue; rather, the surface must be free of caked soil, waste, or other nondebris material. Treatment residuals are subject to the waste-specific treatment standards for the waste contaminating the debris."

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 23, Issue No. 11, eff November 26, 1999.

268.46. Alternative treatment standards based on HTMR.

For the treatment standards previously found in this section, refer to 268.40.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993; amended by State Register Volume 20, Issue No. 5, eff May 24, 1996.

268.48. Universal Treatment Standards (added 5/96).

(a) Table UTS identifies the hazardous constituents, along with the nonwastewater and wastewater treatment standard levels, that are used to regulate most prohibited hazardous wastes with numerical limits. For determining compliance with treatment standards for underlying hazardous constituents as defined in 268.2(i), these treatment standards may not be exceeded. Compliance with these treatment standards is measured by an analysis of grab samples, unless otherwise noted in the following Table UTS.

268.48 - UNIVERSAL TREATMENT STANDARDS NOTE: NA means not applicable (8/00, 2/07)			
REGULATED CONSTITUENT Common Name	CAS ¹ Number	Wastewater Standard Concentration ² in mg/l	Nonwastewater Standard Concentration ³ in mg/kg unless noted as "mg/l TCLP"
Organic Constituents			
Acenaphthylene	208-96-8	0.059	3.4
Acenaphthene	83-32-9	0.059	3.4
Acetone	67-64-1	0.28	160
Acetonitrile	75-05-8	5.6	38
Acetophenone	96-86-2	0.010	9.7
2-Acetylaminofluorene	53-96-3	0.059	140
Acrolein	107-02-8	0.29	NA
Acrylamide	79-06-1	19	23
Acrylonitrile	107-13-1	0.24	84
Aldrin	309-00-2	0.021	0.066
4-Aminobiphenyl	92-67-1	0.13	NA
Aniline	62-53-3	0.81	14
o-Anisidine (2-methoxyaniline)	90-04-0	0.010	0.66
Anthracene	120-12-7	0.059	3.4
Aramite	140-57-8	0.36	NA
alpha-BHC	319-84-6	0.00014	0.066
beta-BHC	319-85-7	0.00014	0.066
delta-BHC	319-86-8	0.023	0.066
gamma-BHC	58-89-9	0.0017	0.066
Benzene	71-43-2	0.14	10
Benz(a)anthracene	56-55-3	0.059	3.4
Benzal chloride	98-87-3	0.055	6.0
Benzo(b)fluoranthene (difficult to distinguish from benzo(k)fluoranthene)	205-99-2	0.11	6.8
Benzo(k)fluoranthene (difficult to distinguish from benzo(b)fluoranthene)	207-08-9	0.11	6.8
Benzo(g,h,i)perylene	191-24-2	0.0055	1.8
Benzo(a)pyrene	50-32-8	0.061	3.4
Bromodichloromethane	75-27-4	0.35	15
Bromomethane/Methyl bromide	74-83-9	0.11	15
4-Bromophenyl phenyl ether	101-55-3	0.055	15
n-Butyl alcohol	71-36-3	5.6	2.6
Butyl benzyl phthalate	85-68-7	0.017	28
2-sec-Butyl-4,6-dinitrophenol/Dinoseb	88-85-7	0.066	2.5
Carbon disulfide	75-15-0	3.8	4.8 mg/l TCLP
Carbon tetrachloride	56-23-5	0.057	6.0
Chlordane (alpha and gamma isomers)	57-74-9	0.0033	0.26

268.48 - UNIVERSAL TREATMENT STANDARDS NOTE: NA means not applicable (8/00, 2/07)

REGULATED CONSTITUENT Common Name	CAS ¹ Number	Wastewater Standard	Nonwastewater Standard
p-Chloroaniline	106-47-8	0.46	16
Chlorobenzene	108-90-7	0.057	6.0
Chlorobenzilate	510-15-6	0.10	NA
2-Chloro-1,3-butadiene	126-99-8	0.057	0.28
Chlorodibromomethane	124-48-1	0.057	15
Chloroethane	75-00-3	0.27	6.0
bis(2-Chloroethoxy)methane	111-91-1	0.036	7.2
bis(2-Chloroethyl)ether	111-44-4	0.033	6.0
Chloroform	67-66-3	0.046	6.0
bis(2-Chloroisopropyl)ether	39638-32-9	0.055	7.2
p-Chloro-m-cresol	59-50-7	0.018	14
2-Chloroethyl vinyl ether	110-75-8	0.062	NA
Chloromethane/Methyl chloride	74-87-3	0.19	30
2-Chloronaphthalene	91-58-7	0.055	5.6
2-Chlorophenol	95-57-8	0.044	5.7
3-Chloropropylene	107-05-1	0.036	30
Chrysene	218-01-9	0.059	3.4
p-Cresidine	120-71-8	0.010	0.66
o-Cresol	95-48-7	0.11	5.6
m-Cresol (difficult to distinguish from p-cresol)	108-39-4	0.77	5.6
p-Cresol (difficult to distinguish from m-cresol)	106-44-5	0.77	5.6
Cyclohexanone	108-94-1	0.36	0.75 mg/l TCLP
o,p'-DDD	53-19-0	0.023	0.087
p,p'-DDD	72-54-8	0.023	0.087
o,p'-DDE	3424-82-6	0.031	0.087
p,p'-DDE	72-55-9	0.031	0.087
o,p'-DDT	789-02-6	0.0039	0.087
p,p'-DDT	50-29-3	0.0039	0.087
Dibenz(a,h)anthracene	53-70-3	0.055	8.2
Dibenz(a,e)pyrene	192-65-4	0.061	NA
1,2-Dibromo-3-chloropropane	96-12-8	0.11	15
1,2-Dibromoethane/Ethylene dibromide	106-93-4	0.028	15
Dibromomethane	74-95-3	0.11	15
m-Dichlorobenzene	541-73-1	0.036	6.0
o-Dichlorobenzene	95-50-1	0.088	6.0
p-Dichlorobenzene	106-46-7	0.090	6.0
Dichlorodifluoromethane	75-71-8	0.23	7.2
1,1-Dichloroethane	75-34-3	0.059	6.0
1,2-Dichloroethane	107-06-2	0.21	6.0
1,1-Dichloroethylene	75-35-4	0.025	6.0
trans-1,2-Dichloroethylene	156-60-5	0.054	30
2,4-Dichlorophenol	120-83-2	0.044	14
2,6-Dichlorophenol	87-65-0	0.044	14
2,4-Dichlorophenoxyacetic acid/2,4-D	94-75-7	0.72	10
1,2-Dichloropropane	78-87-5	0.85	18
cis-1,3-Dichloropropylene	10061-01-5	0.036	18
trans-1,3-Dichloropropylene	10061-02-6	0.036	18
Dieldrin	60-57-1	0.017	0.13
Diethyl phthalate	84-66-2	0.20	28
p-Dimethylaminoazobenzene	60-11-7	0.13	NA
2,4-Dimethylaniline (2,4-xylidine)	95-68-1	0.010	0.66

268.48 - UNIVERSAL TREATMENT STANDARDS NOTE: NA means not applicable (8/00, 2/07)

REGULATED CONSTITUENT Common Name	CAS ¹ Number	Wastewater Standard	Nonwastewater Standard
2,4-Dimethyl phenol	105-67-9	0.036	14
Dimethyl phthalate	131-11-3	0.047	28
Dimetilan	644-64-4	0.056	1.4
Di-n-butyl phthalate	84-74-2	0.057	28
1,4-Dinitrobenzene	100-25-4	0.32	2.3
4,6-Dinitro-o-cresol	534-52-1	0.28	160
2,4-Dinitrophenol	51-28-5	0.12	160
2,4-Dinitrotoluene	121-14-2	0.32	140
2,6-Dinitrotoluene	606-20-2	0.55	28
Di-n-octyl phthalate	117-84-0	0.017	28
Di-n-propylnitrosamine	621-64-7	0.40	14
1,4-Dioxane	123-91-1	12.0	170
Diphenylamine (difficult to distinguish from di-phenylnitrosamine)	122-39-4	0.92	13
Diphenylnitrosamine (difficult to distinguish from diphenylamine)	86-30-6	0.92	13
1,2-Diphenylhydrazine	122-66-7	0.087	NA
Disulfoton	298-04-4	0.017	6.2
Endosulfan I	959-98-8	0.023	0.066
Endosulfan II	33213-65-9	0.029	0.13
Endosulfan sulfate	1031-07-8	0.029	0.13
Endrin	72-20-8	0.0028	0.13
Endrin aldehyde	7421-93-4	0.025	0.13
Ethyl acetate	141-78-6	0.34	33
Ethyl benzene	100-41-4	0.057	10
Ethyl cyanide/Propanenitrile	107-12-0	0.24	360
Ethyl ether	60-29-7	0.12	160
bis(2-Ethylhexyl) phthalate	117-81-7	0.28	28
Ethyl methacrylate	97-63-2	0.14	160
Ethylene oxide	75-21-8	0.12	NA
Famphur	52-85-7	0.017	15
Fluoranthene	206-44-0	0.068	3.4
Fluorene	86-73-7	0.059	3.4
Heptachlor	76-44-8	0.0012	0.066
Heptachlor epoxide	1024-57-3	0.016	0.066
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin(1,2,3,4,6,7,8-HpCDD) (6/02)	35822-46-9	0.000035	0.0025
1,2,3,4,6,7,8-Heptachlorodibenzofuran (1,2,3,4,6,7,8-HpCDF) (6/02)	67562-39-4	0.000035	0.0025
1,2,3,4,7,8,9-Heptachlorodibenzofuran (1,2,3,4,7,8,9-HpCDF) (6/02)	55673-89-7	0.000035	0.0025
Hexachlorobenzene	118-74-1	0.055	10
Hexachlorobutadiene	87-68-3	0.055	5.6
Hexachlorocyclopentadiene	77-47-4	0.057	2.4
HxCDDs (All Hexachlorodibenzo-p-dioxins)	NA	0.000063	0.001
HxCDFs (All Hexachlorodibenzofurans)	NA	0.000063	0.001
Hexachloroethane	67-72-1	0.055	30
Hexachloropropylene	1888-71-7	0.035	30
Indeno (1,2,3-c,d) pyrene	193-39-5	0.0055	3.4
Iodomethane	74-88-4	0.19	65
Isobutyl alcohol	78-83-1	5.6	170
Isodrin	465-73-6	0.021	0.066

268.48 - UNIVERSAL TREATMENT STANDARDS NOTE: NA means not applicable (8/00, 2/07)

REGULATED CONSTITUENT Common Name	CAS ¹ Number	Wastewater Standard	Nonwastewater Standard
Isosafrole	120-58-1	0.081	2.6
Kepone	143-50-0	0.0011	0.13
Methacrylonitrile	126-98-7	0.24	84
Methanol	67-56-1	5.6	0.75 mg/l TCLP
Methapyrilene	91-80-5	0.081	1.5
Methoxychlor	72-43-5	0.25	0.18
3-Methylcholanthrene	56-49-5	0.0055	15
4,4-Methylene bis(2-chloroaniline)	101-14-4	0.50	30
Methylene chloride	75-09-2	0.089	30
Methyl ethyl ketone	78-93-3	0.28	36
Methyl isobutyl ketone	108-10-1	0.14	33
Methyl methacrylate	80-62-6	0.14	160
Methyl methansulfonate	66-27-3	0.018	NA
Methyl parathion	298-00-0	0.014	4.6
Naphthalene	91-20-3	0.059	5.6
2-Naphthylamine	91-59-8	0.52	NA
o-Nitroaniline	88-74-4	0.27	14
p-Nitroaniline	100-01-6	0.028	28
Nitrobenzene	98-95-3	0.068	14
5-Nitro-o-toluidine	99-55-8	0.32	28
o-Nitrophenol	88-75-5	0.028	13
p-Nitrophenol	100-02-7	0.12	29
N-Nitrosodiethylamine	55-18-5	0.40	28
N-Nitrosodimethylamine	62-75-9	0.40	2.3
N-Nitroso-di-n-butylamine	924-16-3	0.40	17
N-Nitrosomethylethylamine	10595-95-6	0.40	2.3
N-Nitrosomorpholine	59-89-2	0.40	2.3
N-Nitrosopiperidine	100-75-4	0.013	35
N-Nitrosopyrrolidine	930-55-2	0.013	35
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD) (6/02)	3268-87-9	0.000063	0.005
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF) (6/02)	39001-02-0	0.000063	0.005
Parathion	56-38-2	0.014	4.6
Total PCBs (sum of all PCB isomers, or all Aroclors) ⁸	1336-36-3	0.10	10
Pentachlorobenzene	608-93-5	0.055	10
PeCDDs (All Pentachlorodibenzo-p-dioxins)	NA	0.000063	0.001
PeCDFs (All Pentachlorodibenzofurans)	NA	0.000035	0.001
Pentachloroethane	76-01-7	0.055	6.0
Pentachloronitrobenzene	82-68-8	0.055	4.8
Pentachlorophenol	87-86-5	0.089	7.4
Phenacetin	62-44-2	0.081	16
Phenanthrene	85-01-8	0.059	5.6
Phenol	108-95-2	0.039	6.2
1,3-Phenylenediamine	108-45-2	0.010	0.66
o-Phenylenediamine	95-54-5	0.056	5.6
Phorate	298-02-2	0.021	4.6
Phthalic acid	100-21-0	0.055	28
Phthalic anhydride	85-44-9	0.055	28
Pronamide	23950-58-5	0.093	1.5
Pyrene	129-00-0	0.067	8.2

268.48 - UNIVERSAL TREATMENT STANDARDS NOTE: NA means not applicable (8/00, 2/07)

REGULATED CONSTITUENT Common Name	CAS ¹ Number	Wastewater Standard	Nonwastewater Standard
Pyridine	110-86-1	0.014	16
Safrole	94-59-7	0.081	22
Silvex/2,4,5-TP	93-72-1	0.72	7.9
1,2,4,5-Tetrachlorobenzene	95-94-3	0.055	14
TCDDs (All Tetrachlorodibenzo-p-dioxins)	NA	0.000063	0.001
TCDFs (All Tetrachlorodibenzofurans)	NA	0.000063	0.001
1,1,1,2-Tetrachloroethane	630-20-6	0.057	6.0
1,1,2,2-Tetrachloroethane	79-34-5	0.057	6.0
Tetrachloroethylene	127-18-4	0.056	6.0
2,3,4,6-Tetrachlorophenol	58-90-2	0.030	7.4
Toluene	108-88-3	0.080	10
Toxaphene	8001-35-2	0.0095	2.6
Tribromomethane/Bromoform	75-25-2	0.63	15
1,2,4-Trichlorobenzene	120-82-1	0.055	19
1,1,1-Trichloroethane	71-55-6	0.054	6.0
1,1,2-Trichloroethane	79-00-5	0.054	6.0
Trichloroethylene	79-01-6	0.054	6.0
Trichloromonofluoromethane	75-69-4	0.020	30
2,4,5-Trichlorophenol	95-95-4	0.18	7.4
2,4,6-Trichlorophenol	88-06-2	0.035	7.4
2,4,5-Trichlorophenoxyacetic acid/2,4,5-T	93-76-5	0.72	7.9
1,2,3-Trichloropropane	96-18-4	0.85	30
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	0.057	30
tris-(2,3-Dibromopropyl) phosphate	126-72-7	0.11	0.10
Vinyl chloride	75-01-4	0.27	6.0
Xylenes-mixed isomers (sum of o-, m-, and p-xylene concentrations)	1330-20-7	0.32	30
Inorganic Constituents			
Antimony	7440-36-0	1.9	1.15 mg/l TCLP
Arsenic	7440-38-2	1.4	5.0 mg/l TCLP
Barium	7440-39-3	1.2	21 mg/l TCLP
Beryllium	7440-41-7	0.82	1.22 mg/l TCLP
Cadmium	7440-43-9	0.69	0.11 mg/l TCLP
Chromium (Total)	7440-47-3	2.77	0.60 mg/l TCLP
Cyanides (Total) ⁴	57-12-5	1.2	590
Cyanides (Amenable) ⁴	57-12-5	0.86	30
Fluoride ⁵	16984-48-8	35	NA
Lead	7439-92-1	0.69	0.75 mg/l TCLP
Mercury - Nonwastewater from Retort	7439-97-6	NA	0.20 mg/l TCLP
Mercury - All Others	7439-97-6	0.15	0.025 mg/l TCLP
Nickel	7440-02-0	3.98	11. mg/l TCLP
Selenium ⁷	7782-49-2	0.82	5.7 mg/l TCLP
Silver	7440-22-4	0.43	0.14 mg/l TCLP
Sulfide ⁵	18496-25-8	14	NA
Thallium	7440-28-0	1.4	0.20 mg/l TCLP
Vanadium ⁵	7440-62-2	4.3	1.6 mg/l TCLP
Zinc ⁵	7440-66-6	2.61	4.3 mg/l TCLP

FOOTNOTES TO TABLE UTS - * Note: N/A means "not applicable."

1. CAS means Chemical Abstract Services. When the waste code and/or regulated constituents are described as a combination of a chemical with its salts and/or esters, the CAS number is given for the parent compound only.

2. Concentration standards for wastewaters are expressed in mg/l and are based on analysis of composite samples.

3. Except for Metals (EP or TCLP) and Cyanides (Total and Amenable) the nonwastewater treatment standards expressed as a concentration were established, in part, based upon incineration in units operated in accordance

with the technical requirements of part 264, subpart O or part 265, subpart O, or based upon combustion in fuel substitution units operating in accordance with applicable technical requirements. A facility may comply with these treatment standards according to provisions in 268.40(d). All concentration standards for nonwastewaters are based on analysis of grab samples.

4. Both Cyanides (Total) and Cyanides (Amenable) for nonwastewaters are to be analyzed using Method 9010 or 9012, found in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, EPA Publication SW-846, as incorporated by reference in 260.11, with a sample size of 10 grams and a distillation time of one hour and 15 minutes.

5. These constituents are not “underlying hazardous constituents” in characteristic wastes, according to the definition at 268.2(i).

6. [Reserved 8/00]

7. This constituent is not an underlying hazardous constituent as defined at 268.2(i) of this part because its UTS level is greater than its TC level, thus a treated selenium waste would always be characteristically hazardous, unless it is treated to below its characteristic level.

8. This standard is temporarily deferred for soil exhibiting a hazardous characteristic due to D004-D011 only.

HISTORY: Added by the State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002; State Register Volume 31, Issue No. 2, eff February 23, 2007; State Register Volume 36, Issue No. 9, eff September 28, 2012; State Register Volume 39, Issue No. 6, Doc. No. 4541, eff June 26, 2015.

268.49. Alternative LDR treatment standards for contaminated soil.

(a) Applicability You must comply with LDRs prior to placing soil that exhibits a characteristic of hazardous waste, or exhibited a characteristic of hazardous waste at the time it was generated, into a land disposal unit. The following chart describes whether you must comply with LDRs prior to placing soil contaminated by listed hazardous waste into a land disposal unit:

If LDRs...	And If LDRs...	And If...	Then You...
Applied to the listed waste when it contaminated the soil *	apply to the listed waste now		must comply with LDRs
Didn't apply to the listed waste when it contaminated the soil *	apply to the listed waste now	the soil is determined to contain the listed waste when the soil is first generated	must comply with LDRs
didn't apply to the listed waste when it contaminated the soil *	apply to the listed waste now	the soil is determined not to contain the listed waste when the soil is first generated	needn't comply with LDRs
didn't apply to the listed waste when it contaminated the soil *	don't apply to the listed waste now		needn't comply with LDRs

* For dates of LDR applicability, see Part 268 Appendix VII. To determine the date any given listed hazardous waste contaminated any given volume of soil, use the last date any given listed hazardous waste placed into any given land disposal unit or, in the case of an accidental spill, the date of the spill.

(b) Prior to land disposal, contaminated soil identified by paragraph (a) of this section as needing to comply with LDRs must be treated according to the applicable treatment standards specified in paragraph (c) of this section or according to the Universal Treatment Standards specified in 268.48 applicable to the contaminating listed hazardous waste and/or the applicable characteristic of hazardous waste if the soil is characteristic. The treatment standards specified in paragraph (c) of this section and the Universal Treatment Standards may be modified through a treatment variance approved in accordance with 268.44.

(c) Treatment standards for contaminated soils. Prior to land disposal, contaminated soil identified by paragraph (a) of this section as needing to comply with LDRs must be treated according to all the standards specified in this paragraph or according to the Universal Treatment Standards specified in 268.48.

(1) All soils. Prior to land disposal, all constituents subject to treatment must be treated as follows:

(A) For non-metals except carbon disulfide, cyclohexanone, and methanol, treatment must achieve 90 percent reduction in total constituent concentrations, except as provided by paragraph (c)(1)(C) of this section.

(B) For metals and carbon disulfide, cyclohexanone, and methanol treatment must achieve 90 percent reduction in constituent concentrations as measured in leachate from the treated 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 (c)(1)(C) of this section.

(C) When treatment of any constituent subject to treatment 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.

(2) Soils that exhibit the characteristic of ignitability, corrosivity or reactivity. In addition to the treatment required by paragraph (c)(1) of this section, prior to land disposal, soils that exhibit the characteristic of ignitability, corrosivity, or reactivity must be treated to eliminate these characteristics.

(3) Soils that contain nonanalyzable constituents. In addition to the treatment requirements of paragraphs (c)(1) and (2) of this section, prior to land disposal, the following treatment is required for soils that contain nonanalyzable constituents:

(A) For soil that contains only analyzable and nonanalyzable organic constituents, treatment of the analyzable organic constituents to the levels specified in paragraphs (c)(1) and (2) of this section; or,

(B) For soil that contains only nonanalyzable constituents, treatment by the methods specified in 268.42 for the waste contained in the soil.

(d) Constituents subject to treatment. When applying the soil treatment standards in paragraph (c) of this section, constituents subject to treatment are any constituents listed in 268.48 Table UTS - Universal Treatment Standards that are reasonably expected to be present in any given volume of contaminated soil, except fluoride, selenium, sulfides, vanadium, zinc, and that are present at concentrations greater than ten times the universal treatment standard. PCBs are not constituent subject to treatment in any given volume of soil which exhibits the toxicity characteristic solely because of the presence of metals.

(e) Management of treatment residual. Treatment residuals from treating contaminated soil identified by paragraph (a) of this section as needing to comply with LDRs must be managed as follows:

(1) Soil residuals are subject to the treatment standards of this section:

(2) Non-soil residuals are subject to:

(A) For soils contaminated by listed hazardous waste, the RCRA Subtitle C standards applicable to the listed hazardous waste; and

(B) For soils that exhibit a characteristic of hazardous waste, if the non-soil residual also exhibits a characteristic of hazardous waste, the treatment standards applicable to the characteristic hazardous waste.

HISTORY: Added by State Register Volume 23, Issue No. 11, eff November 26, 1999. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

SUBPART E ***Prohibitions on Storage***

268.50. Prohibitions on storage of restricted wastes.

(a) Except as provided for in this section, the storage of hazardous wastes restricted from land disposal under subpart C of this part is prohibited, unless the following conditions are met:

(1) A generator stores such wastes in tanks, containers, or containment buildings onsite solely for the purpose of the accumulation of such quantities of hazardous waste as necessary to facilitate proper recovery, treatment, or disposal and the generator complies with the requirements in R.61-79.262.16 and 262.17 and R.61-79.264 and 265.

(2) An owner/operator of a hazardous waste treatment, storage, or disposal facility stores such wastes in tanks, containers, or containment buildings solely for the purpose of the accumulation of

such quantities of hazardous waste as necessary to facilitate proper recovery, treatment, or disposal and: (amended 11/90, 12/92)

(i) Each container is clearly marked to identify its contents and with:

(A) The words "Hazardous Waste";

(B) The applicable EPA hazardous waste number(s) (EPA hazardous waste codes) in R.61-79.261 subparts C and D; or use a nationally recognized electronic system, such as bar coding, to identify the EPA hazardous waste number(s);

(C) An indication of the hazards of the contents (examples include, but are not limited to, the applicable hazardous waste characteristics(s) (i.e., ignitable, corrosive, reactive, toxic); hazard communication consistent with the Department of Transportation requirements at 49 CFR part 172 subpart E (labeling) or subpart F (placarding); a hazard statement or pictogram consistent with the Occupational Safety and Health Administration Hazard Communication Standard at 29 CFR 1910.1200; or a chemical hazard label consistent with the National Fire Protection Association code 704); and

(D) The date each period of accumulation begins.

(ii) Each tank is clearly marked with a description of its contents, the quantity of each hazardous waste received, and the date each period of accumulation begins, or such information for each tank is recorded and maintained in the operating record at that facility. Regardless of whether the tank itself is marked, an owner/operator must comply with the operating record requirements specified in 264.73 or 265.73.

(3) A transporter stores manifested shipments of such wastes at a transfer facility for 10 days or less.

(4) A healthcare facility accumulates such wastes in containers on-site solely for the purpose of the accumulation of such quantities of hazardous waste pharmaceuticals as necessary to facilitate proper recovery, treatment, or disposal and the healthcare facility complies with the applicable requirements in Sections 266.502 and 266.503 of this chapter.

(5) A reverse distributor accumulates such wastes in containers on-site solely for the purpose of the accumulation of such quantities of hazardous waste pharmaceuticals as necessary to facilitate proper recovery, treatment, or disposal and the reverse distributor complies with Section 266.510 of this chapter.

(b) An owner/operator of a treatment, storage or disposal facility may store such wastes for up to one year unless the Department can demonstrate that such storage was not solely for the purpose of accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal.

(c) An owner/operator of a treatment, storage or disposal facility may store such wastes beyond one year; however, the owner/operator bears the burden of proving that such storage was solely for the purpose of accumulation of such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal.

(d) If a generator's waste is exempt from a prohibition on the type of land disposal utilized for the waste (for example, because of an approved case-by-case extension under 268.5, an approved 268.6 petition, or a national capacity variance under subpart C), the prohibition in paragraph (a) does not apply during the period of such exemption.

(e) The prohibition in paragraph (a) does not apply to hazardous wastes that meet the treatment standards specified under Sections 268.41, 268.42 and 268.43 or the treatment standards specified under the variance in section 268.44 or, where treatment standards have not been specified, is in compliance with the applicable prohibitions specified in 268.32 or RCRA section 3004.

(f) Liquid hazardous wastes containing polychlorinated biphenyls (PCB's) at concentrations greater than or equal to 50 ppm must be stored at a facility that meets the requirements of 40 CFR 761.65(b) and must be removed from storage and treated or disposed as required by this part within one year of the date when such wastes are first placed into storage. The provisions of paragraph (c) of this section do not apply to such PCB wastes prohibited under 268.32 of this part. (amended 11/90)

(g) The prohibition and requirements in this section do not apply to hazardous remediation wastes stored in a staging pile approved pursuant to 264.554 of this chapter.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 24, Issue No. 8, eff August 25, 2000; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 44-11 Doc. No. 4976, eff November 27, 2020; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

Appendix III. List of Halogenated Organic Compounds Regulated Under 268.32

In determining the concentration of HOCs in a hazardous waste for purposes of the 268.32 land disposal prohibition, EPA has defined the HOCs that must be included in a calculation as any compounds having a carbon-halogen bond which are listed in this Appendix (see 268.2). 268 Appendix III consists of the following compounds:

- I. Volatiles
 1. Bromodichloromethane
 2. Bromomethane
 3. Carbon Tetrachloride
 4. Chlorobenzene
 5. 2-Chloro-1,-butadiene
 6. Chlorodibromomethane
 7. Chloroethane
 8. 2-Chloroethyl vinyl ether
 9. Chloroform
 10. Chloromethane
 11. 3-Chloropropene
 12. 1,2-Dibromo-3-chloropropane
 13. 1,2-Dibromomethane
 14. Dibromomethane
 15. Trans-1,4-Dichloro-2Cbutene
 16. Dichlorodifluoromethane
 17. 1,1-Dichloroethane
 18. 1,2-Dichloroethane
 19. 1,1-Dichloroethylene
 20. Trans-1,2-Dichloroethene
 21. 1,2-Dichloropropane
 22. Trans-1,3-Dichloropropene
 23. cis-1,3-Dichloropropene
 24. Iodomethane
 25. Methylene chloride
 26. 1,1,1,2-Tetrachloroethane
 27. 1,1,2,2-Tetrachloroethane
 28. Tetrachloroethene
 29. Tribromomethane
 30. 1,1,1-Trichloroethane
 31. 1,1,2-Trichloroethane
 32. Trichloroethene
 33. Trichloromonofluoromethane

34. 1,2,3-Trichloropropane
35. Vinyl Chloride
- II. Semivolatiles
 1. Bis(2-chloroethoxy)ethane
 2. Bis(2-chloroethyl)ether
 3. Bis(2-chloroisopropyl)ether
 4. p-Chloroaniline
 5. Chlorobenzilate
 6. p-Chloro-m-cresol
 7. 2-Chloronaphthalene
 8. 2-Chlorophenol
 9. 3-Chloropropionitrile
 10. m-Dichlorobenzene
 11. o-Dichlorobenzene
 12. p-Dichlorobenzene
 13. 3,3'-Dichlorobenzidine
 14. 2,4-Dichlorophenol
 15. 2,6-Dichlorophenol
 16. Hexachlorobenzene
 17. Hexachlorobutadiene
 18. Hexachlorocyclopentadiene
 19. Hexachloroethane
 20. Hexachloroprophene
 21. Hexachlorpropene
 22. 4,4'-Methylenebis(2-chloroaniline)
 23. Pentachlorobenzene
 24. Pentachloroethane
 25. Pentachloronitrobenzene
 26. Pentachlorophenol
 27. Pronamide
 28. 1,2,4,5-Tetrachlorobenzene
 29. 2,3,4,6-Tetrachlorophenol
 30. 1,2,4-Trichlorobenzene
 31. 2,4,5-Trichlorophenol
 32. 2,4,6-Trichlorophenol
 33. Tris(2,3-dibromopropyl)phosphate
- III. Organochlorine Pesticides
 1. Aldrin
 2. alpha-BHC
 3. beta-BHC
 4. delta-BHC
 5. gamma-BHC
 6. Chlorodane
 7. DDD

8. DDE
9. DDT
10. Dieldrin
11. Endosulfan I
12. Endosulfan II
13. Endrin
14. Endrin aldehyde
15. Heptachlor
16. Heptachlor epoxide
17. Isodrin
18. Kepone
19. Methoxychlor
20. Toxaphene
- IV. Phenoxyacetic Acid Herbicides
 1. 2,4-Dichlorophenoxyacetic acid
 2. Silvex
 3. 2,4,5-T
- V. PCBs
 1. Aroclor 1016
 2. Aroclor 1221
 3. Aroclor 1232
 4. Aroclor 1242
 5. Aroclor 1248
 6. Aroclor 1254
 7. Aroclor 1260
 8. PCBs not otherwise specified
- VI. Dioxins and Furans
 1. Hexachlorodibenzo-p-dioxins
 2. Hexachlorodibenzofuran
 3. Pentachlorodibenzo-p-dioxins
 4. Pentachlorodibenzofuran
 5. Tetrachlorodibenzo-p-dioxins
 6. Tetrachlorodibenzofuran
 7. 2,3,7,8-Tetrachlorodibenzo-p-dioxin

HISTORY: Added by State Register Volume 26, Issue No. 6, Part 1, eff June 28, 2002.

Appendix IV. Wastes Excluded From Lab Packs Under the Alternative Treatment Standards of 268.42(c): (major revision 5/96)

Hazardous waste with the following EPA Hazardous Waste Codes may not be placed in lab packs under the alternative lab pack treatment standards of 268.42(c): D009, F019, K003, K004, K005, K006, K062, K071, K100, K106, P010, P011, P012, P076, P078, U134, U151.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; amended by State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996.

Appendix VI. Recommended Technologies to Achieve Deactivation of Characteristics in Section 268.42

The treatment standard for many characteristic wastes is stated in the 268.40 Table of Treatment Standards as "Deactivation and meet UTS." EPA has determined that many technologies, when used

alone or in combination, can achieve the deactivation portion of the treatment standard. Characteristic wastes that are not managed in a facility regulated by the Clean Water Act (CWA) or in a CWA-equivalent facility, and that also contain underlying hazardous constituents (see 268.2(i)) must be treated not only by a “deactivating” technology to remove the characteristic, but also to achieve the universal treatment standards (UTS) for underlying hazardous constituents. The following appendix presents a partial list of technologies, utilizing the five letter technology codes established in 268.42 Table 1, that may be useful in meeting the treatment standard. Use of these specific technologies is not mandatory and does not preclude direct reuse, recovery, and/or the use of other pretreatment technologies, provided deactivation is achieved and underlying hazardous constituents are treated to achieve the UTS.

Waste code/subcategory	Nonwaste-waters	Waste-waters
D001 Ignitable Liquids based on 261.21(a)(1)—Low TOC Nonwastewater Subcategory (containing 1% to <10% TOC)	RORGS INCIN WETOX CHOXD BIODG	n.a.
D001 Ignitable Liquids based on 261.21(a)(1)—Ignitable Wastewater Subcategory (containing <1% TOC)	n.a.	RORGS INCIN WETOX CHOXD BIODG
D001 Compressed Gases based on 261.21(A)(3)	RCGAS INCIN FSUBS ADGAS fb. INCIN ADGAS fb. (CHOXD: or CHRED)	n.a.
D001 Ignitable Reactives based on 261.21(a)(2)	WTRRX CHOXD CHRED STABL INCIN	n.a.
D001 Ignitable Oxidizers based on 261.21(a)(4)	CHRED INCIN	CHRED INCIN
D002 Acid Subcategory based on 261.22(a)(1) with pH less than or equal to 2	RCORR NEUTR INCIN	NEUTR INCIN
D002 Alkaline Subcategory based on 261.22(a)(1) with pH greater than or equal to 12.5	NEUTR INCIN	NEUTR INCIN
D002 Other Corrosives based on 261.22(a)(2)	CHOXD CHRED INCIN STABL	CHOXD CHRED INCIN
D003 Water Reactives based on 261.23(a)(2), (3), and (4)	INCIN WTRRX CHOXD CHRED	n.a.
D003 Reactive Sulfides based on 261.23(a)(5)	CHOXD CHRED INCIN STABL	CHOXD CHRED BIODG INCIN
D003 Explosives based on 261.23(a)(6), (7), and (8)	INCIN CHOXD CHRED	INCIN CHOXD CHRED BIODG CARBN

Waste code/subcategory	Nonwaste-waters	Waste-waters
D003 Other Reactives based on 261.23(a)(1)	INCIN CHOXD CHRED	INCIN CHOXD CHRED BIODG CARBN
K044 Wastewater treatment sludges from the manufacturing and processing of explosives	CHOXD CHRED INCIN	CHOXD CHRED BIODG CARBN INCIN
K045 Spent carbon from the treatment of wastewaters containing explosives	CHOXD CHRED INCIN	CHOXD CHRED BIODG CARBN INCIN
K047 Pink/red water from TNT operations	CHOXD CHRED INCIN	CHOXD CHRED BIODG CARBN INCIN

FOOTNOTE: Note: "n.a." stands for "not applicable"; "fb." stands for "followed by".

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

Appendix VII. [Effective dates].

Table 1.—Effective Dates of Surface Disposed Wastes (Non-Soil and Debris) Regulated in the LDRs^a—Comprehensive List

D001 ^c	All (except High TOC Ignitable Liquids)	Aug. 9, 1993.
D001	High TOC Ignitable Liquids	Aug. 8, 1990.
D002 ^c	All	Aug. 9, 1993.
D003 ^e	All	July 8, 1996.
D004	Nonwastewater	May 8, 1992.
D004	Wastewater	Aug. 8, 1992.
D005	All	Aug. 8, 1990.
D006	All	Aug. 8, 1990.
D007	All	Aug. 8, 1990.
D008	Lead materials before secondary smelting	May 8, 1992.
D008	All others	Aug. 8, 1990.
D009	Nonwastewater	May 8, 1992.
D009	All others	Aug. 8, 1990.
D010	All	Aug. 8, 1990.
D011	All	Aug. 8, 1990.
D012 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D013 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D014 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D015 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D016 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D017 (that exhibit the toxicity characteristic based on the TCLP) ^d	All	Dec. 14, 1994.
D018	Mixed with radioactive wastes	Sept. 19, 1996.
D018	All others	Dec. 19, 1994.

D019	Mixed with radioactive wastes	Sept. 19, 1996.
D019	All others	Dec. 19, 1994.
D020	Mixed with radioactive wastes	Sept. 19, 1996.
D020	All others	Dec. 19, 1994.
D021	Mixed with radioactive wastes	Sept. 19, 1996.
D021	All others	Dec. 19, 1994.
D022	Mixed with radioactive wastes	Sept. 19, 1996.
D022	All others	Dec. 19, 1994.
D023	Mixed with radioactive wastes	Sept. 19, 1996.
D023	All others	Dec. 19, 1994.
D024	Mixed with radioactive wastes	Sept. 19, 1996.
D024	All others	Dec. 19, 1994.
D025	Mixed with radioactive wastes	Sept. 19, 1996.
D025	All others	Dec. 19, 1994.
D026	Mixed with radioactive wastes	Sept. 19, 1996.
D026	All others	Dec. 19, 1994.
D027	Mixed with radioactive wastes	Sept. 19, 1996.
D027	All others	Dec. 19, 1994.
D028	Mixed with radioactive wastes	Sept. 19, 1996.
D028	All others	Dec. 19, 1994.
D029	Mixed with radioactive wastes	Sept. 19, 1996.
D029	All others	Dec. 19, 1994.
D030	Mixed with radioactive wastes	Sept. 19, 1996.
D030	All others	Dec. 19, 1994.
D031	Mixed with radioactive wastes	Sept. 19, 1996.
D031	All others	Dec. 19, 1994.
D032	Mixed with radioactive wastes	Sept. 19, 1996.
D032	All others	Dec. 19, 1994.
D033	Mixed with radioactive wastes	Sept. 19, 1996.
D033	All others	Dec. 19, 1994.
D034	Mixed with radioactive wastes	Sept. 19, 1996.
D034	All others	Dec. 19, 1994.
D035	Mixed with radioactive wastes	Sept. 19, 1996.
D035	All others	Dec. 19, 1994.
D036	Mixed with radioactive wastes	Sept. 19, 1996.
D036	All others	Dec. 19, 1994.
D037	Mixed with radioactive wastes	Sept. 19, 1996.
D037	All others	Dec. 19, 1994.
D038	Mixed with radioactive wastes	Sept. 19, 1996.
D038	All others	Dec. 19, 1994.
D039	Mixed with radioactive wastes	Sept. 19, 1996.
D039	All others	Dec. 19, 1994.
D040	Mixed with radioactive wastes	Sept. 19, 1996.
D040	All others	Dec. 19, 1994.
D041	Mixed with radioactive wastes	Sept. 19, 1996.
D041	All others	Dec. 19, 1994.
D042	Mixed with radioactive wastes	Sept. 19, 1996.
D042	All others	Dec. 19, 1994.
D043	Mixed with radioactive wastes	Sept. 19, 1996.
D043	All others	Dec. 19, 1994.
F001	Small quantity generators, CERCLA response/RCRA corrective action, initial generator's solvent-water mixtures, solvent-containing sludges and solids.	Nov. 8, 1988.
F001	All others	Nov. 8, 1986.
F002 (1,1,2-trichloroethane)	Wastewater and Nonwastewater	Aug. 8, 1990.
F002	Small quantity generators, CERCLA response/RCRA corrective action, initial generator's solvent-water mixtures, solvent-containing sludges and solids.	Nov. 8, 1988.
F002	All others	Nov. 8, 1986.

F003	Small quantity generators, CERCLA response/RCRA corrective action, initial generator's solvent-water mixtures, solvent-containing sludges and solids.	Nov. 8, 1988.
F003	All others	Nov. 8, 1986.
F004	Small quantity generators, CERCLA response/RCRA corrective action, initial generator's solvent-water mixtures, solvent-containing sludges and solids.	Nov. 8, 1988.
F004	All others	Nov. 8, 1986.
F005 (benzene, 2-ethoxy ethanol, 2-nitropropane)	Wastewater and Nonwastewater	Aug. 8, 1990.
F005	Small quantity generators, CERCLA response/RCRA corrective action, initial generator's solvent-water mixtures, solvent-containing sludges and solids.	Nov. 8, 1988.
F005	All others	Nov. 8, 1986.
F006	Wastewater	Aug. 8, 1990.
F006	Nonwastewater	Aug. 8, 1988.
F006 (cyanides)	Nonwastewater	July 8, 1989.
F007	All	July 8, 1989.
F008	All	July 8, 1989.
F009	All	July 8, 1989.
F010	All	June 8, 1989.
F011 (cyanides)	Nonwastewater	Dec. 8, 1989.
F011	All others	July 8, 1989.
F012 (cyanides)	Nonwastewater	Dec. 8, 1989.
F012	All others	July 8, 1989.
F019	All	Aug. 8, 1990.
F020	All	Nov. 8, 1988.
F021	All	Nov. 8, 1988.
F025	All	Aug. 8, 1990.
F026	All	Nov. 8, 1988.
F027	All	Nov. 8, 1988.
F028	All	Nov. 8, 1988.
F032	Mixed with radioactive wastes	May 12, 1999
F032	All others	May 12, 1997
F033	Mixed with radioactive wastes	May 12, 1999
F033	All others	May 12, 1997
F034	Mixed with radioactive wastes	May 12, 1999
F034	All others	May 12, 1997
F037	Not generated from surface impoundment cleanouts or closures	June 30, 1993.
F037	Generated from surface impoundment cleanouts or closures	June 30, 1994.
F037	Mixed with radioactive wastes	June 30, 1994.
F038	Not generated from surface impoundment cleanouts or closures	June 30, 1993.
F038	Generated from surface impoundment cleanouts or closures	June 30, 1994.
F038	Mixed with radioactive wastes	June 30, 1994.
F039	Wastewater	Aug. 8, 1990.
F039	Nonwastewater	May 8, 1992.
K001 (organics) ^b	All	Aug. 8, 1988.
K001	All others	Aug. 8, 1988.
K002	All	Aug. 8, 1990.
K003	All	Aug. 8, 1990.
K004	Wastewater	Aug. 8, 1990.
K004	Nonwastewater	Aug. 8, 1988.
K005	Wastewater	Aug. 8, 1990.
K005	Nonwastewater	June 8, 1989.
K006	All	Aug. 8, 1990.
K007	Wastewater	Aug. 8, 1990.

K007	Nonwastewater	June 8, 1989.
K008	Wastewater	Aug. 8, 1990.
K008	Nonwastewater	Aug. 8, 1988.
K009	All	June 8, 1989.
K010	All	June 8, 1989.
K011	Wastewater	Aug. 8, 1990.
K011	Nonwastewater	June 8, 1989.
K013	Wastewater	Aug. 8, 1990.
K013	Nonwastewater	June 8, 1989.
K014	Wastewater	Aug. 8, 1990.
K014	Nonwastewater	June 8, 1989.
K015	Wastewater	Aug. 8, 1988.
K015	Nonwastewater	Aug. 8, 1990.
K016	All	Aug. 8, 1988.
K017	All	Aug. 8, 1990.
K018	All	Aug. 8, 1988.
K019	All	Aug. 8, 1988.
K020	All	Aug. 8, 1988.
K021	Wastewater	Aug. 8, 1990.
K021	Nonwastewater	Aug. 8, 1988.
K022	Wastewater	Aug. 8, 1990.
K022	Nonwastewater	Aug. 8, 1988.
K023	All	June 8, 1989.
K024	All	Aug. 8, 1988.
K025	Wastewater	Aug. 8, 1990.
K025	Nonwastewater	Aug. 8, 1988.
K026	All	Aug. 8, 1990.
K027	All	June 8, 1989.
K028 (metals)	Nonwastewater	Aug. 8, 1990.
K028	All others	June 8, 1989.
K029	Wastewater	Aug. 8, 1990.
K029	Nonwastewater	June 8, 1989.
K030	All	Aug. 8, 1988.
K031	Wastewater	Aug. 8, 1990.
K031	Nonwastewater	May 8, 1992.
K032	All	Aug. 8, 1990.
K033	All	Aug. 8, 1990.
K034	All	Aug. 8, 1990.
K035	All	Aug. 8, 1990.
K036	Wastewater	June 8, 1989.
K036	Nonwastewater	Aug. 8, 1988.
K037	Wastewater	Aug. 8, 1988.
K037	Nonwastewater	Aug. 8, 1988.
K038	All	June 8, 1989.
K039	All	June 8, 1989.
K040	All	June 8, 1989.
K041	All	Aug. 8, 1990.
K042	All	Aug. 8, 1990.
K043	All	June 8, 1989.
K044	All	Aug. 8, 1988.
K045	All	Aug. 8, 1988.
K046 (Nonreactive)	Nonwastewater	Aug. 8, 1988.
K046	All others	Aug. 8, 1990.
K047	All	Aug. 8, 1988.
K048	Wastewater	Aug. 8, 1990.
K048	Nonwastewater	Nov. 8, 1990.
K049	Wastewater	Aug. 8, 1990.
K049	Nonwastewater	Nov. 8, 1990.
K050	Wastewater	Aug. 8, 1990.
K050	Nonwastewater	Nov. 8, 1990.
K051	Wastewater	Aug. 8, 1990.
K051	Nonwastewater	Nov. 8, 1990.
K052	Wastewater	Aug. 8, 1990.

K052	Nonwastewater	Nov. 8, 1990.
K060	Wastewater	Aug. 8, 1990.
K060	Nonwastewater	Aug. 8, 1988.
K061	Wastewater	Aug. 8, 1990.
K061	Nonwastewater	June 30, 1992.
K062	All	Aug. 8, 1988.
K069 (Non-Calcium Sulfate)		
	Nonwastewater	Aug. 8, 1988.
K069	All others	Aug. 8, 1990.
K071	All	Aug. 8, 1990.
K073	All	Aug. 8, 1990.
K083	All	Aug. 8, 1990.
K084	Wastewater	Aug. 8, 1990.
K084	Nonwastewater	May 8, 1992.
K085	All	Aug. 8, 1990.
K086 (organics) ^b	All	Aug. 8, 1988.
K086	All others	Aug. 8, 1988.
K087	All	Aug. 8, 1988.
K088	Mixed with radioactive waste	Apr. 8, 1998.
K088	All others	Jan. 8, 1997.
K093	All	June 8, 1989.
K094	All	June 8, 1989.
K095	Wastewater	Aug. 8, 1990.
K095	Nonwastewater	June 8, 1989.
K096	Wastewater	Aug. 8, 1990.
K096	Nonwastewater	June 8, 1989.
K097	All	Aug. 8, 1990.
K098	All	Aug. 8, 1990.
K099	All	Aug. 8, 1988.
K100	Wastewater	Aug. 8, 1990.
K100	Nonwastewater	Aug. 8, 1988.
K101 (organics)	Wastewater	Aug. 8, 1988.
K101 (metals)	Wastewater	Aug. 8, 1990.
K101 (organics)	Nonwastewater	Aug. 8, 1988.
K101 (metals)	Nonwastewater	May 8, 1992.
K102 (organics)	Wastewater	Aug. 8, 1988.
K102 (metals)	Wastewater	Aug. 8, 1990.
K102 (organics)	Nonwastewater	Aug. 8, 1988.
K102 (metals)	Nonwastewater	May 8, 1992.
K103	All	Aug. 8, 1988.
K104	All	Aug. 8, 1988.
K105	All	Aug. 8, 1990.
K106	Wastewater	Aug. 8, 1990.
K106	Nonwastewater	May 8, 1992.
K107	Mixed with radioactive wastes	June 30, 1994.
K107	All others	Nov. 9, 1992.
K108	Mixed with radioactive wastes	June 30, 1994.
K108	All others	Nov. 9, 1992.
K109	Mixed with radioactive wastes	June 30, 1994.
K109	All others	Nov. 9, 1992.
K110	Mixed with radioactive wastes	June 30, 1994.
K110	All others	Nov. 9, 1992.
K111	Mixed with radioactive wastes	June 30, 1994.
K111	All other	Nov. 9, 1992.
K112	Mixed with radioactive wastes	June 30, 1994.
K112	All other	Nov. 9, 1992.
K113	All	June 8, 1989.
K114	All	June 8, 1989.
K115	All	June 8, 1989.
K116	All	June 8, 1989.
K117	Mixed with radioactive wastes	June 30, 1994.
K117	All others	Nov. 9, 1992.
K118	Mixed with radioactive wastes	June 30, 1994.

K118	All others	Nov. 9, 1992.
K123	Mixed with radioactive wastes	June 30, 1994.
K123	All others	Nov. 9, 1992.
K124	Mixed with radioactive wastes	June 30, 1994.
K124	All others	Nov. 9, 1992.
K125	Mixed with radioactive wastes	June 30, 1994.
K125	All others	Nov. 9, 1992.
K126	Mixed with radioactive wastes	June 30, 1994.
K126	All others	Nov. 9, 1992.
K131	Mixed with radioactive wastes	June 30, 1994.
K131	All others	Nov. 9, 1992.
K132	Mixed with radioactive wastes	June 30, 1994.
K132	All others	Nov. 9, 1992.
K136	Mixed with radioactive wastes	June 30, 1994.
K136	All others	Nov. 9, 1992.
K141	Mixed with radioactive wastes	Sep. 19, 1996.
K141	All others	Dec. 19, 1994.
K142	Mixed with radioactive wastes	Sep. 19, 1996.
K142	All others	Dec. 19, 1994.
K143	Mixed with radioactive wastes	Sep. 19, 1996.
K143	All others	Dec. 19, 1994.
K144	Mixed with radioactive wastes	Sep. 19, 1996.
K144	All others	Dec. 19, 1994.
K145	Mixed with radioactive wastes	Sep. 19, 1996.
K145	All others	Dec. 19, 1994.
K147	Mixed with radioactive wastes	Sep. 19, 1996.
K147	All others	Dec. 19, 1994.
K148	Mixed with radioactive wastes	Sep. 19, 1996.
K148	All others	Dec. 19, 1994.
K149	Mixed with radioactive wastes	Sep. 19, 1996.
K149	All others	Dec. 19, 1994.
K150	Mixed with radioactive wastes	Sep. 19, 1996.
K150	All others	Dec. 19, 1994.
K151	Mixed with radioactive wastes	Sep. 19, 1996.
K151	All others	Dec. 19, 1994.
K156	Mixed with radioactive wastes	Apr. 8, 1998.
K156	All others	July 8, 1996.
K157	Mixed with radioactive wastes	Apr. 8, 1998.
K157	All others	July 8, 1996.
K158	Mixed with radioactive wastes	Apr. 8, 1998.
K158	All others	July 8, 1996.
K159	Mixed with radioactive wastes	Apr. 8, 1998.
K159	All others	July 8, 1996.
K160	Mixed with radioactive wastes	Apr. 8, 1998.
K160	All others	July 8, 1996.
K161	Mixed with radioactive wastes	Apr. 8, 1998.
K161	All others	July 8, 1996.
P001	All	Aug. 8, 1990.
P002	All	Aug. 8, 1990.
P003	All	Aug. 8, 1990.
P004	All	Aug. 8, 1990.
P005	All	Aug. 8, 1990.
P006	All	Aug. 8, 1990.
P007	All	Aug. 8, 1990.
P008	All	Aug. 8, 1990.
P009	All	Aug. 8, 1990.
P010	Wastewater	Aug. 8, 1990.
P010	Nonwastewater	May 8, 1992.
P011	Wastewater	Aug. 8, 1990.
P011	Nonwastewater	May 8, 1992.
P012	Wastewater	Aug. 8, 1990.
P012	Nonwastewater	May 8, 1992.
P013 (barium)	Nonwastewater	Aug. 8, 1990.

P013	All	June 8, 1989.
P014	All	Aug. 8, 1990.
P015	All	Aug. 8, 1990.
P016	All	Aug. 8, 1990.
P017	All	Aug. 8, 1990.
P018	All	Aug. 8, 1990.
P020	All	Aug. 8, 1990.
P021	All	June 8, 1989.
P022	All	Aug. 8, 1990.
P023	All	Aug. 8, 1990.
P024	All	Aug. 8, 1990.
P026	All	Aug. 8, 1990.
P027	All	Aug. 8, 1990.
P028	All	Aug. 8, 1990.
P029	All	June 8, 1989.
P030	All	June 8, 1989.
P031	All	Aug. 8, 1990.
P033	All	Aug. 8, 1990.
P034	All	Aug. 8, 1990.
P036	Wastewater	Aug. 8, 1990.
P036	Nonwastewater	May 8, 1992.
P037	All	Aug. 8, 1990.
P038	Wastewater	Aug. 8, 1990.
P038	Nonwastewater	May 8, 1992.
P039	All	June 8, 1989.
P040	All	June 8, 1989.
P041	All	June 8, 1989.
P042	All	Aug. 8, 1990.
P043	All	June 8, 1989.
P044	All	June 8, 1989.
P045	All	Aug. 8, 1990.
P046	All	Aug. 8, 1990.
P047	All	Aug. 8, 1990.
P048	All	Aug. 8, 1990.
P049	All	Aug. 8, 1990.
P050	All	Aug. 8, 1990.
P051	All	Aug. 8, 1990.
P054	All	Aug. 8, 1990.
P056	All	Aug. 8, 1990.
P057	All	Aug. 8, 1990.
P058	All	Aug. 8, 1990.
P059	All	Aug. 8, 1990.
P060	All	Aug. 8, 1990.
P062	All	June 8, 1989.
P063	All	June 8, 1989.
P064	All	Aug. 8, 1990.
P065	Wastewater	Aug. 8, 1990.
P065	Nonwastewater	May 8, 1992.
P066	All	Aug. 8, 1990.
P067	All	Aug. 8, 1990.
P068	All	Aug. 8, 1990.
P069	All	Aug. 8, 1990.
P070	All	Aug. 8, 1990.
P071	All	June 8, 1989.
P072	All	Aug. 8, 1990.
P073	All	Aug. 8, 1990.
P074	All	June 8, 1989.
P075	All	Aug. 8, 1990.
P076	All	Aug. 8, 1990.
P077	All	Aug. 8, 1990.
P078	All	Aug. 8, 1990.
P081	All	Aug. 8, 1990.
P082	All	Aug. 8, 1990.

P084	All	Aug. 8, 1990.
P085	All	June 8, 1989.
P087	All	May 8, 1992.
P088	All	Aug. 8, 1990.
P089	All	June 8, 1989.
P092	Wastewater	Aug. 8, 1990.
P092	Nonwastewater	May 8, 1992.
P093	All	Aug. 8, 1990.
P094	All	June 8, 1989.
P095	All	Aug. 8, 1990.
P096	All	Aug. 8, 1990.
P097	All	June 8, 1989.
P098	All	June 8, 1989.
P099 (silver)	Wastewater	Aug. 8, 1990.
P099	All others	June 8, 1989.
P101	All	Aug. 8, 1990.
P102	All	Aug. 8, 1990.
P103	All	Aug. 8, 1990.
P104 (silver)	Wastewater	Aug. 8, 1990.
P104	All others	June 8, 1989.
P105	All	Aug. 8, 1990.
P106	All	June 8, 1989.
P108	All	Aug. 8, 1990.
P109	All	June 8, 1989.
P110	All	Aug. 8, 1990.
P111	All	June 8, 1989.
P112	All	Aug. 8, 1990.
P113	All	Aug. 8, 1990.
P114	All	Aug. 8, 1990.
P115	All	Aug. 8, 1990.
P116	All	Aug. 8, 1990.
P118	All	Aug. 8, 1990.
P119	All	Aug. 8, 1990.
P120	All	Aug. 8, 1990.
P121	All	June 8, 1989.
P122	All	Aug. 8, 1990.
P123	All	Aug. 8, 1990.
P127	Mixed with radioactive waste	Apr. 8, 1998.
P127	All others	July 8, 1996.
P128	Mixed with radioactive wastes	Apr. 8, 1998.
P128	All others	July 8, 1996.
P185	Mixed with radioactive wastes	Apr. 8, 1998.
P185	All others	July 8, 1996.
P188	Mixed with radioactive wastes	Apr. 8, 1998.
P188	All others	July 8, 1996.
P189	Mixed with radioactive wastes	Apr. 8, 1998.
P189	All others	July 8, 1996.
P190	Mixed with radioactive wastes	Apr. 8, 1998.
P190	All others	July 8, 1996.
P191	Mixed with radioactive wastes	Apr. 8, 1998.
P191	All others	July 8, 1996.
P192	Mixed with radioactive wastes	Apr. 8, 1998.
P192	All others	July 8, 1996.
P194	Mixed with radioactive wastes	Apr. 8, 1998.
P194	All others	July 8, 1996.
P196	Mixed with radioactive wastes	Apr. 8, 1998.
P196	All others	July 8, 1996.
P197	Mixed with radioactive wastes	Apr. 8, 1998.
P197	All others	July 8, 1996.
P198	Mixed with radioactive wastes	Apr. 8, 1998.
P198	All others	July 8, 1996.
P199	Mixed with radioactive wastes	Apr. 8, 1998.
P199	All others	July 8, 1996.

P201	Mixed with radioactive wastes	Apr. 8, 1998.
P201	All others	July 8, 1996.
P202	Mixed with radioactive wastes	Apr. 8, 1998.
P202	All others	July 8, 1996.
P203	Mixed with radioactive wastes	Apr. 8, 1998.
P203	All others	July 8, 1996.
P204	Mixed with radioactive wastes	Apr. 8, 1998.
P204	All others	July 8, 1996.
P205	Mixed with radioactive wastes	Apr. 8, 1998.
P205	All others	July 8, 1996.
U001	All	Aug. 8, 1990.
U002	All	Aug. 8, 1990.
U003	All	Aug. 8, 1990.
U004	All	Aug. 8, 1990.
U005	All	Aug. 8, 1990.
U006	All	Aug. 8, 1990.
U007	All	Aug. 8, 1990.
U008	All	Aug. 8, 1990.
U009	All	Aug. 8, 1990.
U010	All	Aug. 8, 1990.
U011	All	Aug. 8, 1990.
U012	All	Aug. 8, 1990.
U014	All	Aug. 8, 1990.
U015	All	Aug. 8, 1990.
U016	All	Aug. 8, 1990.
U017	All	Aug. 8, 1990.
U018	All	Aug. 8, 1990.
U019	All	Aug. 8, 1990.
U020	All	Aug. 8, 1990.
U021	All	Aug. 8, 1990.
U022	All	Aug. 8, 1990.
U023	All	Aug. 8, 1990.
U024	All	Aug. 8, 1990.
U025	All	Aug. 8, 1990.
U026	All	Aug. 8, 1990.
U027	All	Aug. 8, 1990.
U028	All	June 8, 1989.
U029	All	Aug. 8, 1990.
U030	All	Aug. 8, 1990.
U031	All	Aug. 8, 1990.
U032	All	Aug. 8, 1990.
U033	All	Aug. 8, 1990.
U034	All	Aug. 8, 1990.
U035	All	Aug. 8, 1990.
U036	All	Aug. 8, 1990.
U037	All	Aug. 8, 1990.
U038	All	Aug. 8, 1990.
U039	All	Aug. 8, 1990.
U041	All	Aug. 8, 1990.
U042	All	Aug. 8, 1990.
U043	All	Aug. 8, 1990.
U044	All	Aug. 8, 1990.
U045	All	Aug. 8, 1990.
U046	All	Aug. 8, 1990.
U047	All	Aug. 8, 1990.
U048	All	Aug. 8, 1990.
U049	All	Aug. 8, 1990.
U050	All	Aug. 8, 1990.
U051	All	Aug. 8, 1990.
U052	All	Aug. 8, 1990.
U053	All	Aug. 8, 1990.
U055	All	Aug. 8, 1990.
U056	All	Aug. 8, 1990.

U057	All.....	Aug. 8, 1990.
U058	All.....	June 8, 1989.
U059	All.....	Aug. 8, 1990.
U060	All.....	Aug. 8, 1990.
U061	All.....	Aug. 8, 1990.
U062	All.....	Aug. 8, 1990.
U063	All.....	Aug. 8, 1990.
U064	All.....	Aug. 8, 1990.
U066	All.....	Aug. 8, 1990.
U067	All.....	Aug. 8, 1990.
U068	All.....	Aug. 8, 1990.
U069	All.....	June 30, 1992.
U070	All.....	Aug. 8, 1990.
U071	All.....	Aug. 8, 1990.
U072	All.....	Aug. 8, 1990.
U073	All.....	Aug. 8, 1990.
U074	All.....	Aug. 8, 1990.
U075	All.....	Aug. 8, 1990.
U076	All.....	Aug. 8, 1990.
U077	All.....	Aug. 8, 1990.
U078	All.....	Aug. 8, 1990.
U079	All.....	Aug. 8, 1990.
U080	All.....	Aug. 8, 1990.
U081	All.....	Aug. 8, 1990.
U082	All.....	Aug. 8, 1990.
U083	All.....	Aug. 8, 1990.
U084	All.....	Aug. 8, 1990.
U085	All.....	Aug. 8, 1990.
U086	All.....	Aug. 8, 1990.
U087	All.....	June 8, 1989.
U088	All.....	June 8, 1989.
U089	All.....	Aug. 8, 1990.
U090	All.....	Aug. 8, 1990.
U091	All.....	Aug. 8, 1990.
U092	All.....	Aug. 8, 1990.
U093	All.....	Aug. 8, 1990.
U094	All.....	Aug. 8, 1990.
U095	All.....	Aug. 8, 1990.
U096	All.....	Aug. 8, 1990.
U097	All.....	Aug. 8, 1990.
U098	All.....	Aug. 8, 1990.
U099	All.....	Aug. 8, 1990.
U101	All.....	Aug. 8, 1990.
U102	All.....	June 8, 1989.
U103	All.....	Aug. 8, 1990.
U105	All.....	Aug. 8, 1990.
U106	All.....	Aug. 8, 1990.
U107	All.....	June 8, 1989.
U108	All.....	Aug. 8, 1990.
U109	All.....	Aug. 8, 1990.
U110	All.....	Aug. 8, 1990.
U111	All.....	Aug. 8, 1990.
U112	All.....	Aug. 8, 1990.
U113	All.....	Aug. 8, 1990.
U114	All.....	Aug. 8, 1990.
U115	All.....	Aug. 8, 1990.
U116	All.....	Aug. 8, 1990.
U117	All.....	Aug. 8, 1990.
U118	All.....	Aug. 8, 1990.
U119	All.....	Aug. 8, 1990.
U120	All.....	Aug. 8, 1990.
U121	All.....	Aug. 8, 1990.
U122	All.....	Aug. 8, 1990.

U123	All	Aug. 8, 1990.
U124	All	Aug. 8, 1990.
U125	All	Aug. 8, 1990.
U126	All	Aug. 8, 1990.
U127	All	Aug. 8, 1990.
U128	All	Aug. 8, 1990.
U129	All	Aug. 8, 1990.
U130	All	Aug. 8, 1990.
U131	All	Aug. 8, 1990.
U132	All	Aug. 8, 1990.
U133	All	Aug. 8, 1990.
U134	All	Aug. 8, 1990.
U135	All	Aug. 8, 1990.
U136	Wastewater	Aug. 8, 1990.
U136	Nonwastewater	May 8, 1992.
U137	All	Aug. 8, 1990.
U138	All	Aug. 8, 1990.
U140	All	Aug. 8, 1990.
U141	All	Aug. 8, 1990.
U142	All	Aug. 8, 1990.
U143	All	Aug. 8, 1990.
U144	All	Aug. 8, 1990.
U145	All	Aug. 8, 1990.
U146	All	Aug. 8, 1990.
U147	All	Aug. 8, 1990.
U148	All	Aug. 8, 1990.
U149	All	Aug. 8, 1990.
U150	All	Aug. 8, 1990.
U151	Wastewater	Aug. 8, 1990.
U151	Nonwastewater	May 8, 1992.
U152	All	Aug. 8, 1990.
U153	All	Aug. 8, 1990.
U154	All	Aug. 8, 1990.
U155	All	Aug. 8, 1990.
U156	All	Aug. 8, 1990.
U157	All	Aug. 8, 1990.
U158	All	Aug. 8, 1990.
U159	All	Aug. 8, 1990.
U160	All	Aug. 8, 1990.
U161	All	Aug. 8, 1990.
U162	All	Aug. 8, 1990.
U163	All	Aug. 8, 1990.
U164	All	Aug. 8, 1990.
U165	All	Aug. 8, 1990.
U166	All	Aug. 8, 1990.
U167	All	Aug. 8, 1990.
U168	All	Aug. 8, 1990.
U169	All	Aug. 8, 1990.
U170	All	Aug. 8, 1990.
U171	All	Aug. 8, 1990.
U172	All	Aug. 8, 1990.
U173	All	Aug. 8, 1990.
U174	All	Aug. 8, 1990.
U176	All	Aug. 8, 1990.
U177	All	Aug. 8, 1990.
U178	All	Aug. 8, 1990.
U179	All	Aug. 8, 1990.
U180	All	Aug. 8, 1990.
U181	All	Aug. 8, 1990.
U182	All	Aug. 8, 1990.
U183	All	Aug. 8, 1990.
U184	All	Aug. 8, 1990.
U185	All	Aug. 8, 1990.

U186	All	Aug. 8, 1990.
U187	All	Aug. 8, 1990.
U188	All	Aug. 8, 1990.
U189	All	Aug. 8, 1990.
U190	All	June 8, 1989.
U191	All	Aug. 8, 1990.
U192	All	Aug. 8, 1990.
U193	All	Aug. 8, 1990.
U194	All	June 8, 1989.
U196	All	Aug. 8, 1990.
U197	All	Aug. 8, 1990.
U200	All	Aug. 8, 1990.
U201	All	Aug. 8, 1990.
U202	All	Aug. 8, 1990.
U203	All	Aug. 8, 1990.
U204	All	Aug. 8, 1990.
U205	All	Aug. 8, 1990.
U206	All	Aug. 8, 1990.
U207	All	Aug. 8, 1990.
U208	All	Aug. 8, 1990.
U209	All	Aug. 8, 1990.
U210	All	Aug. 8, 1990.
U211	All	Aug. 8, 1990.
U213	All	Aug. 8, 1990.
U214	All	Aug. 8, 1990.
U215	All	Aug. 8, 1990.
U216	All	Aug. 8, 1990.
U217	All	Aug. 8, 1990.
U218	All	Aug. 8, 1990.
U219	All	Aug. 8, 1990.
U220	All	Aug. 8, 1990.
U221	All	June 8, 1989.
U222	All	Aug. 8, 1990.
U223	All	June 8, 1989.
U225	All	Aug. 8, 1990.
U226	All	Aug. 8, 1990.
U227	All	Aug. 8, 1990.
U228	All	Aug. 8, 1990.
U234	All	Aug. 8, 1990.
U235	All	June 8, 1989.
U236	All	Aug. 8, 1990.
U237	All	Aug. 8, 1990.
U238	All	Aug. 8, 1990.
U239	All	Aug. 8, 1990.
U240	All	Aug. 8, 1990.
U243	All	Aug. 8, 1990.
U244	All	Aug. 8, 1990.
U246	All	Aug. 8, 1990.
U247	All	Aug. 8, 1990.
U248	All	Aug. 8, 1990.
U249	All	Aug. 8, 1990.
U271	Mixed with radioactive wastes	Apr. 8, 1998.
U271	All others	July 8, 1996.
U277	Mixed with radioactive wastes	Apr. 8, 1998.
U277	All others	July 8, 1996.
U278	Mixed with radioactive wastes	Apr. 8, 1998.
U278	All others	July 8, 1996.
U279	Mixed with radioactive wastes	Apr. 8, 1998.
U279	All others	July 8, 1996.
U280	Mixed with radioactive wastes	Apr. 8, 1998.
U280	All others	July 8, 1996.
U328	Mixed with radioactive wastes	June 30, 1994.
U328	All others	Nov. 9, 1992.

U353	Mixed with radioactive wastes	June 30, 1994.
U353	All others	Nov. 9, 1992.
U359	Mixed with radioactive wastes	June 30, 1994.
U359	All others	Nov. 9, 1992.
U364	Mixed with radioactive wastes	Apr. 8, 1998.
U364	All others	July 8, 1996.
U365	Mixed with radioactive wastes	Apr. 8, 1998.
U365	All others	July 8, 1996.
U366	Mixed with radioactive wastes	Apr. 8, 1998.
U366	All others	July 8, 1996.
U367	Mixed with radioactive wastes	Apr. 8, 1998.
U367	All others	July 8, 1996.
U372	Mixed with radioactive wastes	Apr. 8, 1998.
U372	All others	July 8, 1996.
U373	Mixed with radioactive wastes	Apr. 8, 1998.
U373	All others	July 8, 1996.
U375	Mixed with radioactive wastes	Apr. 8, 1998.
U375	All others	July 8, 1996.
U376	Mixed with radioactive wastes	Apr. 8, 1998.
U376	All others	July 8, 1996.
U377	Mixed with radioactive wastes	Apr. 8, 1998.
U377	All others	July 8, 1996.
U378	Mixed with radioactive wastes	Apr. 8, 1998.
U378	All others	July 8, 1996.
U379	Mixed with radioactive wastes	Apr. 8, 1998.
U379	All others	July 8, 1996.
U381	Mixed with radioactive wastes	Apr. 8, 1998.
U381	All others	July 8, 1996.
U382	Mixed with radioactive wastes	Apr. 8, 1998.
U382	All others	July 8, 1996.
U383	Mixed with radioactive wastes	Apr. 8, 1998.
U383	All others	July 8, 1996.
U384	Mixed with radioactive wastes	Apr. 8, 1998.
U384	All others	July 8, 1996.
U385	Mixed with radioactive wastes	Apr. 8, 1998.
U385	All others	July 8, 1996.
U386	Mixed with radioactive wastes	Apr. 8, 1998.
U386	All others	July 8, 1996.
U387	Mixed with radioactive wastes	Apr. 8, 1998.
U387	All others	July 8, 1996.
U389	Mixed with radioactive wastes	Apr. 8, 1998.
U389	All others	July 8, 1996.
U390	Mixed with radioactive wastes	Apr. 8, 1998.
U390	All others	July 8, 1996.
U391	Mixed with radioactive wastes	Apr. 8, 1998.
U391	All others	July 8, 1996.
U392	Mixed with radioactive wastes	Apr. 8, 1998.
U392	All others	July 8, 1996.
U393	Mixed with radioactive wastes	Apr. 8, 1998.
U393	All others	July 8, 1996.
U394	Mixed with radioactive wastes	Apr. 8, 1998.
U394	All others	July 8, 1996.
U395	Mixed with radioactive wastes	Apr. 8, 1998.
U395	All others	July 8, 1996.
U396	Mixed with radioactive wastes	Apr. 8, 1998.
U396	All others	July 8, 1996.
U400	Mixed with radioactive wastes	Apr. 8, 1998.
U400	All others	July 8, 1996.
U401	Mixed with radioactive wastes	Apr. 8, 1998.
U401	All others	July 8, 1996.
U402	Mixed with radioactive wastes	Apr. 8, 1998.
U402	All others	July 8, 1996.
U403	Mixed with radioactive wastes	Apr. 8, 1998.

U403	All others	July 8, 1996.
U404	Mixed with radioactive wastes	Apr. 8, 1998.
U404	All others	July 8, 1996.
U407	Mixed with radioactive wastes	Apr. 8, 1998.
U407	All others	July 8, 1996.
U409	Mixed with radioactive wastes	Apr. 8, 1998.
U409	All others	July 8, 1996.
U410	Mixed with radioactive wastes	Apr. 8, 1998.
U410	All others	July 8, 1996.
U411	Mixed with radioactive wastes	Apr. 8, 1998.
U411	All others	July 8, 1996.

^a This table does not include mixed radioactive wastes (from the First, Second, and Third Third rules) which received national capacity variance until May 8, 1992. This table also does not include contaminated soil and debris wastes.

^b The standard was revised in the Third Third Final Rule (55 FR 22520, June 1, 1990).

^c The standard was revised in the Third Third Emergency Rule (58 FR 29860, May 24, 1993); the original effective date was August 8, 1990.

^d The standard was revised in the Phase II Final Rule (59 FR 47982, Sept. 19, 1994); the original effective date was August 8, 1990.

^e The standards for selected reactive wastes was revised in the Phase III Final Rule (61 FR 15566, Apr. 8, 1996); the original effective date was August 8, 1990.

Table 2. – Summary of Effective Dates of Land Disposal Restrictions for Contamination Soil and Debris (CSD)

Restricted hazardous waste in CSD	Effective date
1. Solvent–(F001–F005) and dioxin–(F020–5023 and F026–F028) containing soil and debris from CERCLA response of RCRA corrective actions.	Nov. 8, 1990.
2. Soil and debris not from CERCLA response or RCRA corrective actions contaminated with less than 1% total solvents (F001–F005) or dioxins (F020–F023 and F026–F028).	Nov. 8, 1988.
3. Soil and debris contaminated with California list HOC's from CERCLA response or RCRA corrective actions.	Nov. 8, 1990.
4. Soil and debris contaminated with California list HOC's not from CERCLA response or RCRA corrective actions.	July 8, 1989.
5. All soil and debris contaminated with First Third wastes for which treatment standards are based on incineration.	Aug. 8, 1990.
6. All soil and debris contaminated with Second Third wastes for which treatment standards are based on incineration.	June 8, 1991.
7. All soil and debris contaminated with Third Third wastes or, First or Second Third “soft hammer” wastes which had treatment standards promulgated in the Third Third rule, for which treatment standards are based on incineration, vitrification, or mercury retorting, acid leaching followed by chemical precipitation, or thermal recovery of metals, as well as all inorganic solids debris contaminated with D004–D011 wastes, and all soil and debris contaminated with mixed RCRA/radioactive wastes.	May 8, 1992.

Note: 1. Appendix VII is provided for the convenience of the reader.

2. Contaminated Soil and Debris Rule will be promulgated in the future.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

Appendix VIII. National Capacity LDR Variance for UIC Wastes

National Capacity LDR Variances for UIC Wastes ^A		
Waste code	Waste category	Effective date
F001–F005	All spent F001–F005 solvent containing less than 1 percent total F001–F005 solvent constituents.	Aug. 8, 1990.

Waste code	Waste category	Effective date
D001 (except High TOC Ignitable Liquids Subcategory).	All	Feb. 10, 1994.
D001 (High TOC Ignitable Characteristic Liquids Subcategory).	Nonwastewater	Sept. 19, 1995.
D002B	All	May 8, 1992.
D002B	All	Feb. 10, 1994.
D003 (cyanides)	All	May 8, 1992.
D003 (sulfides)	All	May 8, 1992.
D003 (explosives, reactives)	All	May 8, 1992.
D007	All	May 8, 1992.
D009	Nonwastewater	May 8, 1992.
D012	All	Sept. 19, 1995.
D013	All	Sept. 19, 1995.
D014	All	Sept. 19, 1995.
D015	All	Sept. 19, 1995.
D016	All	Sept. 19, 1995.
D017	All	Sept. 19, 1995.
D018	All, including mixed with radioactive wastes.....	Apr. 8, 1998.
D019	All, including mixed with radioactive wastes.....	Apr. 8, 1998.
D020	All, including mixed with radioactive wastes.....	Apr. 8, 1998.
D021	All, including mixed with radioactive wastes.....	Apr. 8, 1998.
D022	All, including mixed with radioactive wastes.....	Apr. 8, 1998.
D023	All, including mixed radioactive wastes	Apr. 8, 1998.
D024	All, including mixed radioactive wastes	Apr. 8, 1998.
D025	All, including mixed radioactive wastes	Apr. 8, 1998.
D026	All, including mixed radioactive wastes	Apr. 8, 1998.
D027	All, including mixed radioactive wastes	Apr. 8, 1998.
D028	All, including mixed radioactive wastes	Apr. 8, 1998.
D029	All, including mixed radioactive wastes	Apr. 8, 1998.
D030	All, including mixed radioactive wastes	Apr. 8, 1998.
D031	All, including mixed radioactive wastes	Apr. 8, 1998.
D032	All, including mixed radioactive wastes	Apr. 8, 1998.
D033	All, including mixed radioactive wastes	Apr. 8, 1998.
D034	All, including mixed radioactive wastes	Apr. 8, 1998.
D035	All, including mixed radioactive wastes	Apr. 8, 1998.
D036	All, including mixed radioactive wastes	Apr. 8, 1998.
D037	All, including mixed radioactive wastes	Apr. 8, 1998.
D038	All, including mixed radioactive wastes	Apr. 8, 1998.
D039	All, including mixed radioactive wastes	Apr. 8, 1998.

Waste code	Waste category	Effective date
D040	All, including mixed radioactive wastes	Apr. 8, 1998.
D041	All, including mixed radioactive wastes	Apr. 8, 1998.
D042	All, including mixed radioactive wastes	Apr. 8, 1998.
D043	All, including mixed radioactive wastes	Apr. 8, 1998.
F007	All	June 8, 1991.
F032	All, including mixed radioactive wastes	May 12, 1999.
F034	All, including mixed radioactive wastes	May 12, 1999.
F035	All, including mixed radioactive wastes	May 12, 1999.
F037	All	Nov. 8, 1992.
F038	All	Nov. 8, 1992.
F039	Wastewater	May 8, 1992.
K009	Wastewater	June 8, 1991.
K011	Nonwastewater	June 8, 1991.
K011	Wastewater	May 8, 1992.
K013	Nonwastewater	June 8, 1991.
K013	Wastewater	May 8, 1992.
K014	All	May 8, 1992.
K016 (dilute)	All	June 8, 1991.
K049	All	Aug. 8, 1990.
K050	All	Aug. 8, 1990.
K051	All	Aug. 8, 1990.
K052	All	Aug. 8, 1990.
K062	All	Aug. 8, 1990.
K071	All	Aug. 8, 1990.
K088	All	Jan. 8, 1997.
K104	All	Aug. 8, 1990.
K107	All	Nov. 8, 1992.
K108	All	Nov. 9, 1992.
K109	All	Nov. 9, 1992.
K110	All	Nov. 9, 1992.
K111	All	Nov. 9, 1992.
K112	All	Nov. 9, 1992.
K117	All	June 30, 1995.
K118	All	June 30, 1995.
K123	All	Nov. 9, 1992.
K124	All	Nov. 9, 1992.
K125	All	Nov. 9, 1992.
K126	All	Nov. 9, 1992.
K131	All	June 30, 1995.
K132	All	June 30, 1995.
K136	All	Nov. 9, 1992.
K141	All	Dec. 19, 1994.
K142	All	Dec. 19, 1994.
K143	All	Dec. 19, 1994.
K144	All	Dec. 19, 1994.
K145	All	Dec. 19, 1994.
K147	All	Dec. 19, 1994.
K148	All	Dec. 19, 1994.
K149	All	Dec. 19, 1994.
K150	All	Dec. 19, 1994.
K151	All	Dec. 19, 1994.

Waste code	Waste category	Effective date
K156	All	July 8, 1996.
K157	All	July 8, 1996.
K158	All	July 8, 1996.
K159	All	July 8, 1996.
K160	All	July 8, 1996.
K161	All	July 8, 1996.
P127	All	July 8, 1996.
P128	All	July 8, 1996.
P185	All	July 8, 1996.
P188	All	July 8, 1996.
P189	All	July 8, 1996.
P190	All	July 8, 1996.
P191	All	July 8, 1996.
P192	All	July 8, 1996.
P194	All	July 8, 1996.
P196	All	July 8, 1996.
P197	All	July 8, 1996.
P198	All	July 8, 1996.
P199	All	July 8, 1996.
P201	All	July 8, 1996.
P202	All	July 8, 1996.
P203	All	July 8, 1996.
P204	All	July 8, 1996.
P205	All	July 8, 1996.
U271	All	July 8, 1996.
U277	All	July 8, 1996.
U278	All	July 8, 1996.
U279	All	July 8, 1996.
U280	All	July 8, 1996.
U328	All	Nov. 9, 1992.
U353	All	Nov. 9, 1992.
U359	All	Nov. 9, 1992.
U364	All	July 8, 1996.
U365	All	July 8, 1996.
U366	All	July 8, 1996.
U367	All	July 8, 1996.
U372	All	July 8, 1996.
U373	All	July 8, 1996.
U375	All	July 8, 1996.
U376	All	July 8, 1996.
U377	All	July 8, 1996.
U378	All	July 8, 1996.
U379	All	July 8, 1996.
U381	All	July 8, 1996.
U382	All	July 8, 1996.
U383	All	July 8, 1996.
U384	All	July 8, 1996.
U385	All	July 8, 1996.
U386	All	July 8, 1996.
U387	All	July 8, 1996.
U389	All	July 8, 1996.
U390	All	July 8, 1996.
U391	All	July 8, 1996.
U392	All	July 8, 1996.
U395	All	July 8, 1996.
U396	All	July 8, 1996.

Waste code	Waste category	Effective date
U400	All	July 8, 1996.
U401	All	July 8, 1996.
U402	All	July 8, 1996.
U403	All	July 8, 1996.
U404	All	July 8, 1996.
U407	All	July 8, 1996.
U409	All	July 8, 1996.
U410	All	July 8, 1996.
U411	All	July 8, 1996.

^A Wastes that are deep well disposed on-site receive a six-month variance, with restrictions effective in November 1990.

^B Deepwell injected D002 liquids with a pH less than 2 must meet the Carolina List treatment standards on August 8, 1990.

Note: This table is provided for the convenience of the reader.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

Appendix IX. Extraction Procedure (EP) Toxicity Test Method and Structural Integrity Test (SW-846, Method 1310A)

Note: Appendix IX – Removed upon promulgation of SW-846; remove from SC Text 12/92.

Note: The EP (Method 1310) is published in “Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,” EPA Publication SW-846, as incorporated by reference in R. 61-79.260.11.

**Appendix XI. Metal Bearing Wastes Prohibited From Dilution in a Combustion Unit
According to 268.3(c) ¹**

Waste code	Waste description
D004	Toxicity Characteristic for Arsenic.
D005	Toxicity Characteristic for Barium.
D006	Toxicity Characteristic for Cadmium.
D007	Toxicity Characteristic for Chromium.
D008	Toxicity Characteristic for Lead.
D009	Toxicity Characteristic for Mercury.
D010	Toxicity Characteristic for Selenium.
D011	Toxicity Characteristic for Silver.
F006	Wastewater treatment sludges from electroplating operations except from the following processes: (1) sulfuric acid anodizing of aluminum; (2) tin plating carbon steel; (3) zinc plating (segregated basis) on carbon steel; (4) aluminum or zinc-plating on carbon steel; (5) cleaning/stripping associated with tin, zinc and aluminum plating on carbon steel; and (6) chemical etching and milling of aluminum.
F007	Spent cyanide plating bath solutions from electroplating operations.
F008	Plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process.
F009	Spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process.
F010	Quenching bath residues from oil baths from metal treating operations where cyanides are used in the process.
F011	Spent cyanide solutions from salt bath pot cleaning from metal heat treating operations.
F012	Quenching waste water treatment sludges from metal heat treating operations where cyanides are used in the process.
F019	Wastewater treatment sludges from the chemical conversion coating of aluminum except from zirconium phosphating in aluminum car washing when such phosphating is an exclusive conversion coating process.
K002	Wastewater treatment sludge from the production of chrome yellow and orange pigments.
K003	Wastewater treatment sludge from the production of molybdate orange pigments.
K004	Wastewater treatment sludge from the production of zinc yellow pigments.
K005	Wastewater treatment sludge from the production of chrome green pigments.
K006	Wastewater treatment sludge from the production of chrome oxide green pigments (anhydrous and hydrated).
K007	Wastewater treatment sludge from the production of iron blue pigments.
K008	Oven residue from the production of chrome oxide green pigments.
K061	Emission control dust/sludge from the primary production of steel in electric furnaces.
K069	Emission control dust/sludge from secondary lead smelting.
K071	Brine purification muds from the mercury cell processes in chlorine production, where separately prepurified brine is not used.
K100	Waste leaching solution from acid leaching of emission control dust/sludge from secondary lead smelting.
K106	Sludges from the mercury cell processes for making chlorine.
P010	Arsenic acid H_3AsO_4
P011	Arsenic oxide As_2O_5
P012	Arsenic trioxide
P013	Barium cyanide
P015	Beryllium
P029	Copper cyanide $Cu(CN)$
P074	Nickel cyanide $Ni(CN)_2$
P087	Osmium tetroxide
P099	Potassium silver cyanide
P104	Silver cyanide
P113	Thallic oxide

Waste code	Waste description
P114	Thallium (I) selenite
P115	Thallium (I) sulfate
P119	Ammonium vanadate
P120	Vanadium oxide V ₂ O ₅
P121	Zinc cyanide.
U032	Calcium chromate.
U145	Lead phosphate.
U151	Mercury.
U204	Selenious acid.
U205	Selenium disulfide.
U216	Thallium (I) chloride.
U217	Thallium (I) nitrate.

¹A combustion unit is defined as any thermal technology subject to part 264, subpart O; Part 265, subpart O; and/or 266, subpart H.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

61-79.270. PERMIT REQUIREMENTS.

SUBPART A General Information

270.1. Purpose and scope of these regulations.

(a) Coverage

(1) The regulations in this part cover basic permitting requirements, such as application requirements, standard permit conditions, and monitoring and reporting requirements. These regulations are part of a regulatory scheme implementing RCRA in the State of South Carolina, as set forth in different parts of the South Carolina Hazardous Waste Management Regulations (SCHWMR), R.61-79. The following chart indicates where the regulations implementing RCRA appear in the SCHWMR. (revised 12/92)

Appendix A-12: Purpose and Scope of Regulations

Section of RCRA	Coverage	Final regulation as appears in R.61-79 (SCHWMR)
Subtitle C	Overview and definitions	R.61-79.260
3001	Identification and listing of hazardous waste	R.61-79.261
3002	Generators of hazardous waste	R.61-79.262
3003	Transporters of hazardous waste	R.61-79.263
3004	Standards for HWM facilities	R.61-79.264, .265, and .266
3005	Permit requirements for HWM facilities	R.61-79.270 and R.61-79.124
3010	Preliminary notification of HWM activity	§ 44-56-120; 45 FR 12746 February 26, 1980

(2) Technical regulations. The permit program under these regulations has separate additional regulations that contain technical requirements. These separate regulations are used by the Department to determine what requirements must be placed in permits if they are issued. These separate regulations are located in R.61-79.264, R.61-79.266.

(3) Technical regulations. The RCRA permit program has separate additional regulations that contain technical requirements. These separate regulations are used by permit issuing authorities to determine what requirements must be placed in permits if they are issued. These separate regulations are located in R.61-79.264, 266, and 268.

(b) Overview of the Permit Program. Not later than 90 days after the promulgation or revision of regulations in part 261 (identifying and listing hazardous wastes) generators and transporters of

hazardous waste, and owners or operators of hazardous waste treatment, storage, or disposal facilities may be required to file a notification of that activity under South Carolina section 44-56-60 and section 3010 of RCRA. Six months after the initial promulgation of the R.61-79.261 regulations, transporting, treatment, storage, or disposal of hazardous waste by any person who has not applied for or received a permit under these regulations is prohibited. A permit application for a facility consists of two parts, Part A (see section 270.13) and Part B (see section 270.14 and applicable sections in 270.15 through 270.29). For “existing HWM facilities,” the requirement to submit an application is satisfied by submitting only Part A of the permit application until the date the Department sets for submitting Part B of the application. (Part A consists of Forms 1 and 3 of the Consolidated Permit Application Forms.) Timely submission of both notification under § 44-56-60 and under section 3010 and Part A qualifies owners and operators of existing HWM facilities (who are required to have a permit under these regulations) for interim status under SC § 44-56-60 and 3005(e) of RCRA. Facility owners and operators with interim status are treated as having been issued a permit until the Department makes a final determination on the permit application. Facility owners and operators with interim status must comply with interim status standards set forth at R.61-79.265 and .266. Facility owners and operators with interim status are not relieved from complying with other State requirements. For existing HWM facilities, the Department shall set a date, giving at least six months notice, for submission of Part B of the application. There is no form for Part B of the application; rather, Part B must be submitted in narrative form and contain the information set forth in the applicable Sections 270.14 through 270.29. Owners or operators of new HWM facilities must submit parts A and B of the permit application at least 180 days before physical construction is expected to commence. (revised 12/92)

(c) Scope of the Permit Requirement.

The Department requires a permit under these regulations for the “transportation,” “treatment,” “storage,” or “disposal” of any “hazardous waste” as identified or listed in 261. The terms “transportation,” “treatment,” “storage,” “disposal,” and “hazardous waste” are defined in 260 Subpart B and 270.2. Owners and operators of hazardous waste management units must have permits during the active life (including the closure period) of the unit. Owners and operators of surface impoundments, landfills, land treatment units, and waste pile units that received wastes after July 26, 1982, or that certified closure (according to 265.115) after January 26, 1983, must have postclosure permits unless they demonstrate closure by removal or decontamination as provided under 270.1(c) (5) and (6). If a postclosure permit is required, the permit must address applicable part 264 groundwater monitoring, unsaturated zone monitoring, corrective action, and postclosure care requirements of this chapter. The denial of a permit for the active life of a hazardous waste management facility or unit does not affect the requirement to obtain a postclosure permit under this section. (11/90; 12/92; 12/93; 8/00)

(1) Specific inclusions. Owners and operators of certain facilities require hazardous waste permits as well as permits under other programs for certain aspects of facility operation. Hazardous waste permits are required for:

(i) Injection wells that dispose of hazardous waste, and associated surface facilities that treat, store or dispose of hazardous waste. However, the owner and operator with a state approved UIC permit will be deemed to have a hazardous waste permit for the injection well itself if they comply with the requirements of Section 270.60(b).

(ii) Treatment, storage, or disposal of hazardous waste at facilities requiring an NPDES permit. However, the owner and operator of a publicly owned treatment works receiving hazardous wastes will be deemed to have a hazardous waste permit for that waste if they comply with the requirements of 270.60(c).

(iii) Barges or vessels that dispose of hazardous waste by ocean disposal and on shore hazardous waste treatment or storage facilities associated with an ocean disposal operation. However, the owner and operator will be deemed to have a hazardous waste permit for ocean disposal from the barge or vessel itself if they comply with the requirements of Section 270.60(a) (permit-by-rule for ocean disposal barges and vessels). (revised 12/92)

(2) Specific exclusions and exemptions. The following persons are among those who are not required to obtain a RCRA permit under these regulations:

(i) Generators who accumulate hazardous waste onsite in compliance with all of the conditions for exemption provided in R.61-79.262.14, 262.15, 262.16, and 262.17.

(ii) Farmers who dispose of hazardous waste pesticides from their own use as provided in R.61-79.262.70.

(iii) Persons who own or operate facilities solely for the treatment, storage or disposal of hazardous waste excluded from regulations under this Part by R.61-79.261.4 or 262.14 (very small quantity generator exemption).

(iv) Owners or operators of totally enclosed treatment facilities as defined in R.61-79.260.10.

(v) Owners and operators of elementary neutralization units or wastewater treatment units as defined in R.61-79.260.10.

(vi) Transporters storing manifested shipments of hazardous waste in containers meeting the requirements of R.61-79.262.30 at a transfer facility for a period of ten days or less.

(vii) Persons adding absorbent material to waste in a container (as defined in R.61-79.260.10) and persons adding waste to absorbent material in a container, provided that these actions occur at the time waste is first placed in the container; and R.61-79.264.17(b), 264.171, and 264.172 are complied with.

(viii) Universal waste handlers and universal waste transporters (as defined in R.61-79.260.10) managing the wastes listed below. These handlers are subject to regulation under R.61-79.273.

(A) Batteries as described in 273.2;

(B) Pesticides as described in 273.3;

(C) Mercury-containing equipment as described in 273.4;

(D) Lamps as described in 273.5; and

(E) Aerosol cans as described in 273.6 of this chapter.

(ix) Any transporter who does not accept or deliver any hazardous waste within the State. (revised 5/96)

(x) Reverse distributors accumulating potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals, as defined in Section 266.500. Reverse distributors are subject to regulation under part 266, subpart P for the accumulation of potentially creditable hazardous waste pharmaceuticals and evaluated hazardous waste pharmaceuticals.

(xi) Any transporter who moves hazardous waste only on the site of a hazardous waste generator or a permitted hazardous waste treatment, storage or disposal facility.

(3) Further exclusions.

(i) A person is not required to obtain a permit for treatment or containment activities during immediate response to any of the following situations:

(A) A discharge of a hazardous waste;

(B) An imminent and substantial threat of a discharge of hazardous waste;

(C) A discharge of a material which when discharged, becomes a hazardous waste.

(D) An immediate threat to human health, public safety, property, or the environment from the known or suspected presence of military munitions, other explosive material, or an explosive device, as determined by an explosive or munitions emergency response specialist as defined in 260.10.

(ii) Any person who continues or initiates hazardous waste treatment or containment activities after the immediate response is over is subject to all applicable requirements of these Regulations for those activities.

(iii) In the case of emergency responses involving military munitions, the responding military emergency response specialist's organizational unit must retain records for three years identifying the dates of the response, the responsible persons responding, the type and description of material addressed, and its disposition.

(4) Permits for less than an entire facility. The Department may issue or deny a permit for one or more units at a facility without simultaneously issuing or denying a permit to all of the units at the facility. The interim status of any unit for which a permit has not been issued or denied is not affected by the issuance or denial of a permit to any other unit at the facility.

(5) Closure by removal. (amended 11/90) Owners/operators of surface impoundments, land treatment units, and waste piles closing by removal or decontamination under 265 standards must obtain a post-closure permit unless they can demonstrate to the Department that the closure met the standards for closure by removal or decontamination in 264.228, 264.280(e) or 264.258, respectively. The demonstration may be made in the following ways:

(i) If the owner/operator has submitted a Part B application for a postclosure permit, the owner/operator may request a determination, based on information contained in the application, that 264 closure by removal standards were met. If the Department believes that 264 standards were met, it will notify the public of this proposed decision, allow for public comment, and reach a final determination according to the procedures in paragraph (c)(6) of this section.

(ii) If the owner/operator has not submitted a Part B application for a post-closure permit, the owner/operator may petition the Department for a determination that a post-closure permit is not required because the closure met the applicable Part 264 closure standards.

(A) The petition must include data demonstrating that closure by removal or decontamination standards were met, or it must demonstrate that the unit closed under State requirements that met or exceeded the applicable 264 closure-by-removal standard.

(B) The Department shall approve or deny the petition according to the procedures outlined in paragraph (c)(6) of this section.

(6) Procedures for closure equivalency determination.

(i) If a facility owner/operator seeks an equivalency demonstration under 270.1(c)(5), the Department will provide the public, through a newspaper notice, the opportunity to submit written comments on the information submitted by the owner/operator within 30 days from the date of the notice. The Department will also, in response to a request or at his/her own discretion, hold a public hearing whenever such a hearing might clarify one or more issues concerning the equivalence of the Part 265 closure to a Part 264 closure. The Department will give public notice of the hearing at least 30 days before it occurs. (Public notice of the hearing may be given at the same time as notice of the opportunity for the public to submit written comments, and the two notices may be combined.)

(ii) The Department will determine whether the Part 265 closure met 264 closure by removal or decontamination requirements within 90 days of its receipt. If the Department finds that the closure did not meet the applicable Part 264 standards, will provide the owner/operator with a written statement of the reasons why the closure failed to meet Part 264 standards. The owner/operator may submit additional information in support of an equivalency demonstration within 30 days after receiving such written statement. The Department will review any additional information submitted and make a final determination within 60 days.

(iii) If the Department determines that the facility did not close in accordance with Part 264 closure by removal standards, the facility is subject to post-closure requirements.

HISTORY: Amended by State Register 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 2, eff February 23, 2007; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 44-11 Doc. No. 4976, eff November 27, 2020; SCSR 45-5 Doc. No. 4975, eff May 28, 2021; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.2. Definitions.

The following definitions apply to R.61-79.270 and R.61-79.124. Terms not defined in this section have the meaning given by those included in R.61-79.260 Subpart B and by S.C. Hazardous Waste Management Act Section 44-56-10 et al.

“Application” means the standard forms for applying for a permit, including any additions, revisions or modifications to the forms; or forms approved by the Department, including any approved modifications or revisions. Application also includes the information required by the Department under Sections 270.14 through 270.29 (contents of Part B of the application).

Aquifer means a geological formation, group of formations, or part of a formation that is capable of yielding a significant amount of water to a well or spring.

“Closure” means the act of securing a Hazardous Waste Management facility pursuant to the requirements of Part 264.

“Component” means any constituent part of a unit of any group of constituent parts of a unit which are assembled to perform a specific function (e.g., a pump seal, pump, kiln liner, kiln thermocouple).

“Corrective Action Management Unit” or “CAMU” means an area within a facility that is designated by the Department under part 264 subpart S, for the purpose of implementing corrective action requirements under § 264.101 and RCRA section 3008(h). A CAMU shall only be used for the management of remediation wastes pursuant to implementing such corrective action requirements at the facility.

“CWA” means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act or Federal Water Pollution Control Act amendments of 1972) Pub. L. 92-500, as amended by Pub. L. 92-217 and Pub. L. 95-576; 33 U.S.C. 1251 et seq.

Disposal means the discharge, deposit, injection, dumping, spilling, leaking, or placing of any hazardous waste into or on any land or water so that such hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground water.

“Disposal facility” means a facility or part of a facility at which hazardous waste is intentionally placed into or on the land or water, and at which hazardous waste will remain after closure. The term disposal facility does not include a corrective action management unit into which remediation wastes are placed. (revised 12/92)

“Draft permit” means a document prepared under R.61-79.124.6 indicating the tentative decision to issue or deny, modify, revoke and reissue, terminate, or reissue a permit. A notice of intent to terminate a permit, and a notice of intent to deny a permit, as discussed in Section 124.5, are types of draft permits. A denial of a request for modification, revocation and reissuance, or termination, as discussed in Section 124.5 is not a “draft permit.” A proposed permit is not a draft permit.

“Elementary neutralization unit” means a device which: (a) is used for neutralizing wastes only because they exhibit the corrosivity characteristic defined in 261.22, or are listed in 261 Subpart D only for this reason; and (b) meets the definition of tank, tank system, container, transport vehicle, or vessel in 260.10.

“Emergency permit” means a permit issued in accordance with Section 270.61.

Environmental Protection Agency (EPA) means the United States Environmental Protection Agency.
EPA means the United States Environmental Protection Agency.

Existing hazardous waste management (HWM) facility or existing facility means a facility which was in operation or for which construction commenced on or before November 19, 1980. A facility has commenced construction if:

(a) The owner or operator has obtained the Federal, State and local approvals or permits necessary to begin physical construction; and either

(b)(1) A continuous onsite, physical construction program has begun; or

(2) The owner or operator has entered into contractual obligations which cannot be canceled or modified without substantial loss for physical construction of the facility to be completed within a reasonable time.

“Facility” or “activity” means any HWM facility or any other facility or activity (including land or appurtenances thereto) that is subject to regulation under these regulations.

“Facility mailing list” means the mailing list for a facility maintained by the Department in accordance with 124.10 (amended 11/90; edited ^{12/95}; 5/96).

“Federal, State and local approvals or permits necessary to begin physical construction” means permits and approvals required under Federal, State or local hazardous waste control statutes, regulations or ordinances.

“Functionally equivalent component” means a component which performs the same function or measurement and which meets or exceeds the performance specifications of another component.

Generator means any person, by site location, whose act, or process produces hazardous waste identified or listed in part 261.

Ground water means water below the land surface in a zone of saturation.

Hazardous waste means a hazardous waste as defined in 261.3.

“Hazardous Waste Management facility (HWM facility)” means all contiguous land, and structures, other appurtenances, and improvements on the land, used for treating, storing, or disposing of hazardous waste. A facility may consist of several treatment, storage, or disposal operational units (for example, one or more landfills, surface impoundments, or combinations of them).

HWM facility means Hazardous Waste Management facility.

Injection well means a well into which fluids are being injected.

In operation means a facility which is treating, storing, or disposing of hazardous waste.

“Interim authorization” means approval by EPA of a State hazardous waste program which has met the requirements of section 3006(g)(2) of RCRA and applicable requirements of part 271, subpart B. (added 5/96)

Manifest means the shipping document originated and signed by the generator which contains the information required by subpart B of part 262.

“Major facility” means any facility or activity classified by the Department.

National Pollutant Discharge Elimination System means the national program for issuing, modifying, revoking and reissuing, terminating, monitoring and enforcing permits, and imposing and enforcing pretreatment requirements, under sections 307, 402, 318, and 405 of the CWA. The term includes an approved program.

NPDES means National Pollutant Discharge Elimination System.

New HWM facility means a Hazardous Waste Management facility which began operation or for which construction commenced after November 19, 1980.

“Offsite” means any site which is not onsite.

Onsite means on the same or geographically contiguous property which may be divided by public or private right(s) of way, provided the entrance and exit between the properties is at a crossroads intersection, and access is by crossing as opposed to going along, the right(s) of way. Noncontiguous properties owned by the same person but connected by a right of way which the person controls and to which the public does not have access, is also considered onsite property.

Owner or operator means the owner or operator of any facility or activity subject to regulation under RCRA.

“Permit” means an authorization, license, or equivalent control document issued by the Department to implement the requirements of this Part and R.61-79.124. Permit includes permit by rule (270.60), and emergency permit (270.61). Permit does not include interim status (subpart G of this part), or any permit which has not yet been the subject of final agency action, such as a draft permit or a proposed permit.

“Permit-by-rule” means a provision of these regulations stating that a facility or activity is deemed to have a RCRA permit if it meets the requirements of the provision.

Person means an individual, association, partnership, corporation, municipality, State or Federal agency, or an agent or employee thereof.

“Physical construction” means excavation, movement of earth, erection of forms or structures, or similar activity to prepare an HWM facility to accept hazardous waste.

“POTW” means publicly owned treatment works.

“Publicly owned treatment works (POTW)” means any device or system used in the treatment (including recycling and reclamation) of municipal sewage or industrial wastes of a liquid nature which is owned by a State or municipality. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

RCRA means the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act of 1976 (Pub. L. 94-580, as amended by Pub. L. 95-609 and Pub. L. 96-482, 42 U.S.C. 6901 et seq.)

Remedial Action Plan (RAP) means a special form of hazardous waste permit that a facility owner or operator may obtain instead of a permit issued under 270.3 through 270.66, to authorize the treatment, storage or disposal of hazardous remediation waste (as defined in 260.10) at a remediation waste management site.

“Schedule of compliance” means a schedule of remedial measures included in a permit, including an enforceable sequence of interim requirements (for example, actions, operations, or milestone events) leading to compliance with the S.C. Hazardous Waste Management Act and regulations.

“SDWA” means the Safe Drinking Water Act.

“Site” means the land or water area where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

Storage means the holding of hazardous waste for a temporary period, at the end of which the hazardous waste is treated, disposed, or stored elsewhere.

“Transfer facility” means any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of hazardous waste are held during the normal course of transportation.

Transporter means a person engaged in the offsite transportation of hazardous waste by air, rail, highway or water.

Treatment means any method, technique, or process, including neutralization, designed to change the physical, chemical, or biological character or composition of any hazardous waste so as to neutralize such wastes, or so as to recover energy or material resources from the waste, or so as to render such waste nonhazardous, or less hazardous; safer to transport, store, or dispose of; or amenable for recovery, amenable for storage, or reduced in volume.

“UIC” means the Underground Injection Control program.

“Underground injection” means a well injection.

“Underground source of drinking water (USDW)” means an aquifer or its portion:

- (a)(1) Which supplies any public water system; or
- (2) Which contains a sufficient quantity of groundwater to supply a public water system; and
 - (i) Currently supplies drinking water for human consumption; or
 - (ii) Contains fewer than 10,000 mg/l total dissolved solids; and
- (b) Which is not an exempted aquifer.

“USDW” means underground source of drinking water.

“Wastewater treatment unit” means a device which:

- (a) Is part of a wastewater treatment facility which is subject to regulation under either section 402 or 307(b) of the Clean Water Act; and (b) receives and treats or stores an influent wastewater which is a hazardous waste as defined in 261.3, or generates and accumulates a wastewater treatment sludge which is a hazardous waste as defined in 261.3, or treats or stores a wastewater treatment sludge which is a hazardous waste as defined in 261.3; and (c) Meets the definition of tank or tank system in 260.10. (amended 11/90)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.3. Considerations under Federal law.

The following is a list of Federal laws that may apply to the issuance of permits under these rules. When any of these laws is applicable its procedures must be followed. When the applicable law requires consideration or adoption of particular permit conditions or requires the denial of a permit, those requirements also must be followed.

- (a) The Wild and Scenic Rivers Act, 16 U.S.C. 1273 et seq. Section 7 of the Act and the S.C. Scenic Rivers Act of 1974 as amended Section 51-5-10 through 51-5-170 prohibits the Department from

assisting by license or otherwise the construction of any water resources project that would have a direct, adverse effect on the values for which a national wild and scenic river was established.

(b) The National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq. Section 106 of the Act and implementing regulations (36 CFR Part 800) require the Department, before issuing a license, to adopt measures when feasible to mitigate potential adverse effects of the licensed activity and properties listed or eligible for listing in the National Register of Historic Places. The Act's requirements are to be implemented in cooperation with local Historic Preservation Officers and upon notice to, and when appropriate, in consultation with the Advisory Council on Historic Preservation.

(c) The Endangered Species Act, 16 U.S.C. 1531 et seq. Section 7 of the Act and implementing regulations (50 CFR Part 402) and the S.C. Non-game and Endangered Species Act Sections 50-15-10 through 50-15-90 require the Department to ensure, in consultation with the Secretary of the Interior or Commerce, that any action authorized by EPA is not likely to Page 270-6 jeopardize the continued existence of any endangered or threatened species or adversely affect its critical habitat.

(d) The Coastal Zone Management Act, 16 U.S.C. 1451 et seq. Section 307(c) of the Act and implementing regulations (15 CFR Part 930) and the S.C. Coastal Tidelands and Wetlands Act Sections 48-39-10 et seq., prohibit the Department from issuing a permit for an activity affecting land or water use in the coastal zone until the applicant certifies that the proposed activity complies with the S.C. Coastal Council Program and concurs with the certification (or the Secretary of Commerce overrides the State's nonconcurrence).

(e) The Fish and Wildlife Coordination Act, 16 U.S.C. 661 et seq. requires that the Department, before issuing a permit proposing or authorizing the impoundment (with certain exemptions), diversion, or other control or modification of any body of water, consult with the U.S. Fish and Wildlife Department exercising jurisdiction over wildlife resources to conserve those resources.

HISTORY: Added by State Register Volume 11, Issue No. 11, eff November 27, 1987; amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

270.4. Effect of a permit.

(a)(1) Compliance with a permit under these regulations during its term constitutes compliance, for purposes of enforcement, with subtitle C of RCRA and except for those requirements not included in the permit which:

- (i) Become effective by statute;
- (ii) Are promulgated under part 268 of this chapter restricting the placement of hazardous wastes in or on the land; or
- (iii) Are promulgated under 264 regarding leak detection systems for new and replacement surface impoundment, waste pile, and landfill units, and lateral expansions of surface impoundment, waste pile, and landfill units. The leak detection system requirements include double liners, CQA programs, monitoring, action leakage rates, and response action plans, and will be implemented through the procedures of 270.42 Class 1 permit modifications; or
- (iv) Are promulgated under subparts AA, BB, or CC of part 265 of this chapter limiting air emissions.

(2) A permit may be modified, revoked and reissued, or terminated during its term for cause as set forth in 270.41 and 270.43, or the permit may be modified upon the request of the permittee as set forth in 270.42.

(b) The issuance of a permit under these regulations does not convey any property rights of any sort, or any exclusive privilege.

(c) The issuance of a permit does not authorize any injury to persons or property or invasion of other private rights, or any infringement of State or local law or regulations.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; Amended by State Register Volume 36, Issue No. 9, eff September 28, 2012.

270.6. References.

(a) When used in part 270 of this chapter, the following publications are incorporated by reference. These incorporations by reference were approved by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. These materials are incorporated as they exist on the date of approval and a notice of any change in these materials will be published in the Federal Register. Copies may be inspected at the Library, U.S. Environmental Protection Agency, 1200 Pennsylvania Ave., NW., (3403T), Washington, DC 20460, libraryhq@epa.gov; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html.

(b) The following materials are available for purchase from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, (800) 553-6847; or for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 512-1800.

(1) "APTI Course 415: Control of Gaseous Emissions," EPA Publication EPA-450/2-81-005, December 1981, IBR approved for Sec. Sec. 270.24 and 270.25.

(2) [Reserved].

HISTORY: Added by State Register Volume 12, Issue No. 10, eff October 28, 1988. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

SUBPART B ***Permit Application***

270.10. General application requirements.

(a) Permit application. Any person who is required to have a permit under these regulations (including new applicants and permittees with expiring permits) shall complete, sign, and submit an application to the Department as described in this section and Sections 270.70 through 270.73. Persons currently authorized with interim status shall apply for permits when required by the Department. Persons covered by "permits by rule" under Section 270.60 need not apply. Procedures for applications, issuance and administration of emergency permits are found exclusively in Section 270.61. Procedures for application, issuance and administration of research, development, and demonstration permits are found exclusively in Section 270.65.

(b) Who applies? When a facility or activity is owned by one person but is operated by another person, it is the operator's duty to obtain a permit, except that the owner must also sign the permit application.

(c) Completeness. The Department shall not issue a permit before receiving a complete application for a permit except for permits by rule, or emergency permits. An application for a permit is complete when the Department receives an application form and any supplemental information which are completed to the Department's satisfaction. An application for a permit is complete notwithstanding the failure of the owner or operator to submit the exposure information described in paragraph (j) of this section. The Department may deny a permit for the active life of a hazardous waste management facility or unit before receiving a complete application for a permit.

(d) Information requirements.

(1) All applicants for facility permits shall provide information set forth in Section 270.13 and applicable sections in Sections 270.14 through 270.29 to the Department, using the application form provided by the Department.

(2) All applicants for transporter permits shall provide the information as required on the Department's designated application in accordance with the instructions supplied with such form. Evidence of financial responsibility as required by R.61-79.263 must accompany the application.

(e) Existing HWM facilities and interim status qualifications.

(1) Owners and operators of existing hazardous waste management facilities or of hazardous waste management facilities in existence on the effective date of statutory or regulatory amendments under

the South Carolina Hazardous Waste Management Act that render the facility subject to the requirement to have a permit must submit Part A of their permit application no later than:

(i) Six months after the date of publication of regulations which first require them to comply with the standards set forth in R.61-79.265 or R.61-79.266; or

(ii) Thirty days after the date they first become subject to the standards set forth in R.61-79.265 or R.61-79.266 whichever first occurs.

(2) [Reserved]

(3) The Department may by compliance order issued under Section 44-56-140 of the South Carolina Hazardous Waste Management Act extend the date by which the owner and operator of an existing hazardous waste management facility must submit Part A of their permit application.

(4) At any time the owner and operator of an existing HWM facility may be required to submit Part B of their permit application. An owner or operator shall be allowed at least six (6) months from the date of request to submit Part B of the application. Any owner or operator of an existing HWM facility may voluntarily submit Part B of the application at any time. Notwithstanding the above, any owner or operator of an existing HWM facility must submit a Part B permit application in accordance with dates specified in Section 270.73. Any owner or operator of a land disposal facility in existence on the effective date of statutory or regulatory amendments under this Act that render the facility subject to the requirement to have a permit under this regulation must submit a Part B application in accordance with the dates specified in Section 270.73.

(5) Failure to furnish a requested Part B application on time, or to furnish in full the information required by the Part B application, is grounds for termination of interim status under R.61-79.124.

(f) New HWM facilities.

(1) No person shall begin physical construction of a new HWM facility without having submitted Part A and Part B of the permit application and having received a finally effective permit.

(2) An application for a permit for a new HWM facility (including both Part A and Part B) may be filed any time with the Department. All applications must be submitted at least 180 days before physical construction is expected to commence.

(g) Updating permit applications.

(1) If any owner or operator of a HWM facility has filed Part A of a permit application and has not yet filed Part B, the owner or operator shall file an amended Part A application:

(i) With the Department within 180 days after the promulgation of revised regulations under R.61-79.261 listing or identifying additional hazardous waste, if the facility is treating, storing, or disposing of any of those newly listed or identified wastes.

(ii) As necessary to comply with provisions of Section 270.72 for changes during interim status. Revised Part A applications necessary to comply with the provisions of Section 270.72 shall be filed with the Department.

(2) The owner or operator of a facility who fails to comply with the updating requirements of paragraph (g)(1) of this section does not receive interim status as to the wastes not covered by duly filed Part A applications.

(h) Reapplications.

(1) Any HWM facility with an effective permit shall submit a new application at least 180 days before the expiration date of the effective permit, unless permission for a later date has been granted by the Department. The Department shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

(2) Any transporter with an effective permit shall submit a new application at least 90 days before the expiration date of the effective permit, unless permission for a later date has been granted by the Department.

(i) Recordkeeping. Applicants shall keep records of all data used to complete permit applications and any supplemental information submitted under Sections 270.10(d), 270.13, 270.14 through 270.21 for a period of at least 3 years from the date the application is signed.

(j) Exposure information.

(1) After August 8, 1985, any Part B permit application submitted by an owner or operator of a facility that stores, treats, or disposes of hazardous waste in a surface impoundment or a landfill must be accompanied by information, reasonably ascertainable by the owner or operator, on the potential for the public to be exposed to hazardous wastes or hazardous constituents through releases related to the unit. At a minimum, such information must address:

- (i) Reasonably foreseeable potential releases from both normal operations and accidents at the unit, including releases associated with transportation to or from the unit;
- (ii) The potential pathways of human exposure to hazardous wastes or constituents resulting from the releases described under paragraph (j)(1)(i) of this section;; and
- (iii) The potential magnitude and nature of the human exposure resulting from such releases.

(2) By August 8, 1985, owners and operators of a landfill or a surface impoundment who have already submitted a Part B application must submit the exposure information required in paragraph (j)(1) of this section.

(k) The Department may require a permittee or an applicant to submit information in order to establish permit conditions under 270.32(b)(2). (amended 11/90, 12/92)

(l) If the Department concludes, based on one or more of the factors listed in paragraph (l)(1) of this section that compliance with the standards of 40 CFR part 63, subpart EEE alone may not be protective of human health or the environment, the Department shall require the additional information or assessment(s) necessary to determine whether additional controls are necessary to ensure protection of human health and the environment. This includes information necessary to evaluate the potential risk to human health and/or the environment resulting from both direct and indirect exposure pathways. The Department may also require a permittee or applicant to provide information necessary to determine whether such an assessment(s) should be required.

(1) The Department shall base the evaluation of whether compliance with the standards of 40 CFR part 63, subpart EEE alone is protective of human health or the environment on factors relevant to the potential risk from a hazardous waste combustion unit, including, as appropriate, any of the following factors:

- (i) Particular site-specific considerations such as proximity to receptors (such as schools, hospitals, nursing homes, day care centers, parks, community activity centers, or other potentially sensitive receptors), unique dispersion patterns, etc.;
- (ii) Identities and quantities of emissions of persistent, bioaccumulative or toxic pollutants considering enforceable controls in place to limit those pollutants;
- (iii) Identities and quantities of nondioxin products of incomplete combustion most likely to be emitted and to pose significant risk based on known toxicities (confirmation of which should be made through emissions testing);
- (iv) Identities and quantities of other off-site sources of pollutants in proximity of the facility that significantly influence interpretation of a facility-specific risk assessment;
- (v) Presence of significant ecological considerations, such as the proximity of a particularly sensitive ecological area;
- (vi) Volume and types of wastes, for example wastes containing highly toxic constituents;
- (vii) Other on-site sources of hazardous air pollutants that significantly influence interpretation of the risk posed by the operation of the source in question;
- (viii) Adequacy of any previously conducted risk assessment, given any subsequent changes in conditions likely to affect risk; and
- (ix) Such other factors as may be appropriate.

(2) [Reserved]

(m) A copy of a site specific inspection checklist shall be prepared by the applicant. The checklist shall be approved by the Department for use by the Department in conducting compliance inspections and shall include all applicable requirements of 261 through 270. An amended checklist shall be

submitted to the Department for approval each time a permit modification is requested. The amended checklist shall accompany the permit modification request.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 34, Issue No. 5, eff May 28, 2010.

270.11. Signatories to permit applications and reports under these regulations.

(a) Applications. All permit applications shall be signed as follows:

(1) For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means (i) a president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions for the corporation, or (ii) the manager of one or more manufacturing, production or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding 25 million dollars (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

Note: The Department does not require specific assignments or delegations of authority to responsible corporate officers identified in 270.11(a)(1)(i). The Department will presume that these responsible corporate officers have the requisite authority to sign permit applications unless the corporation has notified the Department to the contrary. Corporate procedures governing authority to sign permit applications may provide for assignment or delegation to applicable corporate positions under 270.11(a)(1)(ii) rather than to specific individuals.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a municipality, State, Federal or other public agency: by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operation of a principal geographic unit of the agency.

(b) Reports. All reports required by permits and other information requested by the Department, shall be signed by a person described in paragraph (a) of this section, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described in paragraph (a) of this section;

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The written authorization is submitted to the Department.

(c) Changes to authorization. If an authorization under paragraph (b) of this section is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of paragraph (b) of this section must be submitted to the Department prior to or together with any reports, information, or applications to be signed by an authorized representative.

(d)(1) Certification. Any person signing a document under paragraphs (a) or (b) of this section shall make the following certification:

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I

am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

(2) For remedial action plans (RAPs) under subpart H of this part, if the operator certifies according to paragraph (d)(1) of this section, then the owner may choose to make the following certification instead of the certification in paragraph (d) (1) of this section:

“Based on my knowledge of the conditions of the property described in the RAP and my inquiry of the person or persons who manage the system referenced in the operator’s certification, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.12. Confidentiality of information.

(a) In accordance with the Hazardous Waste Management Act Section 44-56-80 and the Freedom of Information Act Section 30-4-40 certain information submitted to the Department pursuant to these regulations may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words “confidential business information” on each page containing such information. If no claim is made at the time of submission, the Department may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in South Carolina 30-4-10 et seq. and 40 CFR Part 2 (Public Information); and

(b) Claims of confidentiality for the name and address of any permit applicant or permittee will be denied.

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992.

270.13. Contents of Part A of the permit application.

Part A of the application shall include the following information:

- (a) The activities conducted by the applicant which require it to obtain a permit.
- (b) Name, mailing address, and location, including latitude and longitude of the facility for which the application is submitted.
- (c) Up to four SIC codes which best reflect the principal products or service provided by the facility.
- (d) The operator’s name, address, telephone number, ownership status, and status as Federal, State, private, public, or other entity.
- (e) The name, address, and phone number of the owner of the facility.
- (f) Whether the facility is located on Indian lands.
- (g) An indication of whether the facility is new or existing and whether it is a first or revised application.
- (h) For existing facilities,
 - (1) A scale drawing of the facility showing the location of all past, present, and future treatment, storage, and disposal areas; and
 - (2) Photographs of the facility clearly delineating all existing structures; existing treatment, storage, and disposal areas; and sites of future treatment, storage, and disposal areas.
- (i) A description of the processes to be used for treating, storing, and disposing of hazardous waste, and the design capacity of these items.
- (j) A specification of the hazardous wastes listed or designated under R.61-79.261 to be treated, stored, or disposed of at the facility, an estimate of the quantity of such wastes to be treated, stored, or disposed of annually, and a general description of the processes to be used for such wastes. (amend
- (k) A listing of all permits or construction approvals received or applied for under any of the following programs:

- (1) Hazardous Waste Management program.
 - (2) UIC program under the SWDA.
 - (3) NPDES program under the CWA.
 - (4) Prevention of Significant Deterioration (PSD) program under the Clean Air Act.
 - (5) Nonattainment program under the Clean Air Act.
 - (6) National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.
 - (7) Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.
 - (8) Dredge or fill permits under Section 404 of the CWA.
 - (9) Other relevant environmental permits, including State permits.
- (l) A topographic map (or other map of similar scale if a topographic map is unavailable) extending one mile beyond the property boundaries of the source, depicting the facility and each of its intake and discharge structures; each of its hazardous waste treatment, storage, or disposal facilities; each well where fluids from the facility are injected underground; and those wells, springs, other surface water bodies, and drinking water wells listed in public records or otherwise known to the applicant within ¼ mile of the facility property boundary.
- (m) A brief description of the nature of the business.
- (n) For hazardous debris, a description of the debris category(ies) and contaminant category(ies) to be treated, stored, or disposed of at the facility.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

270.14. Contents of Part B: General Requirements.

(a) Part B of the permit application consists of the general information requirements of this section, and the specific information requirements in sections 270.14 through 270.29 applicable to the facility. The part B information requirements presented in sections 270.14 through 270.29 reflect the standards promulgated in R.61-79.264. These information requirements are necessary in order for the Department to determine compliance with the R.61-79.264 standards. If owners and operators of HWM facilities can demonstrate that the information prescribed in part B cannot be provided to the extent required, the Department may make allowance for submission of such information on a case-by-case basis. Information required in part B shall be submitted to the Department and signed in accordance with the requirements in section 270.11. Certain technical data, such as design drawings and specifications, and engineering studies shall be certified by a qualified Professional Engineer. For post-closure permits, only the information specified in section 270.28 is required in part B of the permit application.

(b) General information requirements. The following information is required for all HWM facilities, except as R.61-79.264.1 provides otherwise:

- (1) A general description of the facility.
- (2) Chemical and physical analyses of the hazardous waste and hazardous debris to be handled at the facility. At a minimum, these analyses shall contain all the information which must be known to treat, store, or dispose of the wastes properly in accordance with R.61-79.264.
- (3) A copy of the waste analysis plan required by Section 264.13(b) and, if applicable, Section 264.13(c).
- (4) A description of the security procedures and equipment required by R.61-79.264.14, or a justification demonstrating the reasons for requesting a waiver of this requirement.
- (5) A copy of the general inspection schedule required by 264.15(b) Include where applicable, as part of the inspection schedule, specific requirements in 264.174, 245.193(i), 264.195, 264.226, 264.254, 264.273, 264.303, 264.602, 264.1033, 264.1052,264.1053, 264.1058, 264.1084, 264.1085, 264.1086,and 264.1088.
- (6) A justification of any request for waiver(s) of the preparedness and prevention requirements of R.61-79.264 Subpart C.

(7) A copy of the contingency plan required by part 264, subpart D. Note: Include, where applicable, as part of the contingency plan, specific requirements in 264.227, 264.255, and 264.200.

(8) A description of procedures, structures, or equipment used at the facility to:

- (i) Prevent hazard in unloading operations (for example, ramps, special forklifts);
- (ii) Prevent runoff from hazardous waste handling areas to the areas of the facility or environment, or to prevent flooding (for example, berms, dikes, trenches);
- (iii) Prevent contamination of water supplies;
- (iv) Mitigate effects of equipment failure and power outages; and
- (v) Prevent undue exposure of personnel to hazardous waste (for example, protective clothing).
- (vi) Prevent releases to atmosphere.

(9) A description of precautions to prevent accidental ignition or reaction of ignitable, reactive, or incompatible wastes as required to demonstrate compliance with R.61-79.264.17 including documentation demonstrating compliance with R.61-79.264.17(c).

(10) Traffic pattern, estimated volume (number, types of vehicles) and control [for example, show turns across traffic lanes, and stacking lanes (if appropriate); describe access road surfacing and load bearing capacity; show traffic control signals].

(11) Facility location information:

(i) In order to determine the applicability of the seismic standard [R.61-79.264.18(a)] the owner or operator of a new facility must identify the political jurisdiction (e.g., county, township, or election district) in which the facility is proposed to be located. If the county or election district is not listed in Appendix VI of R.61-79.264, no further information is required to demonstrate compliance with R.61-79.264.18(a).

(ii) If the facility is proposed to be located in an area listed in Appendix VI of R.61-79.264, the owner or operator shall demonstrate compliance with the seismic standard. This demonstration may be made using either published geologic data or data obtained from field investigations carried out by the applicant. The information provided must be of such quality to be acceptable to geologists experienced in identifying and evaluating seismic activity. The information submitted must show that either:

(A) No faults which have had displacement in Holocene time are present, or no lineations which suggest the presence of a fault (which have displacement in Holocene time) within 3,000 feet of a facility are present, based on data from:

- (1) Published geologic studies.
- (2) Aerial reconnaissance of the area within a five-mile radius from the facility,
- (3) An analysis of aerial photographs covering a 3,000 foot radius of the facility, and
- (4) if needed to clarify the above data, a reconnaissance based on walking portions of the area within 3,000 feet of the facility, or

(B) If faults (to include lineations) which have had displacement in Holocene time are present within 3,000 feet of a facility, no faults pass within 200 feet of the portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted, based on data from a comprehensive geologic analysis of the site. Unless a site analysis is otherwise conclusive concerning the absence of faults within 200 feet of such portions of the facility data shall be obtained from a subsurface exploration (trenching) of the area within a distance no less than 200 feet from portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted. Such trenching shall be performed in a direction that is perpendicular to known faults (which have had displacement in Holocene time) passing within 3,000 feet of the portions of the facility where treatment, storage, or disposal of hazardous waste will be conducted. Such investigation shall document with support maps and other analyses, the location of any faults found.

Comment: The federal Guidance Manual for the Location Standards provides greater detail on the content of each type of seismic investigation and the appropriate conditions under which each approach or a combination of approaches would be used.

(iii) Owners and operators of all facilities shall provide an identification of whether the facility is located within a 100-year floodplain. This identification must indicate the source of data for such determination and include a copy of the relevant Federal Insurance Administration (FIA) flood map, if used, or the calculations and maps used where a FIA map is not available. Information shall also be provided identifying the 100-year flood level and any other special flooding factors (e.g., wave action) which must be considered in designing, constructing, operating, or maintaining the facility to withstand washout from a 100-year flood.

Comment: Where maps for the National Flood Insurance Program produced by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency are available, they will normally be determinative of whether a facility is located within or outside of the 100-year floodplain. However, where the FIA map excludes an area (usually areas of the flood plain less than 200 feet in width), these areas must be considered and a determination made as to whether they are in the 100-year floodplain. Where FIA maps are not available for a proposed facility location, the owner or operator must use equivalent mapping techniques to determine whether the facility is within the 100-year floodplain, and if so located, what the 100-year flood elevation would be.

(iv) Owners and operators of facilities located in the 100-year floodplain must provide the following information:

(A) Engineering analysis to indicate the various hydrodynamic and hydrostatic forces expected to result at the site as a consequence of a 100-year flood.

(B) Structural or other engineering studies showing the design of operational units (e.g., tanks, incinerators) and flood protection devices (e.g., floodwalls, dikes) at the facility and how these will prevent washout.

(C) If applicable, and in lieu of paragraphs (b)(11)(iv)(A) and (B), a detailed description of procedures to be followed to remove hazardous waste to safety before the facility is flooded, including:

(1) Timing of such movement relative to flood levels, including estimated time to move the waste, to show that such movement can be completed before floodwaters reach the facility,

(2) A description of the location(s) to which the waste will be moved and demonstration that those facilities will be eligible to receive hazardous waste in accordance with the regulations under R.61-79.270, R.61-79.124, and R.61-79.264 through R.61-79.266.

(3) The planned procedures, equipment, and personnel to be used and the means to ensure that such resources will be available in time for use.

(4) The potential for accidental discharges of the waste during movement.

(v) Existing facilities not in compliance with R.61-79.264.18(b) shall provide a plan showing how the facility will be brought into compliance and a schedule for compliance.

(12) An outline of both the introductory and continuing training programs by owners or operators to prepare persons to operate or maintain the HWM facility in a safe manner as required to demonstrate compliance with R.61-79.264.16. A brief description of how training will be designed to meet actual job tasks in accordance with requirements in R.61-79.264.16(a)(3).

(13) A copy of the closure plan and, where applicable, the post-closure plan required by R.61-79.264.112, 264.118 and 264.197. Include where applicable, as part of the plans, specific requirements in R.61-79.264.178, 264.197, 264.228, 264.258, 264.280, 264.310, 264.351, 264.601 and 264.603.

(14) For hazardous waste disposal units that have been closed, documentation that notices required under R.61-79.264.119 have been filed.

(15) The most recent closure cost estimate for the facility prepared in accordance with R.61-79.264.142 and a copy of the documentation required to demonstrate financial assurance under R.61-79.264.143. For a new facility, a copy of the required documentation may be submitted 60 days prior to the initial receipt of hazardous wastes, if that is later than the submission of the Part B.

(16) Where applicable, the most recent post-closure cost estimate for the facility prepared in accordance with R.61-79.264.144 plus a copy of the documentation required to demonstrate

financial assurance under R.61-79.264.145. For a new facility, a copy of the required documentation may be submitted 60 days prior to the initial receipt of hazardous wastes, if that is later than the submission of the Part B.

(17) Where applicable, a copy of the insurance policy or other documentation which comprises compliance with the requirements of R.61-79.264.147. For a new facility, documentation showing the amount of insurance meeting the specification of R.61-79.264.147(a) and, if applicable, R.61-79.264.147(b), that the owner or operator plans to have in effect before initial receipt of hazardous waste for treatment, storage, or disposal. A request for a variance in the amount of required coverage, for a new or existing facility, may be submitted as specified in R.61-79.264.147(c).

(18) Where appropriate, proof of coverage by a state financial mechanism in compliance with R.61-79.264.149 or 264.150. (amended 11/90)

(19) A topographic map showing a distance of 1000 feet around the facility at a scale of 2.5 centimeters (1 inch) equal to not more than 61.0 meters (200 feet). Contours must be shown on the map. The contour interval must be sufficient to clearly show the pattern of surface water flow in the vicinity of and from each operational unit of the facility. For example, contours with an interval of 1.5 meters (5 feet), if relief is greater than 6.1 meters (20 feet), or an interval of 0.6 meters (2 feet), if relief is less than 6.1 meters (20 feet). Owners and operators of Hazardous Waste Management facilities located in mountainous areas should use large contour intervals to adequately show topographic profiles of facilities. The map shall clearly show the following: (amended 11/90)

- (i) Map scale and date.
- (ii) 100-year floodplain area.
- (iii) Surface waters including intermittent streams.
- (iv) Surrounding land uses (residential, commercial, agricultural, recreational).
- (v) A wind rose (i.e., prevailing windspeed and direction).
- (vi) Orientation of the map (north arrow).
- (vii) Legal boundaries of the facility site.
- (viii) Access control (fences, gates).
- (ix) Injection and withdrawal wells both onsite and offsite.
- (x) Buildings; treatment, storage, or disposal operations; or other structures (recreational areas, runoff control systems, access and internal roads, storm, sanitary, and process sewerage systems, loading and unloading areas, fire control facilities, etc.)
- (xi) Barriers for drainage or flood control.
- (xii) Location of operational units within the HWM facility site, where hazardous waste is (or will be) treated, stored, or disposed (include equipment cleanup areas).

Note: For large HWM facilities the Department will allow the use of other scales on a case-by-case basis.

(20) Applicants may be required to submit such information as may be necessary to enable the Department to carry out its duties under other State or Federal laws as required in 270.3 of this part. (amended 6/89)

(21) For land disposal facilities, if a case-by-case extension has been approved under 268.5 or a petition has been approved under 268.6, a copy of the notice of approval for the extension or petition is required.(amended 11/90)

(22) A summary of the pre-application meeting, along with a list of attendees and their addresses, and copies of any written comments or materials submitted at the meeting, as required under 124.31(c).

(23) A complete corporate description such as a Security and Exchange Commission Annual Report, or its equivalent. (amended 6/89)

(c) Additional information requirements. The following additional information regarding protection of groundwater is required from owners or operators of hazardous waste facilities containing a regulated unit except as provided by 264.90(b).

(1) A summary of the groundwater monitoring data obtained during the interim status period under Sections R.61-79.265.90 through 265.94, where applicable.

(2) Identification of the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property, including groundwater flow direction and rate, and the basis for such identification (i.e., the information obtained from hydrogeologic investigations of the facility area).

(3) On the topographic map required under paragraph (b)(19) of this section, a delineation of the waste management area, the property boundary, the proposed "point of compliance" as defined under R.61-79.264.95, the proposed location of groundwater monitoring wells as required under R.61-79.264.97 and to the extent possible, the information required in paragraph (c)(2) of this section;

(4) A description of any plume of contamination that has entered the groundwater from a regulated unit at the time that the application is submitted that:

(i) Delineates the extent of the plume on the topographic map required under paragraph (b)(19) of this section;

(ii) Identifies the concentration of each Appendix IX constituent of Part 264 throughout the plume or identifies the maximum concentrations of each Appendix IX constituent in the plume. (amended 11/90)

(5) Detailed plans and an engineering report describing the proposed groundwater monitoring program to be implemented to meet the requirements of R.61-79.264.97;

(6) If the presence of hazardous constituents has not been detected in the groundwater at the time of permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a detection monitoring program which meets the requirements of R.61-79.264.98. This submission must address the following items as specified under R.61-79.264.98:

(i) A proposed list of indicator parameters, waste constituents, or reaction products that can provide a reliable indication of the presence of hazardous constituents in the groundwater;

(ii) A proposed groundwater monitoring system;

(iii) Background values for each proposed monitoring parameter or constituent, or procedures to calculate such values; and

(iv) A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating groundwater monitoring data.

(7) If the presence of hazardous constituents has been detected in the groundwater at the point of compliance at the time of the permit application, the owner or operator must submit sufficient information, supporting data, and analyses to establish a compliance monitoring program which meets the requirements of R.61-79.264.99. Except as provided in R.61-79.264.98(g)(5), the owner or operator must also submit an engineering feasibility plan for a corrective action program necessary to meet the requirements of R.61-79.264.100, unless the owner or operator obtains written authorization in advance from the Department to submit a proposed permit schedule for submittal of such a plan. To demonstrate compliance with R.61-79.264.99, the owner or operator must address the following items:

(i) A description of the wastes previously handled at the facility;

(ii) A characterization of the contaminated groundwater, including concentrations of hazardous constituents;

(iii) A list of hazardous constituents for which compliance monitoring will be undertaken in accordance with R.61-79.264 and 264.99;

(iv) Proposed concentration limits for each hazardous constituent, based on the criteria set forth in R.61-79.264.94(a), including a justification for establishing any alternate concentration limits;

(v) Detailed plans and an engineering report describing the proposed groundwater monitoring system, in accordance with the requirements of R.61-79.264.97; and

(vi) A description of proposed sampling, analysis and statistical comparison procedures to be utilized in evaluating groundwater monitoring data.

(8) If hazardous constituents have been measured in the groundwater which exceed the concentration limits established under R.61-79.264.94 Table 1 or if groundwater monitoring conducted at the time of permit application under R.61-79.265.90 through 265.94 at the waste boundary indicates the presence of hazardous constituents from the facility in groundwater over background concentrations, the owner or operator must submit sufficient information, supporting data, and analyses to establish a corrective action program which meets the requirements of R.61-79.264.100. However, an owner or operator is not required to submit information to establish a corrective action program if he demonstrates to the Department that alternate concentration limits will protect human health and the environment after considering the criteria listed in R.61-79.264.94(b). An owner or operator who is not required to establish a corrective action program for this reason must instead submit sufficient information to establish a compliance monitoring program which meets the requirements of R.61-79.264.99 and paragraph (c)(6) of this section. To demonstrate compliance with R.61-79.264.100, the owner or operator must address, at a minimum, the following items:

- (i) A characterization of the contaminated groundwater, including concentrations of hazardous constituents;
- (ii) The concentration limit for each hazardous constituent found in the groundwater as set forth in R.61-79.264.94;
- (iii) Detailed plans and an engineering report describing the corrective action to be taken; and
- (iv) A description of how the groundwater monitoring program will demonstrate the adequacy of the corrective action.
- (v) The permit may contain a schedule for submittal of the information required in paragraphs (c)(8)(iii) and (iv) provided the owner or operator obtains written authorization from the Department prior to submittal of the complete permit application.

(d) Information requirements for solid waste management units.

(1) The following information is required for each solid waste management unit at a facility seeking a permit.

- (i) The location of the unit on the topographic map required under paragraph (b)(19) of this section.
- (ii) Designation of type of unit.
- (iii) General dimensions and structural description (supply any available drawings).
- (iv) When the unit was operated.
- (v) Specification of all wastes that have been managed at the unit, to the extent available.

(2) The owner or operator of any facility containing one or more solid waste management units must submit all available information pertaining to any release of hazardous wastes or hazardous constituents from such unit or units.

(3) The owner/operator must conduct and provide the results of sampling and analysis of groundwater, landsurface, and subsurface strata, surface water, or air, which may include the installation of wells, where the Department ascertains it is necessary to complete a RCRA Facility Assessment that will determine if a more complete investigation is necessary.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 13, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 44-6 Doc. No. 4883, eff June 26, 2020; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.15. Specific Part B information requirements for containers.

Except as otherwise provided in R.61-79.264.170, owners or operators of facilities that store containers of hazardous waste must provide the following additional information: (revised 12/92)

(a) A description of the containment system to demonstrate compliance with R.61-79.264.175. Show at least the following:

- (1) Basic design parameters, dimensions, and materials of construction.
- (2) How the design promotes drainage or how containers are kept from contact with standing liquids in the containment system.
- (3) Capacity of the containment system relative to the number and volume of containers to be stored.
- (4) Provisions for preventing or managing run-on.
- (5) How accumulated liquids can be analyzed and removed to prevent overflow.

(b) For storage areas that store containers holding wastes that do not contain free liquids, a demonstration of compliance with R.61-79.264.175(c), including:

- (1) Test procedures and results or other documentation or information to show that the wastes do not contain free liquids; and
- (2) A description of how the storage area is designed or operated to drain and remove liquids or how containers are kept from contact with standing liquids.

(c) Sketches, drawings, or data demonstrating compliance with R.61-79.264.176 (location of buffer zone and containers holding ignitable or reactive wastes) and R.61-79.264.177(c) (location of incompatible wastes), where applicable,

(d) Where incompatible wastes are stored or otherwise managed in containers, a description of the procedures used to ensure compliance with R.61-79.264.177(a) and (b), and R.61-79.264.17 (b) and (c).

(e) Information on air emission control equipment as required in 270.27.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

270.16. Specific Part B information requirements for tank systems.

Except as otherwise provided in R.61-79.264.190, owners and operators of facilities that use tanks to store or treat hazardous waste must provide the following additional information.

(a) A written assessment that is reviewed and certified by a qualified Professional Engineer as to the structural integrity and suitability for handling hazardous waste of each tank system, as required under 264.191 and 264.192;

(b) Dimensions and capacity of each tank;

(c) Description of feed systems, safety cutoff, bypass systems, and pressure controls (e.g., vents);

(d) A diagram of piping, instrumentation, and process flow for each tank system;

(e) A description of materials and equipment used to provide external corrosion protection, as required under 264.192(a)(3)(ii).

(f) For new tank systems, a detailed description of how the tank system(s) will be installed in compliance with R.61-79.264.192(b), (c), (d), and (e);

(g) Detailed plans and descriptions of how the secondary containment system for each tank system is or will be designed, constructed, and operated to meet the requirements of 264.193(a), (b), (c), (d), (e), and (f);

(h) For tank systems for which a variance from the requirements of R.61-79.264.193 is sought (as provided by Section 264.193(g)):

(1) Detailed plans and engineering and hydrogeologic reports, as appropriate, describing alternate design and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous waste or hazardous constituents into the groundwater or surface water during the life of the facility, or

(2) A detailed assessment of the substantial present or potential hazards posed to human health or the environment should a release enter the environment.

(i) Description of controls and practices to prevent spills and overflows, as required under R.61-79.264.194(b); and

(j) For tank systems in which ignitable, reactive, or incompatible wastes are to be stored or treated, a description of how operating procedures and tank system and facility design will achieve compliance with the requirements of R.61-79.264.198 and 264.199.

(k) Information on air emission control equipment as required in 270.27.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 32, Issue No. 6, eff June 27, 2008.

270.17. Specific Part B information requirements for surface impoundments.

Except as otherwise provided in R.61-79.264.1, owners and operators of facilities that store, treat or dispose of hazardous waste in surface impoundments must provide the following additional information:

(a) A list of the hazardous wastes placed or to be placed in each surface impoundment;

(b) Detailed plans and an engineering report describing how the surface impoundment is designed and is or will be designed, constructed, operated, and maintained to meet the requirements of R.61-79.264.19, 264.221, 264.222, and 264.223, addressing following items:

(1) The liner system (except for an existing portion of a surface impoundment). If an exemption from the requirement for a liner is sought as provided by R.61-79.264.221(b), submit detailed plans and engineering and hydrogeologic reports as appropriate, describing alternate design and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous constituents into the groundwater or surface water at any future time;

(2) The double liner and leak (leachate) detection, collection, and removal system, if the surface impoundment must meet the requirements of section 264.221(c) of this chapter. If an exemption from the requirements for double liners and a leak detection, collection, and removal system or alternative design is sought as provided by section 264.221(d), (e), or (f) of this chapter, submit appropriate information;

(3) If the leak detection system is located in a saturated zone, submit detailed plans and an engineering report explaining the leak detection system design and operation, and the location of the saturated zone in relation to the leak detection system;

(4) The construction quality assurance (CQA) plan if required under section 264.19 of this chapter;

(5) Proposed action leakage rate, with rationale, if required under 264.222 of this chapter, and response action plan, if required under section 264.223 of this chapter;

(6) Prevention of overtopping; and

(7) Structural integrity of dikes;

(c) A description of how each surface impoundment, including the double liner system, leak detection system, cover system and appurtenances for control of overtopping, will be inspected in order to meet the requirements of 264.226(a), (b), and (d). This information must be included in the inspection plan submitted under Section 270.14(b)(5);

(d) A certification by a qualified engineer which attests to the structural integrity of each dike, as required under 264.226(c). For new units, the owner or operator must submit a statement by a qualified engineer that he will provide such a certification upon completion of construction in accordance with the plans and specifications;

(e) A description of the procedure to be used for removing a surface impoundment from service, as required under R.61-79.264.227 (b) and (c). This information should be included in the contingency plan submitted under Section 270.14(b)(7).

(f) A description of how hazardous waste residues and contaminated materials will be removed from the unit at closure, as required under R.61-79.264.228(a)(1). For any wastes not to be removed from the unit upon closure, the owner or operator must submit detailed plans and an engineering report

describing how 264.228(a)(2) and (b) will be complied with. This information should be included in the closure plan and, where applicable, the postclosure plan submitted under Section 270.14(b)(13).

(g) If ignitable or reactive wastes are to be placed in a surface impoundment, an explanation of how R.61-79.264.229 will be complied with.

(h) If incompatible wastes, or incompatible wastes and materials will be placed in a surface impoundment, an explanation of how R.61-79.264.230 will be complied with.

(i) A waste management plan for Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how the surface impoundment is or will be designed, constructed, operated, and maintained to meet the requirements of R.61-79.264.231. This submission must address the following items as specified in this Section 264.231:

(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.

(j) Information on air emission control equipment as required in 270.27.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

270.18. Specific Part B information requirements for waste piles.

Except as otherwise provided in R.61-79.264.1, owners and operators of facilities that store or treat hazardous waste in waste piles must provide the following additional information:

(a) A list of hazardous wastes placed or to be placed in each waste pile;

(b) If an exemption is sought to R.61-79.264.251 and subpart F of part 264 as provided by R.61-79.264.250(c) or R.61-79.264.90(b)(2), an explanation of how the standards of R.61-79.264.250(c) will be complied with or detailed plans and an engineering report describing how the requirements of section 264.90(b)(2) will be met.

(c) Detailed plans and an engineering report describing how the waste pile is designed and is or will be constructed, operated, and maintained to meet the requirements of R.61-79.264.19, 264.251, 264.252, and 264.253, addressing the following items:

(1)(i) The liner system (except for an existing portion of a waste pile), if the waste pile must meet the requirements of 264.251(a). If an exemption from the requirement for a liner is sought as provided by R.61-79.264.251(b), the owner or operator must submit detailed plans, and engineering and hydrogeological reports, as appropriate, describing alternate designs and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous constituents into the groundwater or surface water at any future time;

(ii) The double liner and leak (leachate) detection, collection, and removal system, if the waste pile must meet the requirements of section 264.251(c). If an exemption from the requirements for double liners and a leak detection, collection, and removal system or alternative design is sought as provided by section 264.251(d), (e), or (f), submit appropriate information;

(iii) If the leak detection system is located in a saturated zone, submit detailed plans and an engineering report explaining the leak detection system design and operation, and the location of the saturated zone in relation to the leak detection system;

(iv) The construction quality assurance (CQA) plan if required under section 264.19;

(v) Proposed action leakage rate, with rationale, if required under section 264.252, and response action plan, if required under section 264.253;

(2) Control of run-on;

(3) Control of run-off;

(4) Management of collection and holding units associated with run-on and run-off control systems; and

(5) Control of wind dispersal of particulate matter, where applicable;

(d) A description of how each waste pile, including the double liner system, leachate collection and removal system, leak detection system, cover system, and appurtenances for control of run-on and run-off, will be inspected in order to meet the requirements of R.61-79.264.254(a), (b), and (c). This information must be included in the inspection plan submitted under section 270.14(b)(5);

(e) If treatment is carried out on or in the pile, details of the process and equipment used, and the nature and quality of the residuals;

(f) If ignitable or reactive wastes are to be placed in a waste pile, an explanation of how the requirements of R.61-79.264.256 will be complied with;

(g) If incompatible wastes or incompatible wastes and materials will be placed in a waste pile, an explanation of how R.61-79.264.257 will be complied with;

(h) A description of how hazardous waste residues and contaminated materials will be removed from the waste pile at closure, as required under R.61-79.264.258(a). For any waste not to be removed from the waste pile upon closure, the owner or operator must submit detailed plans and an engineering report describing how R.61-79.264.310 (a) and (b) will be complied with. This information should be included in the closure plan and, where applicable, the postclosure plan submitted under section 270.14(b)(13). (revised 11/90, 12/92)

(i) A waste management plan for Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how a waste pile that is not enclosed (as defined in R.61-79.264.250 (c)) is or will be designed, constructed, operated, and maintained to meet the requirements of R.61-79.264.259. This submission must address the following items as specified in this Section 264.259:

(1) The volume, physical, and chemical characteristics of the wastes to be disposed in the waste pile, 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.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

270.19. Specific Part B information requirements for incinerators.

Except as 264.340 and 270.19(e) provide otherwise, owners and operators of facilities that incinerate hazardous waste must fulfill the requirements of (a), (b), or (c).

(a) When seeking exemption under R.61-79.264.340 (b) or (c) (ignitable, corrosive or reactive wastes only);

(1) Documentation that the waste is listed as a hazardous waste in R.61-79.261 subpart D solely because it is ignitable (Hazard Code I) or corrosive (Hazard Code C) or both; (revised 5/96) or

(2) Documentation that the waste is listed as a hazardous waste in R.61-79.261 Subpart D 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

(3) Documentation that the waste is a hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the tests for characteristics of hazardous wastes under R.61-79.261 Subpart C; or

(4) Documentation that the waste is a hazardous waste solely because it possesses the reactivity characteristics listed in R.61-79.261.23(a)(1), (2), (3), (6), (7) or (8), and that it will not be burned when other hazardous wastes are present in the combustion zone; or

(b) Submit a trial burn plan or the results of a trial burn, including all required determinations, in accordance with Section 270.62; or

(c) In lieu of a trial burn, the applicant may submit the following information:

- (1) An analysis of each waste or mixture of wastes to be burned including:
 - (i) Heat value of the waste in the form and composition in which it will be burned;
 - (ii) Viscosity (if applicable), or description of physical form of the waste;
 - (iii) An identification of any hazardous organic constituents listed in R.61-79.261, appendix VIII, which are present in the waste to be burned, except that the applicant need not analyze for constituents listed in R.61-79.261, appendix VIII, which would reasonably not be expected to be found in the waste. The constituents excluded from analysis must be identified and the basis for their exclusion stated. The waste analysis must rely on analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in R.61-79.260.11 and § 270.6, or other equivalent.
 - (iv) An approximate quantification of the hazardous constituents identified in the waste, within the precision produced by the analytical methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in R.61-79.260.11 and § 270.6. (revised 12/92)
 - (v) A quantification of those hazardous constituents in the waste which may be designated as POHC's based on data submitted from other trial or operational burns which demonstrate compliance with the performance standard in R.61-79.264.343.
- (2) A detailed engineering description of the incinerator, including:
 - (i) Manufacturer's name and model number of incinerator.
 - (ii) Type of incinerator.
 - (iii) Linear dimension of incinerator unit including cross sectional area of combustion chamber.
 - (iv) Description of auxiliary fuel system (type/feed).
 - (v) Capacity of prime mover.
 - (vi) Description of automatic waste feed cutoff system(s).
 - (vii) Stack gas monitoring and pollution control monitoring system.
 - (viii) Nozzle and burner design.
 - (ix) Construction materials.
 - (x) Location and description of temperature, pressure, and flow indicating devices and control devices.
- (3) A description and analysis of the waste to be burned compared with the waste for which data from operational or trial burns are provided to support the contention that a trial burn is not needed. The data should include those items listed in Paragraph (c)(1) of this section. This analysis should specify the POHC's which the applicant has identified in the waste for which a permit is sought, and any differences from the POHC's in the waste for which burn data are provided.
- (4) The design and operating conditions of the incinerator unit to be used, compared with that for which comparative burn data are available.
- (5) A description of the results submitted from any previously conducted trial burn(s) including:
 - (i) Sampling and analysis techniques used to calculate performance standards in R.61-79.264.343.
 - (ii) Methods and results of monitoring temperatures, waste feed rates, carbon monoxide, and an appropriate indicator of combustion gas velocity (including a statement concerning the precision and accuracy of this measurement),
- (6) The expected incinerator operation information to demonstrate compliance with R.61-79.264.343 and 264.345 including:
 - (i) Expected carbon monoxide (CO) level in the stack exhaust gas.
 - (ii) Waste feed rate.
 - (iii) Combustion zone temperature.
 - (iv) Indication of combustion gas velocity.
 - (v) Expected stack gas volume, flow rate, and temperature.

- (vi) Computed residence time for waste in the combustion zone.
 - (vii) Expected hydrochloric acid removal efficiency.
 - (viii) Expected fugitive emissions and their control procedures.
 - (ix) Proposed waste feed cut-off limits based on the identified significant operating parameters.
- (7) Such supplemental information as the Department finds necessary to achieve the purposes of this paragraph.

(8) Waste analysis data, including that submitted in paragraph (c)(1) above, sufficient to allow the Department to specify as permit Principal Organic Hazardous Constituents (permit POHC's) those constituents for which destruction and removal efficiencies will be required.

(d) The Department will consider a permit application without a trial burn if he finds that:

(1) The wastes are sufficiently similar; and

(2) The incinerator units are sufficiently similar and the data from other trial burns are adequate to specify (under 264.345) operating conditions that will ensure that the performance standards in Section 264.343 will be met by the incinerator.

(e) When an owner or operator of a hazardous waste incineration unit becomes subject to RCRA permit requirements after October 12, 2005, or when an owner or operator of an existing hazardous waste incineration unit demonstrates compliance with the air emission standards and limitations of section 63, subpart EEE of this chapter, (i.e., by conducting a comprehensive performance test and submitting a Notification of Compliance) under sections 63.1207(j) and 63.1210(d) of this chapter documenting compliance with all applicable requirements of part 63, subpart EEE, the requirements do not apply, except those provisions the Department determines are necessary to ensure compliance with sections 264.345(a) and 264.345(c) of this chapter if you elect to comply with section 270.235(a)(1)(i) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events. Nevertheless, the Department may apply the provisions, on a case-by-case basis, for purposes of information collection in accordance with sections 270.10(k), 270.10(l), 270.32(b)(2), and 270.32(b)(3).

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 45-5 Doc. No. 4975, eff May 28, 2021; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.20. Specific Part B information requirements for land treatment facilities.

Except as otherwise provided in 264.1, owners and operators of facilities that use land treatment to dispose of hazardous waste must provide the following additional information:

(a) A description of plans to conduct a treatment demonstration as required under R.61-79.264.272. The description must include the following information:

(1) The wastes for which the demonstration will be made and the potential hazardous constituents in the wastes;

(2) The data sources to be used to make the demonstration (e.g., literature, laboratory data, field data, or operating data);

(3) Any specific laboratory or field test that will be conducted, including

(i) The type of test (e.g., column leaching, degradation);

(ii) Materials and methods, including analytical procedures;

(iii) Expected time for completion;

(iv) Characteristics of the unit that will be simulated in the demonstration, including treatment zone characteristics, climatic conditions, and operating practices;

(b) A description of a land treatment program, as required under 264 Subpart M. This information must be submitted with the plans for the treatment demonstration, and updated following the treatment demonstration. The land treatment program must address the following items:

(1) The wastes to be land treated;

- (2) Design measures and operating practices necessary to maximize treatment in accordance with R.61-79.264.273(a) including:
- (i) Waste application method and rate;
 - (ii) Measures to control soil pH;
 - (iii) Enhancement of microbial or chemical reactions;
 - (iv) Control of moisture content;
- (3) Provisions for unsaturated zone monitoring, including:
- (i) Sampling equipment, procedures and frequency;
 - (ii) Procedures for selecting sampling locations;
 - (iii) Analytical procedures;
 - (iv) Chain of custody control;
 - (v) Procedures for establishing background values;
 - (vi) Statistical methods for interpreting results;
 - (vii) The justification for any hazardous constituents recommended for selection as principal hazardous constituents, in accordance with the criteria for such selection in R.61-79.264.278(a);
- (4) A list of hazardous constituents reasonably expected to be in, or derived from, the wastes to be land treated based on waste analysis performed pursuant to R.61-79.264.13;
- (5) The proposed dimensions of the treatment zone;
- (c) A description of how the unit is or will be designed, constructed, operated, and maintained in order to meet the requirements of R.61-79.264.273. This submission must address the following items:
- (1) Control of run-on;
 - (2) Collection and control of run-off;
 - (3) Minimization of run-off of hazardous constituents from the treatment zone;
 - (4) Management of collection and holding facilities associated with run-on and run-off control systems;
 - (5) Periodic inspection of the unit. This information should be included in the inspection plan submitted under paragraph 270.14(b)(5);
 - (6) Control of wind dispersal of particulate matter, if applicable;
- (d) If food-chain crops are to be grown in or on the treatment zone of the land treatment unit, a description of how the demonstration required under R.61-79.264.276(a) will be conducted including:
- (1) Characteristics of the food-chain crop for which the demonstration will be made;
 - (2) Characteristics of the waste, treatment zone, and waste application method and rate to be used in the demonstration;
 - (3) Procedures for crop growth sample collection, sample analysis, and data evaluation;
 - (4) Characteristics of the comparison crop including the location and conditions under which it was or will be grown.
- (e) If food-chain crops are to be grown, and cadmium is present in the land-treated waste, a description of how the requirements of R.61-79.264.276(b) will be complied with;
- (f) A description of the vegetative cover to be applied to closed portions of the facility, and a plan for maintaining such cover during the post-closure care period, as required under R.61-79.264.280(a)(8) and 264.280(c)(2). This information should be included in the closure plan and, where applicable, the post-closure care plan submitted under paragraph 270.14(b)(13);
- (g) If ignitable or reactive wastes will be placed in or on the treatment zone, an explanation of how the requirements of R.61-79.264.281 will be complied with;
- (h) If incompatible wastes, or incompatible wastes and materials, will be placed in or on the same treatment zone, an explanation of how R.61-79.264.282 will be complied with.
- (i) A waste management plan for Hazardous Waste Nos. FO20, FO21, FO22, FO23, FO26, and FO27 describing how a land treatment facility is or will be designed, constructed, operated, and

maintained to meet the requirements of R.61-79.264.283. This submission must address the following items as specified in this Section 264.283:

- (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 codisposed with these wastes; and
- (4) The effectiveness of additional treatment, design, or monitoring techniques.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 28, Issue No. 6, eff June 25, 2004.

270.21. Specific Part B information requirements for landfills.

Except as otherwise provided in R.61-79.264.1, owners and operators of facilities that dispose of hazardous waste in landfills must provide the following additional information:

- (a) A list of the hazardous wastes placed or to be placed in each landfill or landfill cell;
 - (b) Detailed plans and an engineering report describing how the landfill is designed and is or will be designed, constructed, operated, and maintained to meet the requirements of 264.19, 264.301, 264.302, and 264.303, addressing the following items:
 - (1)(i) The liner system (except for an existing portion of a landfill), if the landfill must meet the requirements of 264.301(a). If an exemption from the requirement for a liner is sought as provided by R.61-79.264.301(b), submit detailed plans, and engineering and hydrogeological reports, as appropriate, describing alternate designs and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous constituents into the groundwater or surface water at any future time; (amended 11/90)
 - (ii) The double liner and leak (leachate) detection, collection, and removal system, if the landfill must meet the requirements of section 264.301(c). If an exemption from the requirements for double liners and a leak detection, collection, and removal system or alternative design is sought as provided by section 264.301(d), (e), or (f) of this chapter, submit appropriate information;
 - (iii) If the leak detection system is located in a saturated zone, submit detailed plans and an engineering report explaining the leak detection system design and operation, and the location of the saturated zone in relation to the leak detection system;
 - (iv) The construction quality assurance (CQA) plan if required under section 264.19;
 - (v) Proposed action leakage rate, with rationale, if required under section 264.302 of this chapter, and response action plan, if required under section 264.303 of this chapter;
 - (2) Control of run-on;
 - (3) Control of run-off;
 - (4) Management of collection and holding facilities associated with run-on and run-off control systems; and
 - (5) Control of wind dispersal of particulate matter, where applicable.
- (c) A description of how each landfill, including the double liner system, leachate collection and removal system leak detection system, cover system, and appurtenances for control of run-on and run-off, will be inspected in order to meet the requirements of 264.303(a), (b), and (c) of this chapter. This information must be included in the inspection plan submitted under 270.14(b)(5);
 - (d) A description of how each landfill, including the liner and cover systems, will be inspected in order to meet the requirements of R.61-79.264.303(a) and (b). This information should be included in the inspection plan submitted under paragraph 270.14(b)(5);
 - (e) Detailed plans and an engineering report describing the final cover which will be applied to each landfill or landfill cell at closure in accordance with R.61-79.264.310(a), and a description of how each landfill will be maintained and monitored after closure in accordance with R.61-79.264.310(b). This information should be included in the closure and postclosure plans submitted under 270.14(b)(13).
 - (f) If ignitable or reactive wastes will be landfilled, an explanation of how the standards of R.61-79.264.312 will be complied with;

(g) If incompatible wastes, or incompatible wastes and materials will be landfilled, and explanation of how R.61-79.264.313 will be complied with;

(h) [Reserved]

(i) If containers of hazardous waste are to be landfilled, an explanation of how the requirements of 264.315 or 264.316, as applicable, will be complied with]

(j) A waste management plan for Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027 describing how a landfill is or will be designed, constructed, operated, and maintained to meet the requirements of R.61-79.264.317. This submission must address the following items specified in Section 264.317:

(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 attenuating 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.

(k) An estimate with justifying documentation will specify how long the facility shall be expected to meet the designed minimum technology requirements after closure.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 13, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.22. Specific Part B information requirements for boilers and industrial furnaces burning hazardous waste.

When an owner or operator of a cement or lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace becomes subject to RCRA permit requirements after October 12, 2005, or when an owner or operator of an existing cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace demonstrates compliance with the air emission standards and limitations in part 63, subpart EEE, (i.e., by conducting a comprehensive performance test and submitting a Notification of Compliance under sections 63.1207(j) and 63.1210(d) of this chapter documenting compliance with all applicable requirements of part 63, subpart EEE, of this chapter), the requirements of this section do not apply. The requirements of this section do apply, however, if the Department determines certain provisions are necessary to ensure compliance with sections 266.102(e)(1) and 266.102(e)(2)(iii) of this chapter if you elect to comply with section 270.235(a)(1)(i) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events or if you are an area source and elect to comply with the section 266.105, 266.106, and 266.107 standards and associated requirements for particulate matter, hydrogen chloride and chlorine gas, and non-mercury metals; or the Department determines certain provisions apply, on a case-by-case basis, for purposes of information collection in accordance with sections 270.10(k), 270.10(l), 270.32(b)(2), and 270.32(b)(3).

(a) Trial burns.

(1) General. Except as provided below, owners and operators that are subject to the standards to control organic emissions provided by R.61-79.266.104, standards to control particulate matter provided by R.61-79.266.105, standards to control metals emissions provided by R.61-79.266.106, or standards to control hydrogen chloride or chlorine gas emissions provided by R.61-79.266.107 must conduct a trial burn to demonstrate conformance with those standards and must submit a trial burn plan or the results of a trial burn, including all required determinations, in accordance with R.61-79.270.66.

(i) A trial burn to demonstrate conformance with a particular emission standard may be waived under provisions of 266.104 through 266.107 and paragraphs (a)(2) through (a)(5) of this section; and

(ii) The owner or operator may submit data in lieu of a trial burn, as prescribed in paragraph (a)(6) of this section.

(2) Waiver of trial burn for DRE—

(i) Boilers operated under special operating requirements. When seeking to be permitted under R.61-79.266.104(a)(4) and 266.110 that automatically waive the DRE trial burn, the owner or operator of a boiler must submit documentation that the boiler operates under the special operating requirements provided by R.61-79.266.110.

(ii) Boilers and industrial furnaces burning low risk waste. When seeking to be permitted under the provisions for low risk waste provided by 266.104(a)(5) and 266.109(a) that waive the DRE trial burn, the owner or operator must submit:

(A) Documentation that the device is operated in conformance with the requirements of 266.109(a)(1).

(B) Results of analyses of each waste to be burned, documenting the concentrations of nonmetal compounds listed in appendix VIII of R.61-79.261, except for those constituents that would reasonably not be expected to be in the waste. The constituents excluded from analysis must be identified and the basis for their exclusion explained. The analysis must rely on analytical techniques specified in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (incorporated by reference, see 260.11).

(C) Documentation of hazardous waste firing rates and calculations of reasonable, worst-case emission rates of each constituent identified in paragraph (a)(2)(ii)(B) of this section using procedures provided by 266.109(a)(2)(ii).

(D) Results of emissions dispersion modeling for emissions identified in paragraphs (a)(2)(ii)(C) of this section using modeling procedures prescribed by 266.106(h). The Department will review the emission modeling conducted by the applicant to determine conformance with these procedures. The Department will either approve the modeling or determine that alternate or supplementary modeling is appropriate.

(E) Documentation that the maximum annual average ground level concentration of each constituent identified in paragraph (a)(2)(ii)(B) of this section quantified in conformance with paragraph (a)(2)(ii)(D) of this section does not exceed the allowable ambient level established in appendices IV or V of part 266. The acceptable ambient concentration for emitted constituents for which a specific Reference Air Concentration has not been established in appendix IV or Risk-Specific Dose has not been established in appendix V is 0.1 micrograms per cubic meter, as noted in the footnote to appendix IV.

(3) Waiver of trial burn for metals. When seeking to be permitted under the Tier I (or adjusted Tier I) metals feed rate screening limits provided by 266.106(b) and (e) that control metals emissions without requiring a trial burn, the owner or operator must submit:

(i) Documentation of the feed rate of hazardous waste, other fuels, and industrial furnace feed stocks;

(ii) Documentation of the concentration of each metal controlled by 266.106(b) or (e) in the hazardous waste, other fuels, and industrial furnace feedstocks, and calculations of the total feed rate of each metal;

(iii) Documentation of how the applicant will ensure that the Tier I feed rate screening limits provided by 266.106(b) or (e) will not be exceeded during the averaging period provided by that paragraph;

(iv) Documentation to support the determination of the terrain-adjusted effective stack height, good engineering practice stack height, terrain type, and land use as provided by 266.106(b)(3) through (b)(5);

(v) Documentation of compliance with the provisions of 266.106(b)(6), if applicable, for facilities with multiple stacks;

(vi) Documentation that the facility does not fail the criteria provided by 266.106(b)(7) for eligibility to comply with the screening limits; and

(vii) Proposed sampling and metals analysis plan for the hazardous waste, other fuels, and industrial furnace feed stocks.

(4) Waiver of trial burn for particulate matter. When seeking to be permitted under the low risk waste provisions of 266.109(b) which waives the particulate standard (and trial burn to demonstrate conformance with the particulate standard), applicants must submit documentation supporting conformance with paragraphs (a)(2)(ii) and (a)(3) of this section.

(5) Waiver of trial burn for HCl and Cl₂. When seeking to be permitted under the Tier I (or adjusted Tier I) feed rate screening limits for total chloride and chlorine provided by 266.107(b)(1) and (e) of this chapter that control emissions of hydrogen chloride (HCl) and chlorine gas (Cl₂) without requiring a trial burn, the owner or operator must submit:

(i) Documentation of the feed rate of hazardous waste, other fuels, and industrial furnace feed stocks;

(ii) Documentation of the levels of total chloride and chlorine in the hazardous waste, other fuels, and industrial furnace feedstocks, and calculations of the total feed rate of total chloride and chlorine;

(iii) Documentation of how the applicant will ensure that the Tier I (or adjusted Tier I) feed rate screening limits provided by 266.107(b)(1) or (e) will not be exceeded during the averaging period provided by that paragraph;

(iv) Documentation to support the determination of the terrain-adjusted effective stack height, good engineering practice stack height, terrain type, and land use as provided by 266.107(b)(3);

(v) Documentation of compliance with the provisions of 266.107(b)(4), if applicable, for facilities with multiple stacks;

(vi) Documentation that the facility does not fail the criteria provided by 266.107(b)(3) for eligibility to comply with the screening limits; and

(vii) Proposed sampling and analysis plan for total chloride and chlorine for the hazardous waste, other fuels, and industrial furnace feedstocks.

(6) Data in lieu of trial burn. The owner or operator may seek an exemption from the trial burn requirements to demonstrate conformance with 266.104 through 266.107 and 270.66 by providing the information required by 270.66 from previous compliance testing of the device in conformance with 266.103, or from compliance testing or trial or operational burns of similar boilers or industrial furnaces burning similar hazardous wastes under similar conditions. If data from a similar device is used to support a trial burn waiver, the design and operating information required by 270.66 must be provided for both the similar device and the device to which the data is to be applied, and a comparison of the design and operating information must be provided. The Department shall approve a permit application without a trial burn if he finds that the hazardous wastes are sufficiently similar, the devices are sufficiently similar, the operating conditions are sufficiently similar, and the data from other compliance tests, trial burns, or operational burns are adequate to specify (under 266.102) operating conditions that will ensure conformance with 266.102(c). In addition, the following information shall be submitted:

(i) For a waiver from any trial burn:

(A) A description and analysis of the hazardous waste to be burned compared with the hazardous waste for which data from compliance testing, or operational or trial burns are provided to support the contention that a trial burn is not needed;

(B) The design and operating conditions of the boiler or industrial furnace to be used, compared with that for which comparative burn data are available; and

(C) Such supplemental information as the Department finds necessary to achieve the purposes of this paragraph.

(ii) For a waiver of the DRE trial burn, the basis for selection of POHCs used in the other trial or operational burns which demonstrate compliance with the DRE performance standard in 266.104(a). This analysis should specify the constituents in appendix VIII, part 261, that the applicant has identified in the hazardous waste for which a permit is sought, and any differences from the POHCs in the hazardous waste for which burn data are provided.

(b) Alternative HC limit for industrial furnaces with organic matter in raw materials. Owners and operators of industrial furnaces requesting an alternative HC limit under 266.104(f) shall submit the following information at a minimum:

(1) Documentation that the furnace is designed and operated to minimize HC emissions from fuels and raw materials;

(2) Documentation of the proposed baseline flue gas HC (and CO) concentration, including data on HC (and CO) levels during tests when the facility produced normal products under normal operating conditions from normal raw materials while burning normal fuels and when not burning hazardous waste;

(3) Test burn protocol to confirm the baseline HC (and CO) level including information on the type and flow rate of all feedstreams, point of introduction of all feedstreams, total organic carbon content (or other appropriate measure of organic content) of all nonfuel feedstreams, and operating conditions that affect combustion of fuel(s) and destruction of hydrocarbon emissions from nonfuel sources;

(4) Trial burn plan to:

(i) Demonstrate that flue gas HC (and CO) concentrations when burning hazardous waste do not exceed the baseline HC (and CO) level; and

(ii) Identify the types and concentrations of organic compounds listed in appendix VIII, part 261, that are emitted when burning hazardous waste in conformance with procedures prescribed by the Department;

(5) Implementation plan to monitor over time changes in the operation of the facility that could reduce the baseline HC level and procedures to periodically confirm the baseline HC level; and

(6) Such other information as the Department finds necessary to achieve the purposes of this paragraph.

(c) Alternative metals implementation approach. When seeking to be permitted under an alternative metals implementation approach under R.61-79.266.106(f), the owner or operator must submit documentation specifying how the approach ensures compliance with the metals emissions standards of 266.106(c) or (d) and how the approach can be effectively implemented and monitored. Further, the owner or operator shall provide such other information that the Department finds necessary to achieve the purposes of this paragraph.

(d) Automatic waste feed cutoff system. Owners and operators shall submit information describing the automatic waste feed cutoff system, including any pre-alarm systems that may be used.

(e) Direct transfer. Owners and operators that use direct transfer operations to feed hazardous waste from transport vehicles (containers, as defined in R.61-79.266.111) directly to the boiler or industrial furnace shall submit information supporting conformance with the standards for direct transfer provided by R.61-79.266.111.

(f) Residues. Owners and operators that claim that their residues are excluded from regulation under the provisions of R.61-79.266.112 must submit information adequate to demonstrate conformance with those provisions.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 18, Issue No. 12, eff December 23, 1994. Amended by State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; Amended by State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.23. Specific Part B information requirements for miscellaneous units.

Except as otherwise provided in 264.600, owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units must provide the following additional information:

(a) A detailed description of the unit being used or proposed for use, including the following:

(1) Physical characteristics, materials of construction, and dimensions of the unit;

(2) Detailed plans and engineering reports describing how the unit will be located, designed, constructed, operated maintained, monitored, inspected, and closed to comply with the requirements of 264.601 and 264.602; and

(3) For disposal units, a detailed description of the plans to comply with the post-closure requirements of 264.603.

(b) Detailed hydrologic, geologic, and meteorologic assessments and land-use maps for the region surrounding the site that address and ensure compliance of the unit with each factor in the environmental performance standards of 264.601. If the applicant can demonstrate that he does not violate the environmental performance standards of 264.601 and the Department agrees with such demonstration, preliminary hydrologic, geologic, and meteorologic assessments will suffice.

(c) Information on the potential pathways of exposure of humans or environmental receptors to hazardous waste or hazardous constituents and on the potential magnitude and nature of such exposures.

(d) For any treatment unit, a report on a demonstration of the effectiveness of the treatment based on laboratory or field data.

(e) Any additional information determined by the Department to be necessary for evaluation of compliance of the unit with the environmental performance standards of 264.601.

HISTORY: Added by State Register Volume 14, Issue No. 11, eff November 23, 1990.

270.24. Specific Part B information requirements for process vents.

Except as otherwise provided in 264.1, owners and operators of facilities that have process vents to which subpart AA of part 264 applies must provide the following additional information:

(a) For facilities that cannot install a closed vent system and control device to comply with the provisions of 264 subpart AA on the effective date that the facility becomes subject to the provisions of 264 or 265 subpart AA, an implementation schedule as specified in 264.1033(a)(2).

(b) Documentation of compliance with the process vent standards in 264.1032, including:

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

(2) Information and data supporting estimates of vent emissions and emission reduction achieved by add on control devices based on engineering calculations or source tests. For the purpose of determining compliance, estimates of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates, or concentrations) that represent the conditions that exist when the waste management unit is operating at the highest load or capacity level reasonably expected to occur.

(3) Information and data used to determine whether or not a process vent is subject to the requirements of 264.1032.

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with the requirements of 264.1032, and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in 264.1035(b)(3).

(d) Documentation of compliance with 264.1033, including:

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

(2) Records, including the dates, of each compliance test required by 264.1033(k).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in 270.6) or other engineering texts acceptable to the Department that present basic control device information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in Sec. 264.1035(b)(4)(iii).

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

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater unless the total organic emission limits of 264.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 32, Issue No. 6, eff June 27, 2008.

270.25. Specific part B information requirements for equipment.

Except as otherwise provided in 264.1, owners and operators of facilities that have equipment to which subpart BB of part 264 applies must provide the following additional information:

(a) For each piece of equipment to which subpart BB of part 264 applies:

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

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

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

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

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

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

(b) For facilities that cannot install a closed vent system and control device to comply with the provisions of 264 subpart BB on the effective date that the facility becomes subject to the provisions of 264 or 265 subpart BB, an implementation schedule as specified in 264.1033(a)(2).

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in 264.1035(b)(3).

(d) Documentation that demonstrates compliance with the equipment standards in 264.1052 to 264.1059. This documentation shall contain the records required under 264.1064. The Department or Regional Administrator may request further documentation before deciding if compliance has been demonstrated. (revised 5/96)

(e) Documentation to demonstrate compliance with 264.1060 shall include the following information:

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

(2) Records, including the dates, of each compliance test required by 264.1033(j).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of APTI Course 415: Control of Gaseous Emissions (incorporated by reference as specified in 270.6) or other engineering texts acceptable to the Department that present basic control device information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in 264.1035(b)(4)(iii).

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

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.26. Special part B information requirements for drip pads.

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

(a) A list of hazardous wastes placed or to be placed on each drip pad.

(b) If an exemption is sought to subpart F of part 264 of this chapter, as provided by 264.90 of this chapter, detailed plans and an engineering report describing how the requirements of 264.90(b)(2) of this chapter will be met.

(c) Detailed plans and an engineering report describing how the drip pad is or will be designed, constructed, operated and maintained to meet the requirements of 264.573 of this chapter, including the as-built drawings and specifications. This submission must address the following items as specified in 264.571 of this chapter:

(1) The design characteristics of the drip pad;

(2) The liner system;

(3) The leakage detection system, including the leak detection system and how it is designed to detect the failure of the drip pad or the presence of any releases of hazardous waste or accumulated liquid at the earliest practicable time;

(4) Practices designed to maintain drip pads;

(5) The associated collection system;

(6) Control of run on to the drip pad;

(7) Control of runoff from the drip pad;

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

(9) Procedures for cleaning the drip pad at least once every seven days to ensure the removal of any accumulated residues of waste or other materials, including but not limited to rinsing, washing with detergents or other appropriate solvents, or steam cleaning and provisions for documenting the date, time, and cleaning procedure used each time the pad is cleaned.

(10) Operating practices and procedures that will be followed to ensure that tracking of hazardous waste or waste constituents off the drip pad due to activities by personnel or equipment is minimized;

(11) Procedures for ensuring that, after removal from the treatment vessel, treated wood from pressure and nonpressure processes is held on the drip pad until drippage has ceased, including recordkeeping practices;

(12) Provisions for ensuring that collection and holding units associated with the run on and runoff control systems are emptied or otherwise managed as soon as possible after storms to maintain design capacity of the system;

(13) If treatment is carried out on the drip pad, details of the process equipment used, and the nature and quality of the residuals.

(14) A description of how each drip pad, including appurtenances for control of run on and runoff, will be inspected in order to meet the requirements of 264.573 of this chapter. This information should be included in the inspection plan submitted under 270.14(b)(5) of this part.

(15) A certification signed by a qualified Professional Engineer, stating that the drip pad design meets the requirements of paragraphs (a) through (f) of section 264.573.

(16) A description of how hazardous waste residues and contaminated materials will be removed from the drip pad at closure, as required under 264.575(a) of this chapter. For any waste not to be removed from the drip pad upon closure, the owner or operator must submit detailed plans and an engineering report describing how 264.310 (a) and (b) of this chapter will be complied with. This

information should be included in the closure plan and, where applicable, the postclosure plan submitted under 270.14(b)(13).

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 44-6 Doc. No. 4883, eff June 26, 2020.

270.27. Specific Part B information requirements for air emission controls for tanks, surface impoundments, and containers.

(a) Except as otherwise provided in 264.1, owners and operators of tanks, surface impoundments, or containers that use air emission controls in accordance with the requirements of 264 subpart CC shall provide the following additional information:

(1) Documentation for each floating roof cover installed on a tank subject to 264.1084(d)(1) or 264.1084(d)(2) that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the applicable design specifications as listed in 264.1084(e)(1) or 264.1084(f)(1).

(2) Identification of each container area subject to the requirements of 264, subpart CC and certification by the owner or operator that the requirements of this subpart are met.

(3) Documentation for each enclosure used to control air pollutant emissions from tanks or containers in accordance with the requirements of 264.1084(d)(5) or 264.1086(e)(1)(ii) that includes records for the most recent set of calculations and measurements performed by the owner or operator to verify that the enclosure meets the criteria of a permanent total enclosure as specified in "Procedure T—Criteria for and Verification of a Permanent or Temporary Total Enclosure" under 40 CFR 52.741, appendix B.

(4) Documentation for each floating membrane cover installed on a surface impoundment in accordance with the requirements of 264.1085(c) that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the specifications listed in 264.1085(c)(1).

(5) Documentation for each closed-vent system and control device installed in accordance with the requirements of 264.1087 that includes design and performance information as specified in 270.24(c) and (d) of this part.

(6) An emission monitoring plan for both Method 21 in 40 CFR part 60, appendix A and control device monitoring methods. This plan shall include the following information: monitoring point(s), monitoring methods for control devices, monitoring frequency, procedures for documenting exceedances, and procedures for mitigating noncompliances.

(7) When an owner or operator of a facility subject to part 265, subpart CC cannot comply with part 264, subpart CC by the date of permit issuance, the schedule of implementation required under 265.1082.

HISTORY: Added by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; Amended by State Register Volume 25, Issue No. 10, eff October 26, 2001.

270.28. Part B information requirements for post-closure permits.

For post-closure permits, the owner or operator is required to submit only the information specified in 270.14(b)(1), (4), (5), (6), (11), (13), (14), (16), (18) and (19), (c), and (d), unless the Department determines that additional information from 270.14, 270.16, 270.17, 270.18, 270.20, or 270.21 is necessary.

HISTORY: Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.29. Permit denial.

The Department may, pursuant to the procedures in part 124, deny the permit application either in its entirety or as to the active life of a hazardous waste management facility or unit only.

HISTORY: Added by State Register Volume 16, Issue No. 12, eff December 25, 1992. Amended by SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

SUBPART C
Permit Conditions

270.30. Conditions applicable to all permits.

The following conditions apply to all permits under these regulations, and shall be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations must be given in the permit. (revised 12/92)

(a) Duty to comply. The permittee must comply with all conditions included in his approved permit application, all conditions and restrictions placed upon its permit, all applicable regulations promulgated pursuant to the Act, and all orders issued by the Board, Commissioner, or Department, except that the permittee need not comply with the conditions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit. (See 270.61). Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the appropriate Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.

(b) Duty to reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

(c) Need to halt or reduce activity not a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of its permit.

(d) In the event of noncompliance with the permit, the permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

(e) Proper operation and maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of its permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of its permit.

(f) Permit actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

(g) Property rights. The permit does not convey any property rights of any sort, or any exclusive privilege.

(h) Duty to provide information. The permittee shall furnish to the Department within a reasonable time, any relevant information which the Department may request to determine whether cause exists for modifying, revoking and reissuing, or terminating its permit, or to determine compliance with its permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by its permit.

(i) Inspection and entry. The permittee shall allow an authorized representative of the Department upon the presentation of credentials and other documents as may be required by law, to:

(1) Enter at reasonable times upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of its permit;

(2) Have access to and copy, at reasonable times, any records that must be kept under the conditions of its permit;

(3) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under its permit; and

(4) Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

(j) Monitoring and records.

(1) Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity.

(2) The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports specified in his permit application and required by this permit, the certification required by R.61-79.264.73(b)(9), and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report, certification, or application. This period may be extended by request of the Department at anytime. The permittee shall maintain records from all groundwater monitoring wells and associated groundwater surface elevations, for the active life of the facility, and for disposal facilities for the postclosure care period as well.

(3) Records for monitoring information shall include:

- (i) The date, exact place, and time of sampling or measurements;
- (ii) The individual(s) who performed the sampling or measurements;
- (iii) The date(s) analyses were performed;
- (iv) The individual(s) who performed the analyses;
- (v) The analytical techniques or methods used; and
- (vi) The results of such analyses.

(k) Signatory requirements. All applications, reports, or information submitted to the Department shall be signed and certified. (See 270.11.)

(l) Reporting requirements.

(1) Planned changes. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the permitted facility.

(2) Anticipated noncompliance. The permittee shall give advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements. For a new facility, the permittee may not treat, store, or dispose of hazardous waste; and for a facility being modified, the permittee may not treat, store, or dispose of hazardous waste in the modified portion of the facility (except as provided in 270.42), until: (amended 11/90)

(i) The permittee has submitted to the Department by certified mail or hand delivery a letter signed by the permittee and a registered professional engineer stating that the facility has been constructed or modified in compliance with the permit; and

(ii)(A) The department has inspected the modified or newly constructed facility and finds it is in compliance with the conditions of th permit; or (revised 12/92)

(B) Within 15 days of the date of submission of the letter in paragraph (l)(2)(i) of this section, the permittee has not received notice from the Department of his or her intent to inspect, prior inspection is waived and the permittee may commence treatment, storage, or disposal of hazardous waste.

(3) Transfers. The Department may transfer a permit when notified according to the provisions of Section 270.40. A permit is not transferable to any person. The Department may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under these Regulations. (See 270.40)

(4) Monitoring reports. Monitoring results shall be reported at the intervals specified by the Department.

(5) Compliance schedules. Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

(6) Twenty-four hour reporting.

(i) The permittee shall report any noncompliance which may endanger health or the environment orally within 24 hours from the time the permittee becomes aware of the circumstances including:

(A) Information concerning release of any hazardous waste that may cause an endangerment to public drinking water supplies.

(B) Any information of a release or discharge of hazardous waste or of a fire or explosion from the HWM facility, which could threaten the environment or human health outside the facility.

(ii) The description of the occurrence and its cause shall include:

(A) Name, address, and telephone number of the owner or operator;

(B) Name, address, and telephone number of the facility;

(C) Date, time and type of incident;

(D) Name and quantity of material(s) involved;

(E) The extent of injuries, if any;

(F) An assessment of actual or potential hazards to the environment and human health outside the facility, where this is applicable; and

(G) Estimated quantity and disposition of recovered material that resulted from the incident.

(iii) A written submission shall also be provided to the Department within 5 days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Department may waive the five day written notice requirement in favor of a written report within fifteen days.

(7) Manifest discrepancy report: If a significant discrepancy in a manifest is discovered, the permittee must attempt to reconcile the discrepancy. If not resolved within fifteen days, the permittee must submit a letter report, including a copy of the manifest, to the Department (See 264.72.)

(8) Unmanifested waste report: This report must be submitted to the Department within fifteen days of receipt of unmanifested waste. (See 264.76)

(9) Quarterly reports. The permittee shall submit quarterly reports of waste types and quantities as specified by R.61-79.264.75.

(10) Other noncompliance. The permittee shall report all instances of noncompliance not reported under paragraphs (l) (4), (5), and (6) at the time quarterly reports are submitted. The reports shall contain the information listed in paragraph (l)(6).

(11) Other information. Where the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Department, it shall promptly submit such facts or information.

(m) Information repository. The Department may require the permittee to establish and maintain an information repository at any time, based on the factors set forth in 124.33(b). The information repository will be governed by the provisions in 124.33(c) through (f).

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

270.31. Requirements for recording and reporting of monitoring results.

All permit applications shall specify:

(a) The proper use, maintenance, and installation, when appropriate, of monitoring equipment or methods (including biological monitoring methods when appropriate);

(b) Required monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity including, when appropriate, continuous monitoring;

(c) Applicable reporting requirements based upon the impact of the regulated activity and as specified in R.61-79.264, 265, and 266. Reporting shall be no less frequent than specified in the above regulation.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.32. Establishing permit conditions.

(a) In addition to conditions required in all permits (section 270.30), the Department shall establish conditions, as required on a case-by-case basis, in permits under 270.50 (duration of permits), 270.33(a) (schedules of compliance), 270.31 (monitoring), 270.33(b) (alternate schedules of compliance) and 270.3 (considerations under Federal law) (revised 12/92)

(b)(1) Each RCRA permit shall include permit conditions necessary to achieve compliance with the Act and regulations, including each of the applicable requirements specified in R.61-79.264, and R.61-79.266 through 268. In satisfying this provision, the Department may incorporate applicable requirements of parts 264, and 266 through 268 of this chapter directly into the permit or establish other permit conditions that are based on these parts. (revised 12/92)

(2) Each permit issued under section 3005 of RCRA shall contain terms and conditions as the Department determines necessary to protect human health and the environment. (revised 12/92)

(3) If, as the result of an assessment(s) or other information, the Department determines that conditions are necessary in addition to those required under 40 CFR parts 63, subpart EEE, R.61-79.264 or R.61-79.266 to ensure protection of human health and the environment, he or she shall include those terms and conditions in a RCRA permit for a hazardous waste combustion unit.

(c) For a State issued permit, an applicable requirement is a State statutory or regulatory requirement which takes effect prior to final administrative disposition of a permit. For a permit issued by EPA, an applicable requirement is a statutory or regulatory requirement (including any interim final regulation) which takes effect prior to the issuance of the permit. Section 124.14 (reopening of comment period) provides a means for reopening permit proceedings at the discretion of the Region or Department where new requirements become effective during the permitting process and are of sufficient magnitude to make additional proceedings desirable. For State and EPA administered programs, an applicable requirement is also any requirement which takes effect prior to the modification or revocation and reissuance of a permit, to the extent allowed in 270.41.

(d) New or reissued permits, and to the extent allowed under 270.41, modified or revoked and reissued permits, shall incorporate each of the applicable requirements referenced in this section and in 270.31.

(e) Incorporation. All permit conditions shall be incorporated either expressly or by reference. If incorporated by reference, a specific citation to the applicable regulations or requirements must be given in the permit.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.33. Schedules of compliance.

(a) The permit may, when appropriate, specify a schedule of compliance leading to compliance with the Act and regulations.

(1) Time for compliance. Any schedules of compliance under this section shall require compliance as soon as possible.

(2) Interim dates. Except as provided in paragraph (b)(1)(ii) of this section, if a permit establishes a schedule of compliance which exceeds 1 year from the date of permit issuance, the schedule shall set forth interim requirements and the dates for their achievement.

(i) The time between interim dates will not exceed 1 year.

(ii) If the time necessary for completion of any interim requirement is more than 1 year and is not readily divisible into stages for completion, the permit shall specify interim dates for the

submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.

(3) Reporting. The permit shall be written to require that no later than 14 days following each interim date and the final date of compliance, the permittee shall notify the Department in writing of its compliance or noncompliance with the interim or final requirements.

(b) Alternative schedules of compliance. A RCRA permit applicant or permittee may cease conducting regulated activities (by receiving a terminal volume of hazardous waste and, for treatment and storage HWM facilities, closing pursuant to applicable requirements; and, for disposal HWM facilities, closing and conducting postclosure care pursuant to applicable requirements) rather than continue to operate and meet permit requirements as follows: (amended 11/90)

(1) If the permittee decides to cease conducting regulated activities at a given time within the term of a permit which has already been issued;

(i) The permit may be modified to contain a new or additional schedule leading to timely cessation of activities; or

(ii) The permittee shall cease conducting permitted activities before noncompliance with any interim or final compliance schedule requirement already specified in the permit.

(2) If the decision to cease conducting regulated activities is made before issuance of a permit whose term will include the termination date, the permit will contain a schedule leading to termination which ensures timely compliance with applicable requirements.

(3) If the permittee is undecided whether to cease conducting regulated activities, the Department may issue or modify a permit to contain two schedules as follows:

(i) Both schedules will contain an identical interim deadline requiring a final decision on whether to cease conducting regulated activities no later than a date which ensures sufficient time to comply with applicable requirements in a timely manner if the decision is to continue conducting regulated activities.

(ii) One schedule will lead to timely compliance with applicable requirements;

(iii) The second schedule will lead to cessation of regulated activities by a date which ensures timely compliance with applicable requirements;

(iv) Each permit containing two schedules will include a requirement that after the permittee has made a final decision under paragraph (b)(3)(i) of this section it shall follow the schedule leading to compliance if the decision is to continue conducting regulated activities and follow the schedule leading to termination if the decision is to cease conducting regulated activities.

(4) The applicant's or permittee's decision to cease conducting regulated activities shall be evidenced by a firm public commitment satisfactory to the Department, such as a resolution of the board of directors of a corporation.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART D
Changes to Permit

270.40. Transfer of permits.

(a) A permit may be transferred by the permittee to a new owner or operator only if the permit has been modified or revoked and reissued (under 270.40(b) or 270.41(b)(2)) to identify the new permittee and incorporate such other requirements as may be necessary under the appropriate Act.

(b) Changes in the ownership or operational control of a facility may be made as a Class 1 modification with prior written approval of the Department in accordance with 270.42. The new owner or operator must submit a revised permit application no later than 90 days prior to the scheduled change. A written agreement containing a specific date for transfer of permit responsibility between the current and new permittees must also be submitted to the Department. When a transfer of ownership or operational control occurs, the old owner or operator shall comply with the requirements of Part 264, Subpart H (Financial Requirements) until the new owner or operator has demonstrated that he or she is complying with the requirements of that subpart. The new owner or operator must demonstrate

compliance with subpart H requirements within six months of the date of the change of ownership or operational control of the facility. Upon demonstration to the Department by the new owner or operator of compliance with subpart H, the Department shall notify the old owner or operator that he or she no longer needs to comply with subpart H as of the date of demonstration. (amended 5/93)

HISTORY: Amended by State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997.

270.41. Modification or revocation and reissuance of permits.

When the Department receives any information (for example, inspects the facility, receives information submitted by the permittee as required in the permit (see section 270.30), receives a request for modification or revocation and reissuance under R.61-79.124.5 or conducts a review of the permit file), it may determine whether one or more of the causes listed in paragraphs (a) and (b) of this section for modification, or revocation and reissuance or both exist. If cause exists, the Department may modify or revoke and reissue the permit accordingly, subject to the limitations of paragraph (c) of this section, and may request an updated application if necessary. When a permit is modified, only the conditions subject to modification are reopened. If a permit is revoked and reissued, the entire permit is reopened and subject to revision and the permit is reissued for a new term. (See 124.5.) If cause does not exist under this section, the Department shall not modify or revoke and reissue the permit, except on request of the permittee. If a permit modification is requested by the permittee, the Department shall approve or deny the request according to the procedures of section 270.42. Otherwise, a draft permit must be prepared and other procedures in R.61-79.124 followed. (amended 5/93; 12/93)

(a) Causes for modification. The following are causes for modification, but not revocation and reissuance, of permits; the following may be causes for revocation and reissuance as well as modification, when the permittee requests or agrees.

(1) Alterations. There are material and substantial alterations or additions to the permitted facility or activity which occurred after permit issuance which justify the application of permit conditions that are different or absent in the existing permit.

(2) Information. The Department has received information. Permits may be modified during their terms for this cause only if the information was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and would have justified the application of different permit conditions at the time of issuance.

(3) New statutory requirements or regulations. The standards or regulations on which the permit was based have been changed by statute, through promulgation of new or amended standards or regulations or by judicial decision after the permit was issued.

(4) Compliance schedules. The Department determines good cause exists for modification of a compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which the permittee has little or no control and for which there is no reasonably available remedy.

(5) Notwithstanding any other provision in this section, when a permit for a land disposal facility is reviewed by the Department under section 270.50(d), the Department shall modify the permit as necessary to assure that the facility continues to comply with the currently applicable requirements in R.61-79.124, R.61-79.260 through R.61-79.266, and R.61-79.270. (amended 5/93; 12/93)

(b) Causes for modification or revocation and reissuance. The following are causes to modify or, alternatively, revoke and reissue a permit;

(1) Cause exists for termination under Section 270.43, and the Department determines that modification or revocation and reissuance is appropriate.

(2) The Department has received notification of a proposed transfer under Section 270.30(l)(3).

(c) Facility siting. Suitability of the facility location will not be considered at the time of permit modification or revocation and reissuance unless new information or standards indicate that a threat to human health or the environment exists which was unknown at the time of permit issuance.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 12, Issue No. 10, eff October 28, 1988; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997.

270.42. Permit modifications at the request of the permittee.

(a) Class 1 modifications.

(1) Except as provided in paragraph (a)(2) of this section, the permittee may put into effect Class 1 modifications listed in Appendix I of this section under the following conditions:

(i) The permittee must notify the Department concerning the modification by certified mail or other means that establish proof of delivery within 7 calendar days after the change is put into effect. This notice must specify the changes being made to permit conditions or supporting documents referenced by the permit and must explain why they are necessary. Along with the notice, the permittee must provide the applicable information required by 270.13 through 270.21, 270.62, and 270.63.

(ii) The permittee must send a notice of the modification to all persons on the facility mailing list, maintained by the Department in accordance with 124.10(c), and the appropriate units of State and local government, as specified in 124.10(c). This notification must be made within 90 calendar days after the change is put into effect. For the Class 1 modifications that require prior Department approval, the notification must be made within 90 calendar days after the Department approves the request.

(iii) Any person may request the Department to review, and the Department may for cause reject in accordance with 124.5, any Class 1 modification. The Department must inform the permittee by certified mail that a Class 1 modification has been rejected, explaining the reasons for the rejection. If a Class 1 modification has been rejected, the permittee must comply with the original permit conditions.

(2) Class 1 permit modifications identified in appendix I by a superscript may be made only with the prior written approval of the Department.

(3) For a Class 1 permit modification, the permittee may elect to follow the procedures in 270.42(b) for Class 2 modifications instead of the Class 1 procedures. The permittee must inform the Department of this decision in the notice required in 270.42(b)(1).

(b) Class 2 modifications.

(1) For Class 2 modifications, listed in Appendix I of this section, the permittee must submit a modification request to the Department that:

(i) Describes the exact change to be made to the permit conditions and supporting documents referenced by the permit;

(ii) Identifies that the modification is a Class 2 modification;

(iii) Explains why the modification is needed; and

(iv) Provides the applicable information required by 270.13 through 270.21, 270.62, and 270.63.

(2) The permittee must send a notice of the modification request to all persons on the facility mailing list maintained by the Department and to the appropriate units of State and local government as specified in 124.10(c) and must publish this notice in a major local newspaper of general circulation. This notice must be mailed and published within 7 days before or after the date of submission of the modification request, and the permittee must provide to the Department evidence of the mailing and publication. The notice must include:

(i) Announcement of a 60-day comment period, in accordance with 270.42(b)(5), and the name and address of an Department contact to whom comments must be sent;

(ii) Announcement of the date, time, and place for a public meeting held in accordance with 270.42(b)(4);

(iii) Name and telephone number of the permittee's contact person;

(iv) Name and telephone number of a Department contact person;

(v) Location where copies of the modification request and any supporting documents can be viewed and copied; and

(vi) The following statement: "The permittee's compliance history during the life of the permit being modified is available from the Department contact person."

(3) The permittee must place a copy of the permit modification request and supporting documents in a location accessible to the public in the vicinity of the permitted facility.

(4) The permittee must hold a public meeting no earlier than 15 days after the publication of the notice required in paragraph (b)(2) of this section and no later than 15 days before the close of the 60-day comment period. The meeting must be held to the extent practicable in the vicinity of the permitted facility.

(5) The public shall be provided 60 days to comment on the modification request. The comment period will begin on the date the permittee publishes the notice in the local newspaper. Comments should be submitted to the Department contact identified in the public notice.

(6)(i) No later than 90 days after receipt of the notification request, the Department must:

(A) Approve the modification request, with or without changes, and modify the permit accordingly;

(B) Deny the request;

(C) Determine that the modification request must follow the procedures in 270.42(c) for Class 3 modifications for the following reasons:

(1) There is significant public concern about the proposed modification; or

(2) The complex nature of the change requires the more extensive procedures of Class 3.

(D) Approve the request, with or without changes, as a temporary authorization having a term of up to 180 days, or

(E) Notify the permittee that the Department will decide on the request within the next 30 days.

(ii) If the Department notifies the permittee of a 30-day extension for a decision, the Department must, no later than 120 days after receipt of the modification request:

(A) Approve the modification request, with or without changes, and modify the permit accordingly;

(B) Deny the request; or

(C) Determine that the modification request must follow the procedures in 270.42(c) for Class 3 modifications for the following reasons:

(1) There is significant public concern about the proposed modification; or

(2) The complex nature of the change requires the more extensive procedures of Class 3.

(D) Approve the request, with or without changes, as a temporary authorization having a term of up to 180 days.

(iii) If the Department fails to make one of the decisions specified in paragraph (b)(6)(ii) of this section by the 120th day after receipt of the modification request, the permittee is automatically authorized to conduct the activities described in the modification request for up to 180 days, without formal Department action. The authorized activities must be conducted as described in the permit modification request and must be in compliance with all appropriate standards of Part 265. If the Department approves, with or without changes, or denies the modification request during the term of the temporary or automatic authorization provided for in paragraphs (b)(6) (i), (ii), or (iii) of this section, such action cancels the temporary or automatic authorization.

(iv)(A) In the case of an automatic authorization under paragraph (b)(6)(iii) of this section, or a temporary authorization under paragraph (b)(6) (i)(D) or (ii)(D) of this section, if the Department has not made a final approval or denial of the modification request by the date 50 days prior to the end of the temporary or automatic authorization, the permittee must within seven days of that time send a notification to persons on the facility mailing list, and make a reasonable effort to notify other persons who submitted written comments on the modification request, that:

(1) The permittee has been authorized temporarily to conduct the activities described in the permit modification request, and

(2) Unless the Department acts to give final approval or denial of the request by the end of the authorization period, the permittee will receive authorization to conduct such activities for the life of the permit.

(B) If the owner/operator fails to notify the public by the date specified in paragraph (b)(6)(iv)(A) of this section, the effective date of the permanent authorization will be deferred until 50 days after the owner/operator notifies the public.

(v) Except as provided in paragraph (b)(6)(vii) of this section, if the Department does not finally approve or deny a modification request before the end of the automatic or temporary authorization period or reclassify the modification as a Class 3, the permittee is authorized to conduct the activities described in the permit modification request for the life of the permit unless modified later under 270.41 or 270.42. The activities authorized under this paragraph must be conducted as described in the permit modification request and must be in compliance with all appropriate standards of Part 265.

(vi) In making a decision to approve or deny a modification request, including a decision to issue a temporary authorization or to reclassify a modification as a Class 3, the Department must consider all written comments submitted to the Department during the public comment period and must respond in writing to all significant comments in his or her decision.

(vii) With the written consent of the permittee, the Department may extend indefinitely or for a specified period the time periods for final approval or denial of a modification request or for reclassifying a modification as a Class 3.

(7) The Department may deny or change the terms of a Class 2 permit modification request under paragraphs (b)(6) (i) through (iii) of this section for the following reasons:

(i) The modification request is incomplete;

(ii) The requested modification does not comply with the appropriate requirements of Part 264 or other applicable requirements; or

(iii) The conditions of the modification fail to protect human health and the environment.

(8) The permittee may perform any construction associated with a Class 2 permit modification request beginning 60 days after the submission of the request unless the Department establishes a later date for commencing construction and informs the permittee in writing before day 60.

(c) Class 3 modifications.

(1) For Class 3 modifications listed in Appendix I of this section, the permittee must submit a modification request to the Department that:

(i) Describes the exact change to be made to the permit conditions and supporting documents referenced by the permit;

(ii) Identifies that the modification is a Class 3 modification;

(iii) Explains why the modification is needed; and

(iv) Provides the applicable information required by 270.13 through 270.22, 270.62, 270.63, and 270.66.

(2) The permittee must send a notice of the modification request to all persons on the facility mailing list maintained by the Department and to the appropriate units of State and local government as specified in 124.10(c) and must publish this notice in a major local newspaper of general circulation. This notice must be mailed and published within seven days before or after the date of submission of the modification request, and the permittee must provide to the Department evidence of the mailing and publication. The notice must include:

(i) Announcement of a 60-day comment period, and a name and address of a Department contact to whom comments must be sent;

(ii) Announcement of the date, time, and place for a public meeting on the modification request, in accordance with 270.42(c)(4);

(iii) Name and telephone number of the permittee's contact person;

(iv) Name and telephone number of an Department contact person;

(v) Location where copies of the modification request and any supporting documents can be viewed and copied; and

(vi) The following statement: "The permittee's compliance history during the life of the permit being modified is available from the Department contact person."

(3) The permittee must place a copy of the permit modification request and supporting documents in a location accessible to the public in the vicinity of the permitted facility.

(4) The permittee must hold a public meeting no earlier than 15 days after the publication of the notice required in paragraph (c)(2) of this section and no later than 15 days before the close of the 60-day comment period. The meeting must be held to the extent practicable in the vicinity of the permitted facility.

(5) The public shall be provided at least 60 days to comment on the modification request. The comment period will begin on the date the permittee publishes the notice in the local newspaper. Comments should be submitted to the Department contact identified in the notice.

(6) After the conclusion of the 60-day comment period, the Department must grant or deny the permit modification request according to the permit modification procedures of Part 124. In addition, the Department must consider and respond to all significant written comments received during the 60-day comment period.

(d) Other modifications.

(1) In the case of modifications not explicitly listed in Appendix I of this section, the permittee may submit a Class 3 modification request to the Department, or he or she may request a determination by the Department that the modification should be reviewed and approved as a Class 1 or Class 2 modification. If the permittee requests that the modification be classified as a Class 1 or Class 2 modification, he or she must provide the Department with the necessary information to support the requested classification.

(2) The Department shall make the determination described in paragraph (d)(1) of this section as promptly as practicable. In determining the appropriate class for a specific modification, the Department shall consider the similarity of the modification to other modifications codified in Appendix I and the following criteria:

(i) Class 1 modifications apply to minor changes that keep the permit current with routine changes to the facility or its operation. These changes do not substantially alter the permit conditions or reduce the ability of the facility to protect human health or the environment. In the case of Class 1 modifications, the Department may require prior approval.

(ii) Class 2 modifications apply to changes that are necessary to enable a permittee to respond, in a timely manner, to:

(A) Common variations in the types and quantities of the wastes managed under the facility permit.

(B) Technological advancements, and

(C) Changes necessary to comply with new regulations, where these changes can be implemented without substantially changing design specifications or management practices in the permit.

(iii) Class 3 modifications substantially alter the facility or its operation.

(e) Temporary authorizations.

(1) Upon request of the permittee, the Department may, without prior public notice and comment, grant the permittee a temporary authorization in accordance with this subsection. Temporary authorizations must have a term of not more than 180 days.

(2)(i) The permittee may request a temporary authorization for:

(A) Any Class 2 modification meeting the criteria in paragraph (e)(3)(ii) of this section, and

(B) Any Class 3 modification that meets the criteria in paragraph (3)(ii)(A) or (B) of this section; or that meets the criteria in paragraphs (3)(ii)(C) through (E) of this section and provides improved management or treatment of a hazardous waste already listed in the facility permit.

(ii) The temporary authorization request must include:

(A) A description of the activities to be conducted under the temporary authorization;

(B) An explanation of why the temporary authorization is necessary; and

(C) Sufficient information to ensure compliance with Part 264 standards.

(iii) The permittee must send a notice about the temporary authorization request to all persons on the facility mailing list maintained by the Department and to appropriate units of State and local governments as specified in 124.10(c). This notification must be made within seven days of submission of the authorization request.

(3) The Department shall approve or deny the temporary authorization as quickly as practical. To issue a temporary authorization, the Department must find:

(i) The authorized activities are in compliance with the standards of Part 264.

(ii) The temporary authorization is necessary to achieve one of the following objectives before action is likely to be taken on a modification request:

(A) To facilitate timely implementation of closure or corrective action activities;

(B) To allow treatment or storage in tanks or containers, or in containment buildings in accordance with Part 268;

(C) To prevent disruption of ongoing waste management activities;

(D) To enable the permittee to respond to sudden changes in the types or quantities of the wastes managed under the facility permit; or

(E) To facilitate other changes to protect human health and the environment.

(4) A temporary authorization may be reissued for one additional term of up to 180 days provided that the permittee has requested a Class 2 or 3 permit modification for the activity covered in the temporary authorization, (12/94, 6/97) and:

(i) The reissued temporary authorization constitutes the Department's decision on a Class 2 permit modification in accordance with paragraph (b)(6)(i)(D) or (ii)(D) of this section, or

(ii) The Department determines that the reissued temporary authorization involving a Class 3 permit modification request is warranted to allow the authorized activities to continue while the modification procedures of paragraph (c) of this section are conducted.

(f) Public notice and appeals of permit modification decisions.

(1) The Department shall notify persons on the facility mailing list and appropriate units of State and local government within 10 days of any decision under this section to grant or deny a Class 2 or 3 permit modification request. The Department shall also notify such persons within 10 days after an automatic authorization for a Class 2 modification goes into effect under 270.42(b)(6)(iii) or (v).

(2) The Department's decision to grant or deny a Class 2 or 3 permit modification request under this section may be appealed under the permit appeal procedures described in 124.19.

(3) An automatic authorization that goes into effect under 270.42(b)(6)(iii) or (v) may be appealed under the permit appeal procedures described in 124.19; however, the permittee may continue to conduct the activities pursuant to the automatic authorization until the appeal has been granted pursuant to 124.19, notwithstanding the provisions of 124.15(b).

(g) Newly regulated wastes and units. (revised 5/93)

(1) The permittee is authorized to continue to manage wastes listed or identified as hazardous under R.61-79.261 or to continue to manage hazardous waste in units newly regulated as hazardous waste management units, if:

(i) The unit was in existence as a hazardous waste facility with respect to the newly listed or characterized waste or newly regulated waste management unit on the effective date of the final rule listing or identifying the waste, or regulating the unit;

(ii) The permittee submits a Class 1 modification request on or before the date on which the waste or unit becomes subject to the new requirements;

(iii) The permittee is in compliance with the applicable standards of Part 265 and 266;

(iv) The permittee also submits a complete Class 2 or 3 permit modification request within 180 days of the effective date of the rule listing or identifying the waste, or subjecting the unit to RCRA Subtitle C management standards; (revised 12/93)

(v) In the case of land disposal units, the permittee certifies that each such unit is in compliance with all applicable requirements of R.61-79.265 for groundwater monitoring and financial responsibility on the date 12 months after the effective date of the rule identifying or listing the waste as

hazardous, or regulating the unit as a hazardous waste management unit. If the owner or operator fails to certify compliance with all these requirements, he or she will lose authority to operate under this section. (revised 12/93)

(vi) As of December 25, 1992, any facility which fails to meet the federal requirements for a Class 1 permit modification request to continue to manage a newly regulated waste code promulgated pursuant to HSWA or to continue to manage hazardous waste in newly regulated units promulgated pursuant to HSWA shall also be denied the Class 1 modification request to continue to conduct such activity under State law.

(2) [Reserved]

(h) Military hazardous waste munitions treatment and disposal. The permittee is authorized to continue to accept waste military munitions notwithstanding any permit conditions barring the permittee from accepting off-site wastes, if:

(1) The facility was in existence as a hazardous waste facility, and the facility was already permitted to handle the waste military munitions, on the date when the waste military munitions became subject to hazardous waste regulatory requirements;

(2) On or before the date when the waste military munitions become subject to hazardous waste regulatory requirements, the permittee submits a Class 1 modification request to remove or amend the permit provision restricting the receipt of off-site waste munitions; and

(3) The permittee submits a complete Class 2 modification request within 180 days of the date when the waste military munitions became subject to hazardous waste regulatory requirements.

(i) Permit modification list. The Department must maintain a list of all approved permit modifications and must publish a notice once a year in a State-wide newspaper that an updated list is available for review.

(j) Combustion facility changes to meet 40 CFR part 63 MACT standards. The following procedures apply to hazardous waste combustion facility permit modifications requested under Appendix I of this section, section L(9).

(1) Facility owners or operators must have complied with the Notification of Intent to Comply (NIC) requirements of 40 CFR 63.1210 that were in effect prior to Oct 11, 2000 (see 40 CFR 63.1200–63.1499 revised as of July 1, 2000), in order to request a permit modification under this section for the purpose of technology changes needed to meet the standards under 40 CFR 63.1203, 63.1204, and 63.1205.

(2) Facility owners or operators must comply with the Notification of Intent to Comply (NIC) requirements of 40 CFR 63.1210(b) and 63.1212(a) before a permit modification can be requested under this section for the purpose of technology changes needed to meet the 40 CFR 63.1215, 63.1216, 63.1217, 63.1218, 63.1219, 63.1220, and 63.1221 standards promulgated on October 12, 2005.

(3) If the Department does not approve or deny the request within 90 days of receiving it, the request shall be deemed approved. The Department may, at its discretion, extend this 90 day deadline one time for up to 30 days by notifying the facility owner or operator.

(k)(1) Waiver of RCRA permit conditions in support of transition to the 40 CFR part 63 MACT standards. (1) You may request to have specific RCRA operating and emissions limits waived by submitting a Class 1 permit modification request under Appendix I of this section, section L(10). You must:

(i) Identify the specific RCRA permit operating and emissions limits which you are requesting to waive;

(ii) Provide an explanation of why the changes are necessary in order to minimize or eliminate conflicts between the RCRA permit and MACT compliance; and

(iii) Discuss how the revised provisions will be sufficiently protective.

(iv) The Department shall approve or deny the request within 30 days of receipt of the request. The Department may extend this 30 day deadline one time for up to 30 days by notifying the facility owner or operator.

(2) To request this modification in conjunction with MACT performance testing where permit limits may only be waived during actual test events and pretesting, as defined under 40 CFR 63.1207(h)(2)(i) and (ii), for an aggregate time not to exceed 720 hours of operation (renewable at the discretion of the Department) you must:

(i) Submit your modification request to the Director at the same time you submit your test plans to the Administrator; and

(ii) The Department may elect to approve or deny the request contingent upon approval of the test plans.

(l) [Reserved]

Appendix I to 270.42—Classification of Permit Modification

Modifications	Class
A. General Permit Provisions	
1. Administrative and informational changes	1
2. Correction of typographical errors	1
3. Equipment replacement or upgrading with functionally equivalent components (e.g., pipes, valves, pumps, conveyors, controls)	1
4. Changes in the frequency of or procedures for monitoring, reporting, sampling, or maintenance activities by the permittee:	
a. To provide for more frequent monitoring, reporting, sampling, or maintenance.	1
b. Other changes.	2
5. Schedule of compliance:	
a. Changes in interim compliance dates, with prior approval of the Department.	11
b. Extension of final compliance date.	3
6. Changes in expiration date of permit to allow earlier permit termination, with prior approval of the Department.	11
7. Changes in ownership or operational control of a facility, provided the procedures of 270.40(b) are followed.	11
8. Changes to remove permit conditions that are no longer applicable (i.e., because the standards upon which they are based are no longer applicable to the facility).	11
B. General Facility Standards	
1. Changes to waste sampling or analysis methods:	
a. To conform with agency guidance or regulations.	1
b. To incorporate changes associated with F039 (multi-source leachate) sampling or analysis methods.	1
c. To incorporate changes associated with underlying hazardous constituents in ignitable or corrosive wastes. (added 12/93)	11
d. Other changes. (moved 12/93)	2
2. Changes to analytical quality assurance/control plan:	
a. To conform with agency guidance or regulations.	1
b. Other changes	2
3. Changes in procedures for maintaining the operating record.	11
4. Changes in frequency or content of inspection schedules.	2
5. Changes in the training plan:	
a. That affect the type or decrease the amount of training given to employees.	2
b. Other changes.	1
6. Contingency plan:	
a. Changes in emergency procedures (i.e., spill or release response procedures).	2
b. Replacement with functionally equivalent equipment, upgrade, or relocate emergency equipment listed.	1
c. Removal of equipment from emergency equipment list.	2
d. Changes in name, address, or phone number of coordinators or other persons or agencies identified in the plan.	1
7. Construction quality assurance plan: (added 12/93)	
a. Changes that the CQA officer certifies in the operating record will provide equivalent or better certainty that the unit components meet the design specifications.	1
b. Other changes.	2
<p>Note: When a permit modification (such as introduction of a new unit) requires a change in facility plans or other general facility standards, that change shall be reviewed under the same procedures as the permit modification.</p>	
C. Groundwater Protection	
1. Changes to wells:	
a. Changes in the number, location, depth, or design of upgradient or downgradient wells of permitted groundwater monitoring system.	2

Modifications	Class
C. Groundwater Protection	
b. Replacement of an existing well that has been damaged or rendered inoperable, without change to location, design, or depth of the well.	1
2. Changes in groundwater sampling or analysis procedures or monitoring schedule, with prior approval of the Department.	11
3. Changes in statistical procedure for determining whether a statistically significant change in groundwater quality between upgradient and downgradient wells has occurred, with prior approval of the Department.	11
4. Changes in point of compliance.	2
5. Changes in indicator parameters, hazardous constituents, or concentration limits (including ACLs):	
a. As specified in the groundwater protection standard.	3
b. As specified in the detection monitoring program.	2
6. Changes to a detection monitoring program as required by 264.98(h), unless otherwise specified in this appendix.	2
7. Compliance monitoring program:	
a. Addition of compliance monitoring program as required by 264.98(g)(4) and 264.99.	3
b. Changes to a compliance monitoring program as required by 264.99(j), unless otherwise specified in this appendix.	2
8. Corrective action program:	
a. Addition of a corrective action program as required by 264.99(h)(2) and 264.100.	3
b. Changes to a corrective action program as required by 264.100(h), unless otherwise specified in this Appendix.	2
D. Closure.	
1. Changes to the closure plan:	
a. Changes in estimate of maximum extent of operations or maximum inventory of waste onsite at any time during the active life of the facility, with prior approval of the Department.	11
b. Changes in the closure schedule for any unit, changes in the final closure schedule for the facility, or extension of the closure period, with prior approval of the Department.	11
c. Changes in the expected year of final closure, where other permit conditions are not changed, with prior approval of the Department.	11
d. Changes in procedures for decontamination of facility equipment or structures, with prior approval of the Department.	11
e. Changes in approved closure plan resulting from unexpected events occurring during partial or final closure, unless otherwise specified in this appendix.	2
f. Extension of the closure period to allow a landfill, surface impoundment or land treatment unit to receive nonhazardous wastes after final receipt of hazardous wastes under 264.113(d) and (e).	2
2. Creation of a new landfill unit as part of closure.	3
3. Addition of the following new units to be used temporarily for closure activities:	
a. Surface impoundments.	3
b. Incinerators.	3
c. Waste piles that do not comply with 264.250(c).	3
d. Waste piles that comply with 264.250(c).	2
e. Tanks or containers (other than specified below).	2
f. Tanks used for neutralization, dewatering, phase separation, or component separation, with prior approval of the Department.	11
g. Staging piles	2
E. Postclosure	
1. Changes in name, address, or phone number of contact in postclosure plan.	1
2. Extension of postclosure care period.	2
3. Reduction in the postclosure care period.	3
4. Changes to the expected year of final closure, where other permit conditions are not changed.	1

Modifications	Class
E. Postclosure	
5. Changes in postclosure plan necessitated by events occurring during the active life of the facility, including partial and final closure.	2
F. Containers	
1. Modification or addition of container units:	
a. Resulting in an increase in the facility's container storage capacity.	3
b. Not resulting in an increase in the facility's container storage capacity.	2
2:	
a. Modification of a container unit without increasing the capacity of the unit.	2
b. Addition of a roof to a container unit without alteration of the containment system.	11
3. Storage of different wastes in containers:	
a. That require additional or different management practices from those authorized in the permit.	3
b. That do not require additional or different management practices from those authorized in the permit.	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
G. Tanks	
1:	
a. Modification or addition of tank units resulting in an increase in the facility's tank capacity.	3
b. Modification or addition of tank units not resulting in an increase in the facility's tank capacity.	2
c. Addition of a new tank that will operate for more than 90 days using any of the following physical or chemical treatment technologies: neutralization, dewatering, phase separation, or component separation.	3
d. After prior approval of the Department, addition of a new tank that will operate for up to 90 days using any of the following physical or chemical treatment technologies: neutralization, dewatering, phase separation, or component separation.	3
2. Modification of a tank unit or secondary containment system without increasing the capacity of the unit.	2
3. Replacement of a tank with a tank that meets the same design standards and has a capacity less than or equal to the capacity of the replaced tank provided.	11
– The capacity difference is no more than 1500 gallons,	
– The replacement tank meets the same conditions in the permit.	
4. Modification of a tank management practice.	2
5. Management of different wastes in tanks:	
a. That require additional or different management practices, tank design, different fire protection specifications, or significantly different tank treatment process from the authorized in the permit.	3
b. That do not require additional or different management practices, tank design, different fire protection specifications, or significantly different tank treatment process than authorized in the permit.	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
H. Surface Impoundments	
1. Modification or addition of surface impoundment units that result in increasing the facility's surface impoundment storage or treatment capacity.	3
2. Replacement of a surface impoundment unit.	3
3. Modification of a surface impoundment unit without increasing the facility's surface impoundment storage or treatment capacity and without modifying the unit's liner, leak detection system, or leachate collection system.	2
4. Modification of a surface impoundment management practice.	2
5. Treatment, storage, or disposal of different wastes in surface impoundments:	

Modifications	Class
H. Surface Impoundments	
a. That require additional or different management practices or different design of the liner or leak detection system than authorized in the permit.	3
b. That do not require additional or different management practices or different design of the liner or leak detection system than authorized in the permit.	2
6. Modifications of unconstructed units to comply with 264.221(c), 264.222, 264.223, and 264.226(d). (added 12/93)	11
7. Changes in response action plan: (added 12/93)	
a. Increase in action leakage rate.	3
b. Change in a specific response reducing its frequency or effectiveness.	3
c. Other changes.	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
I. Enclosed Waste Piles. For all waste piles except those complying with 264.250(c), modifications are treated the same as for a landfill. The following modifications are applicable only to waste piles complying with 264.250(c).	
1. Modification or addition of waste pile units:	
a. Resulting in an increase in the facility's waste pile storage or treatment capacity.	3
b. Not resulting in an increase in the facility's waste pile storage or treatment capacity.	2
2. Modification of waste pile unit without increasing the capacity of the unit.	2
3. Replacement of a waste pile unit with another waste pile unit of the same design and capacity and meeting all waste pile conditions in the permit.	11
4. Modification of a waste pile management practice.	2
5. Storage or treatment of different wastes in waste piles:	
a. That require additional or different management practices or different design of the unit.	3
b. That do not require additional or different management practices or different design of the unit.	2
6. Conversion of an enclosed waste pile to a containment building unit. (added 12/93)	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
J. Landfills and Unenclosed Waste Piles	
1. Modification or addition of landfill units that result in increasing the facility's disposal capacity.	3
2. Replacement of a landfill.	3
3. Addition or modification of a liner, leachate collection system, leachate detection system, run-off control, or final cover system.	3
4. Modification of a landfill unit without changing a liner, leachate collection system, leachate detection system, run-off control, or final cover system.	2
5. Modification of a landfill management practice.	2
6. Landfill different wastes:	
a. That require additional or different management practices, different design of the liner, leachate collection system, or leachate detection system.	3
b. That do not require additional or different management practices, different design of the liner, leachate collection system, or leachate detection system.	2
7. Modifications of unconstructed units to comply with 264.251(c), 264.252, 264.253, 264.254(c), 264.301(c), 264.302, 264.303(c), and 364.304. (added 12/93)	11
8. Changes in response action plan: (added 12/93)	
a. Increase in action leakage rate.	3
b. Change in a specific response reducing its frequency or effectiveness.	3
c. Other changes.	2

Modifications	Class
J. Landfills and Unenclosed Waste Piles	
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
K. Land Treatment	
1. Lateral expansion of or other modification of a land treatment unit to increase areal extent.	3
2. Modification of run-on control system.	2
3. Modify run-off control system.	3
4. Other modifications of land treatment unit component specifications or standards required in permit.	2
5. Management of different wastes in land treatment units:	
a. That require a change in permit operating conditions or unit design specifications.	3
b. That do not require a change in permit operating conditions or unit design specifications.	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
6. Modification of a land treatment unit management practice to:	
a. Increase rate or change method of waste application.	3
b. Decrease rate of waste application.	1
7. Modification of a land treatment unit management practice to change measures of pH or moisture content, or to enhance microbial or chemical reactions.	2
8. Modification of a land treatment unit management practice to grow food chain crops, to add to or replace existing permitted crops with different food chain crops, or to modify operating plans for distribution of animal feeds resulting from such crops.	3
9. Modification of operating practice due to detection of releases from the land treatment unit pursuant to 264.278(g)(2).	3
10. Changes in the unsaturated zone monitoring system, resulting in a change to the location, depth, number of sampling points, or replace unsaturated zone monitoring devices or components of devices with devices or components that have specifications different from permit requirements.	3
11. Changes in the unsaturated zone monitoring system that do not result in a change to the location, depth, number of sampling points, or that replace unsaturated zone monitoring devices or components of devices with devices or components having specifications different from permit requirements.	2
12. Changes in background values for hazardous constituents in soil and soil-pore liquid.	2
13. Changes in sampling, analysis, or statistical procedure.	2
14. Changes in land treatment demonstration program prior to or during the demonstration.	2
15. Changes in any condition specified in the permit for a land treatment unit to reflect results of the land treatment demonstration, provided performance standards are met, and the Department's prior approval has been received.	11
16. Changes to allow a second land treatment demonstration to be conducted when the results of the first demonstration have not shown the conditions under which the wastes can be treated completely, provided the conditions for the second demonstration are substantially the same as the conditions for the first demonstration and have received the prior approval of the Department.	11
17. Changes to allow a second land treatment demonstration to be conducted when the results of the first demonstration have not shown the conditions under which the wastes can be treated completely, where the conditions for the second demonstration are not substantially the same as the conditions for the first demonstration.	3
18. Changes in vegetative cover requirements for closure.	2
L. Incinerators, Boilers, and Industrial Furnaces:	
1. Changes to increase any of the following limits authorized in the permit: A thermal feed rate limit, a feedstream feed rate limit, a chlorine/chloride feed rate limit, a metal feed rate limit, or an ash feed	

Modifications	Class
L. Incinerators, Boilers, and Industrial Furnaces:	
rate limit. The Department will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.	3
2. [Reserved]	
3. Modification of an incinerator, boiler, or industrial furnace unit by changing the internal size or geometry of the primary or secondary combustion units, by adding a primary or secondary combustion unit, by substantially changing the design of any component used to remove HCl/Cl ₂ , metals, or particulate from the combustion gases, or by changing other features of the incinerator, boiler, or industrial furnace that could affect its capability to meet the regulatory performance standards. The Department will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.	3
4. Modification of an incinerator, boiler, or industrial furnace unit in a manner that would not likely affect the capability of the unit to meet the regulatory performance standards but which would change the operating conditions or monitoring requirements specified in the permit. The Department may require a new trial burn to demonstrate compliance with the regulatory performance standards.	2
5. Operating requirements:	
a. Modification of the limits specified in the permit for minimum or maximum combustion gas temperature, minimum combustion gas residence time, oxygen concentration in the secondary combustion chamber, flue gas carbon monoxide and hydrocarbon concentration, maximum temperature at the inlet to the particulate matter emission control system, or operating parameters for the air pollution control system. The Department will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.	3
b. Modification of any stack gas emission limits specified in the permit, or modification of any conditions in the permit concerning emergency shutdown or automatic waste feed cutoff procedures or controls.	3
c. Modification of any other operating condition or any inspection or recordkeeping requirement specified in the permit.	2
6. Burning different wastes:	
a. If the waste contains a POHC that is more difficult to burn than authorized by the permit or if burning of the waste requires compliance with different regulatory performance standards than specified in the permit. The Department will require a new trial burn to substantiate compliance with the regulatory performance standards unless this demonstration can be made through other means.	3
b. If the waste does not contain a POHC that is more difficult to burn than authorized by the permit and if burning of the waste does not require compliance with different regulatory performance standards than specified in the permit.	2
Note: See 270.42(g) for modification procedures to be used for the management of newly listed or identified wastes.	
7. Shakedown and trial burn:	
a. Modification of the trial burn plan or any of the permit conditions applicable during the shakedown period for determining operational readiness after construction, the trial burn period, or the period immediately following the trial burn.	2
b. Authorization of up to an additional 720 hours of waste burning during the shakedown period for determining operational readiness after construction, with the prior approval of the Department.	11
c. Changes in the operating requirements set in the permit for conducting a trial burn, provided the change is minor and has received the prior approval of the Department.	11

Modifications	Class
L. Incinerators, Boilers, and Industrial Furnaces:	
d. Changes in the ranges of the operating requirements set in the permit to reflect the results of the trial burn, provided the change is minor and has received the prior approval of the Department.	1 ¹
8. Substitution of an alternative type of nonhazardous waste fuel that is not specified in the permit. (revised 12/93) ¹	1
9. Technology changes needed to meet standards under 40 CFR part 63 (Subpart EEE-Hazardous Air Pollutants From Hazardous Waste Combustors), provided the procedures of 270.42(j) are followed.	
10. Changes to RCRA permit provisions needed to support transition to 40 CFR part 63 (Subpart EEE—National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors), provided the procedures of Sec. 270.42(k) are followed.	2 ¹
M. Containment Buildings: (added 12/93)	
1. Modification or addition of containment building units:	
a. Resulting in an increase in the facility's containment building storage or treatment capacity.	3
b. Not resulting in an increase in the facility's containment building storage or treatment capacity.	2
2. Modification of a containment building unit or secondary containment system without increasing the capacity of the unit.	2
3. Replacement of a containment building with a containment building that meets the same design standards provided:	
a. The unit capacity is not increased.	1 ¹
b. The replacement containment building meets the same conditions in the permit.	1 ¹
4. Modification of a containment building management practice.	2
5. Storage or treatment of different wastes in containment buildings:	
a. That require additional or different management practices.	3
b. That did not require additional or different management practices.	2
N. Corrective Action:	
1. Approval of a corrective action management unit pursuant to 264.552.	3
2. Approval of a temporary unit or time extension for a temporary unit pursuant to 264.553.	2
3. Approval of a staging pile or staging pile operating term extension pursuant to 264.554	2
O. Burden Reduction	
1. [Reserved]	
2. Development of one contingency plan based on Integrated Contingency Plan Guidance pursuant to 264.52(b)	1
3. Changes to recordkeeping and reporting requirements pursuant to: 264.56(i), 264.343(a)(2), 264.1061(b)(1),(d), 264.1062(a)(2), 264.196(f), 264.100(g), and 264.113(e)(5)	1
4. Changes to inspection frequency for tank systems pursuant to 264.195(b)	1
5. Changes to detection and compliance monitoring program pursuant to 264.98(d), (g)(2), and (g)(3), 264.99(f), and (g)	1

¹ Class 1 Modifications requiring prior Department approval.

² Class 1 modifications requiring prior Agency approval.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 17, Issue No. 5, Part II, eff May 28, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 18, Issue No. 12, eff December 23, 1994; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 25, Issue No. 10, eff October 26, 2001; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 3, eff March 23, 2012; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 43-5 Doc. No. 4841, eff May 24, 2019; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.43. Termination of permits.

(a) The following are causes for terminating a permit during its term, or for denying a permit renewal application:

- (1) Noncompliance by the permittee with any condition of the permit;
- (2) The permittee's failure in the application or during the permit issuance process to disclose fully all relevant facts, or the permittee's misrepresentation of any relevant facts at any time; or
- (3) A determination that the permitted activity endangers human health or the environment and can only be regulated to acceptable levels by permit modification or termination.
- (4) Violation of any applicable requirement of the Hazardous Waste Management Act or of these Regulations promulgated pursuant to the Act; or
- (5) Aiding, abetting, or permitting the violation of any provisions of the Hazardous Waste Management Act or any regulation pursuant to the Act.

(b) The Department shall follow the applicable procedures in R.61-79.124 in terminating any permit under this section.

SUBPART E

Expiration and Continuation of Permits

270.50. Duration of permits.

(a) Permits issued under these regulations shall be effective for a fixed term not to exceed 10 years for facilities and not to exceed 3 years for transporters.

(b) Except as provided in Section 270.51, the term of a permit shall not be extended by modification beyond the maximum duration specified in this section.

(c) The Department may issue any permit for a duration that is less than the full allowable term under this section.

(d) Each permit for a land disposal facility shall be reviewed by the Department five years after the date of permit issuance or reissuance and shall be modified as necessary as provided in 270.41.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 19, Issue No. 6, eff June 23, 1995; State Register Volume 21, Issue No. 6, Part 2, eff June 27, 1997.

270.51. Continuation of expiring permits.

(a) The conditions of an expired permit continue in force until the effective date of a new permit (see 124.15) if:

(1) The permittee has submitted a timely application under Section 270.14 and the applicable sections in Sections 270.15 through 270.29 which is a complete (under Section 270.10(c)) application for a new permit; and

(2) The Department through no fault of the permittee, does not issue a new permit with an effective date under R.61-79.124.15 on or before the expiration date of the previous permit (for example, when issuance is impracticable due to time or resource constraints).

(b) Effect. Permits continued under this section remain fully effective and enforceable.

(c) Enforcement. When the permittee is not in compliance with the conditions of the expiring or expired permit, the Department may choose to do any or all of the following:

(1) Initiate enforcement action based upon the permit which has been continued;

(2) Issue a notice of intent to deny the new permit under R.61-79.124.6. If the permit is denied, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operating without a permit;

(3) Issue a new permit under R.61-79.124 with appropriate conditions; or

(4) Take other actions authorized by these regulations.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

SUBPART F
Special Forms of Permits

270.60. Permits by rule.

Notwithstanding any other provision of this part or R.61-79.124, the following shall be deemed to have a permit under these regulations if the conditions listed are met:

(a) Ocean disposal barges or vessels. The owner or operator of a barge or other vessel which accepts hazardous waste for ocean disposal, if the owner or operator:

- (1) Has a permit for ocean dumping issued under 40 CFR Part 220 (Ocean Dumping, authorized by the Marine Protection, Research, and Sanctuaries Act, as amended, 33 U.S.C. 1420 et seq.);
- (2) Complies with the conditions of that permit; and
- (3) Complies with the following hazardous waste regulations:
 - (i) R.61-79.264.11, Identification number;
 - (ii) R.61-79.264.71, Use of manifest system;
 - (iii) R.61-79.264.72, Manifest discrepancies;
 - (iv) R.61-79.264.73(a) and (b)(1), Operating record;
 - (v) R.61-79.264.75, Quarterly report; and
 - (vi) R.61-79.264.76, Unmanifested waste report.

(b) Injection wells. The owner or operator of an injection well disposing of hazardous waste, if the owner or operator:

- (1) Has a permit for underground injection issued under R.61-87 Underground Injection Control Regulations; and
- (2) Complies with the conditions of that permit;
- (3) Complies with R.61-79.264.101.

(c) Publicly owned treatment works. The owner or operator of a POTW which accepts for treatment hazardous waste, if the owner or operator:

- (1) Has an NPDES permit;
- (2) Complies with the conditions of that permit; and
- (3) Complies with the following regulations:
 - (i) R.61-79.264.11, Identification number;
 - (ii) R.61-79.264.71, Use of manifest system;
 - (iii) R.61-79.264.72, Manifest discrepancies;
 - (iv) R.61-79.264.73 (a), and (b)(1), Operating record;
 - (v) R.61-79.264.75 Quarterly report;
 - (vi) R.61-79.264.76, Unmanifested waste report; and
 - (vii) Complies with R.61-79.264.101; and
- (4) If the waste meets all Federal, State, and local pretreatment requirements which would be applicable to the waste if it were being discharged into the POTW through a sewer, pipe, or similar conveyance.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993.

270.61. Emergency permits.

(a) Notwithstanding any other provision of this part or R.61-79.124 in the event the Department finds an imminent and substantial endangerment to human health or the environment the Department may issue a temporary emergency permit: To a non-permitted facility to allow treatment, storage, or

disposal of hazardous waste or (2) to a permitted facility to allow treatment, storage, or disposal of a hazardous waste not covered by an effective permit.

(b) This emergency permit:

- (1) May be oral or written. If oral, it will be followed in five days by a written emergency permit;
- (2) Will not exceed 90 days in duration;
- (3) Will clearly specify the hazardous wastes to be received, and the manner and location of their treatment, storage, or disposal;
- (4) May be terminated by the Department at any time without process if it determines that termination is appropriate to protect human health and the environment;
- (5) Shall be accompanied by a public notice published under R.61-79.124.10 including:
 - (i) Name and address of the office granting the emergency authorization;
 - (ii) Name and location of the permitted HWM facility;
 - (iii) A brief description of the wastes involved;
 - (iv) A brief description of the action authorized and reasons for authorizing it; and
 - (v) Duration of the emergency permit; and
- (6) Shall incorporate, to the extent possible and not inconsistent with the emergency situation, all applicable requirements of this part and parts 264 and 266.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998.

270.62. Hazardous waste incinerator permits.

When an owner or operator of a hazardous waste incineration unit becomes subject to RCRA permit requirements after October 12, 2005, or when an owner or operator of an existing hazardous waste incineration unit demonstrates compliance with the air emission standards and limitations in 40 CFR part 63, Subpart EEE, (i.e., by conducting a comprehensive performance test and submitting a Notification of Compliance, under 63.1207(j) and 63.1210(d) documenting compliance with all applicable requirements of part 63 subpart EEE), the requirements do not apply, except those provisions the Department determines are necessary to ensure compliance with 264.345(a) and 264.345(c) if you elect to comply with 270.235(a)(1)(i) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events. Nevertheless, the Department may apply the provisions, on a case-by-case basis, for purposes of information collection in accordance with 270.10(k), 270.10(l), 270.32(b)(2), and 270.32(b)(3).

(a) For the purposes of determining operational readiness following completion of physical construction, the Department may establish permit conditions, including but not limited to allowable waste feeds and operating conditions in the permit to a new hazardous waste incinerator. These permit conditions will be effective for the minimum time required to bring the incinerator to a point of operational readiness sufficient to conduct a trial burn, not to exceed 720 hours operating time for treatment of hazardous waste. The Department may extend the duration of this operational period once, for up to 720 additional hours, at the request of the applicant when good cause is shown. The permit may be modified to reflect the extension according to Section 270.42 (Permit modifications at the request of the permittee).

(1) Applicants must submit a statement, with Part B of the permit application, which suggests the conditions necessary to operate in compliance with the performance standards of R.61-79.264.343 during this period. This statement should include, at a minimum, restrictions on waste constituents, waste feed rates and the operating parameters identified in R.61-79.264.345.

(2) The Department will review this statement and any other relevant information submitted with Part B of the permit application and specify requirements for this period sufficient to meet the performance standards of R.61-79.264.343 based on its engineering judgement.

(b) For the purposes of determining feasibility of compliance with the performance standards of R.61-79.264.343 and of determining adequate operating conditions under R.61-79.264.345, the

Department must establish conditions in the permit for a new hazardous waste incinerator to be effective during the trial burn.

(1) Applicants must propose a trial burn plan, prepared under paragraph (b)(2) of this Section with a Part B of the permit application.

(2) The trial burn plan must include the following information:

(i) An Analysis of each waste or mixture of wastes to be burned which includes:

(A) Heat value of the waste in the form and composition in which it will be burned.

(B) Viscosity (if applicable), or description of physical form of the waste.

(C) An identification of any hazardous organic constituents listed in R.61-79.261, Appendix VIII, which are present in the waste to be burned, except that the applicant need not analyze for constituents listed in R.61-79.261, Appendix VIII which would reasonably not be expected to be found in the waste. The constituents excluded from analysis must be identified, and the basis for the exclusion stated. The waste analysis must rely on analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in R.61-79.260.11 and § 270.6, or other equivalent.

(D) An approximate quantification of the hazardous constituents identified in the waste, within the precision produced by the analytical methods specified in "Test Methods for the Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in R.61-79.260.11 and § 270.6, or their equivalent.

(ii) A detailed engineering description of the incinerator for which the permit is sought including:

(A) Manufacturer's name and model number of incinerator (if available).

(B) Type of incinerator.

(C) Linear dimensions of the incinerator unit including the cross sectional area of combustion chamber.

(D) Description of the auxiliary fuel system (type/ feed).

(E) Capacity of prime mover.

(F) Description of automatic waste feed cut-off system(s).

(G) Stack gas monitoring and pollution control equipment.

(H) Nozzle and burner design.

(I) Construction materials.

(J) Location and description of temperature, pressure, and flow indicating and control devices.

(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.

(iv) A detailed test schedule for each waste for which the trial burn is planned including date(s), duration, quantity of waste to be burned, and other factors relevant to the Department decision under paragraph (b)(5) of this Section.

(v) A detailed test protocol, including, for each waste identified, the ranges of temperature, waste feed rate, combustion gas velocity, use of auxiliary fuel, and any other relevant parameters that will be varied to affect the destruction and removal efficiency of the incinerator.

(vi) A description of, and planned operating conditions for, any emission control equipment which will be used.

(vii) Procedures for rapidly stopping waste feed, shutting down the incinerator, and controlling emissions in the event of an equipment malfunction.

(viii) Such other information as the Department reasonably finds necessary to determine whether to approve the trial burn plan in light of the purposes of this paragraph and the criteria in paragraph (b)(5) of this section.

(3) The Department, in reviewing the trial burn plan, will evaluate the sufficiency of the information provided and may require the applicant to supplement this information, if necessary, to achieve the purposes of this paragraph.

(4) Based on the waste analysis data in the trial burn plan, the Department will specify as trial Principal Organic Hazardous Constituents (POHCs), those constituents for which destruction and removal efficiencies must be calculated during the trial burn. These trial POHCs will be specified by the Department based on its estimate of the difficulty of incineration of the constituents identified in the waste analysis, their concentration or mass in the waste feed, and, for wastes listed in R.61-79.261 Subpart D, the hazardous waste organic constituent or constituents identified in Appendix VII of that Part as the basis for listing.

(5) The Department will approve a trial burn plan if he finds that:

(i) The trial burn is likely to determine whether the incinerator performance standard required by R.61-79.264.343 can be met;

(ii) The trial burn itself will not present an imminent hazard to human health or the environment;

(iii) The trial burn will help the Department to determine operating requirements to be specified under R.61-79.264.345; and

(iv) The information sought in paragraphs (b)(5)(i) and (ii) of this Section cannot reasonably be developed through other means.

(6) The Department must send a notice to all persons on the facility mailing list as set forth in 124.10(c)(1)(iv) and to the appropriate units of State and local government as set forth in 124.10(c)(1)(v) announcing the scheduled commencement and completion dates for the trial burn. The applicant may not commence the trial burn until after the Department has issued such notice.

(i) This notice must be mailed within a reasonable time period before the scheduled trial burn. An additional notice is not required if the trial burn is delayed due to circumstances beyond the control of the facility or the permitting agency.

(ii) This notice must contain:

(A) The name and telephone number of the applicant's contact person;

(B) The name and telephone number of the permitting agency's contact office;

(C) The location where the approved trial burn plan and any supporting documents can be reviewed and copied; and

(D) An expected time period for commencement and completion of the trial burn.

(7) During each approved trial burn (or as soon after the burn as is practicable), the applicant must make the following determinations:

(i) A quantitative analysis of the trial POHCs in the waste feed to the incinerator.

(ii) A quantitative analysis of the exhaust gas for the concentration and mass emissions of the trial POHCs, oxygen (O₂) and hydrogen chloride (HCl).

(iii) A quantitative analysis of the scrubber water (if any), ash residues, and other residues, for the purpose of estimating the fate of the trial POHCs.

(iv) A computation of destruction and removal efficiency (DRE), in accordance with the DRE formula specified in R.61-79.264.343(a).

(v) If the HCl emission rate exceeds 1.8 kilograms of HCl per hour (4 pounds per hour), a computation of HCl removal efficiency in accordance with R.61-79.264.343(b).

(vi) A computation of particulate emissions, in accordance with R.61-79.264.343(c).

(vii) An identification of sources of fugitive emissions and their means of control.

(viii) A measurement of average, maximum, and minimum temperatures and combustion gas velocity.

(ix) A continuous measurement of carbon monoxide (CO) in the exhaust gas.

(x) Such other information as the Department may specify as necessary to ensure that the trial burn will determine compliance with the performance standards in R.61-79.264.343 and to

establish the operating conditions required by R.61-79.264.345 as necessary to meet that performance standard.

(8) The applicant must submit to the Department a certification that the trial burn has been carried out in accordance with the approved trial burn plan, and must submit the results of all the determinations required in paragraph (b)(6) above. This submission shall be made within 90 days of completion of the trial burn, or later if approved by the Department.

(9) All data collected during any trial burn must be submitted to the Department following the completion of the trial burn.

(10) All submissions required by this paragraph must be certified on behalf of the applicant by the signature of a person authorized to sign a permit application or a report under R.61-79.270.11.

(11) Based on the results of the trial burn, the Department will set the operating requirements in the final permit according to R.61-79.264.345. The permit modification shall proceed according to Section 270.42.

(c) For the purposes of allowing operation of a new hazardous waste incinerator following completion of the trial burn and prior to final modification of the permit conditions to reflect the trial burn results, the Department may establish permit conditions, including but not limited to allowable waste feeds and operating conditions sufficient to meet the requirements of R.61-79.264.345 in the permit of a new hazardous waste incinerator. These permit conditions will be effective for the minimum time required to complete sample analysis, data computation and submission of the trial burn results by the applicant, and modification of the facility permit by the Department.

(1) Applicants must submit a statement, with Part B of the permit application, which identifies the conditions necessary to operate in compliance with the performance standards of R.61-79.264.343 during this period. This statement should include, at a minimum, restrictions on waste constituents, waste feed rates, and the operating parameters in Section 264.345.

(2) The Department will review this statement and any other relevant information submitted with Part B of the permit application and specify those requirements for this period most likely to meet the performance standards of R.61-79.264.343 based on his engineering judgement.

(d) For the purpose of determining feasibility of compliance with the performance standards of 264.343 and of determining adequate operating conditions under 264.345, the applicant for a permit for an existing hazardous waste incinerator must prepare and submit a trial burn plan and perform a trial burn in accordance with 270.19(b) and paragraphs (b)(2) through (b)(5) and (b)(7) through (b)(10) of this section or, instead, submit other information as specified in 270.19(c). The Department must announce its intention to approve the trial burn plan in accordance with the timing and distribution requirements of paragraph (b)(6) of this section. The contents of the notice must include: the name and telephone number of a contact person at the facility; the name and telephone number of a contact office at the permitting Department; the location where the trial burn plan and any supporting documents can be reviewed and copied; and a schedule of the activities that are required prior to permit issuance, including the anticipated time schedule for Department approval of the plan and the time period during which the trial burn would be conducted. Applicants submitting information under 270.19(a) are exempt from compliance with 264.343 and 264.345 and, therefore, are exempt from the requirement to conduct a trial burn. Applicants who submit trial burn plans and receive approval before submission of a permit application must complete the trial burn and submit the results, specified in paragraph (b)(7) of this section, with part B of the permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Department to establish a later date for submission of the part B application or the trial burn results. Trial burn results must be submitted prior to issuance of the permit. When the applicant submits a trial burn plan with part B of the permit application, the Department will specify a time period prior to permit issuance in which the trial burn must be conducted and the results submitted. (11/90, 12/92, 12/93, 9/98, 11/99)

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 5, Part II, eff May 25, 1993; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 23, Issue No. 11, eff November 26, 1999; State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003;

State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008; State Register Volume 36, Issue No. 9, eff September 28, 2012; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.63. Permits for land treatment demonstrations using field test or laboratory analyses.

(a) For the purpose of allowing an owner or operator to meet the treatment demonstration requirements of R.61-79.264.272, the Department may issue a treatment demonstration permit. The permit will contain only those requirements necessary to meet the standards in R.61-79.264.272(c). The permit may be issued either as a treatment or disposal permit covering only the field test or laboratory analyses, or as a two-phase facility permit covering the field tests, or laboratory analyses, and design, construction, operation and maintenance of the land treatment unit.

(1) The Department may issue a two-phase facility permit if he finds that, based on information submitted in Part B of the application, substantial, although incomplete or inconclusive, information already exists upon which to base the issuance of a facility permit.

(2) If the Department finds that not enough information exists upon which he can establish permit conditions to attempt to provide for compliance with all of the requirements of Subpart M, it will issue a treatment demonstration permit covering only the field test or laboratory analysis.

(b) If the Department finds that a phased permit may be issued, it will establish, as requirements in the first phase of the facility permit, conditions for conducting the field tests or laboratory analyses. These permit conditions will include design and operating parameters (including the duration of the tests or analyses and in the case of field tests, the horizontal and vertical dimensions of the treatment zone), monitoring procedures, post-demonstration clean-up activities, and any other conditions which the Department finds may be necessary under R.61-79.264.272(c). The Department will include conditions in the second phase of the facility permit to attempt to meet all Subpart M requirements pertaining to unit design, construction, operation, and maintenance. The Department will establish these conditions in the second phase of the permit based upon the substantial but incomplete or inconclusive information contained in the Part B application.

(1) The first phase of the permit will be effective as provided in R.61-79.124.15(b).

(2) The second phase of the permit will be effective as provided in paragraph (d) of this section.

(c) When the owner or operator who has been issued a two-phase permit has completed the treatment demonstration, he must submit to the Department a certification, signed by a person authorized to sign a permit application or report under Section 270.11, that the field tests or laboratory analyses have been carried out in accordance with the conditions specified in phase one of the permit for conducting such tests or analyses. The owner or operator must also submit all data collected during the field tests or laboratory analyses within 90 days of completion of those tests or analyses unless the Department approves a later date.

(d) If the Department determines that the results of the field tests or laboratory analyses meet the requirements of R.61-79.264.272, it will modify the second phase of the permit to incorporate any requirements necessary for operation of the facility in compliance with R.61-79.264, Subpart M, based upon the results of the field tests or laboratory analyses.

(1) This permit modification may proceed under 270.42, or otherwise will proceed as a modification under Section 270.41(a)(2). If such modifications are necessary, the second phase of the permit will become effective only after those modifications have been made.

(2) If no modifications of the second phase of the permit are necessary, the Department will give notice of his final decision to the permit applicant and to each person who submitted written comments on the phased permit or who requested notice of final decision on the second phase of the permit. The second phase of the permit then will become effective as specified in R.61-79.124.15(b).

(3) If modifications under R.61-79.124.15(a)(2) are necessary, the second phase of the permit will become effective only after those modifications have been made.

HISTORY: Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990.

270.65. Research Development, and Demonstration Permits.

(a) The Department may issue a research, development, and demonstration permit for any hazardous waste treatment facility which propose to utilize an innovative and experimental hazardous waste

treatment technology or process for which permit standards for such experimental activity have not been promulgated under R.61-79.264 or R.61-79.266. Any such permit will include such terms and conditions as will assure protection of human health and the environment. Such permits:

- (1) Will provide for the construction of such facilities as necessary, and for operation of the facility for not longer than one year unless renewed as provided in paragraph (d) of this section, and
 - (2) Will provide for the receipt and treatment by the facility of only those types and quantities of hazardous waste which the Department deems necessary for purposes of determining the efficacy and performance capabilities of the technology or process and the effects of such technology or process on human health and the environment, and
 - (3) Will include such requirements as the Department deems necessary to protect human health and the environment (including, but not limited to, requirements regarding monitoring, operation, financial responsibility, closure, and remedial action), and such requirements as the Department deems necessary regarding testing and providing of information to the Department with respect to the operation of the facility.
- (b) For the purpose of expediting review and issuance of permits under this section, the Department may, consistent with the protection of human health and the environment, modify or waive permit application and permit issuance requirements in R.61-79.124 and R.61-79.270 except that there may be no modification or waiver of regulations regarding financial responsibility (including insurance) or of procedures regarding public participation.
- (c) The Department may order an immediate termination of all operations at the facility at any time it determines that termination is necessary to protect human health and the environment.
- (d) Any permit issued under this section may be renewed not more than three times. Each such renewal will be for a period of not more than 1 year. (amended 11/90)

HISTORY: Added by State Register Volume 10, Issue No. 1, eff January 24, 1986. Amended by State Register Volume 14, Issue No. 11, eff November 23, 1990; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

270.66. Permits for boilers and industrial furnaces burning hazardous waste.

When an owner or operator of a cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace becomes subject to RCRA permit requirements after October 12, 2005 or when an owner or operator of an existing cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace demonstrates compliance with the air emission standards and limitations in 40 CFR part 63, Subpart EEE, (i.e., by conducting a comprehensive performance test and submitting a Notification of Compliance under 63.1207(j) and 63.1210 (d) documenting compliance with all applicable requirements of part 63, subpart EEE), the requirements do not apply. The requirements of this section do apply, however, if the Department determines certain provisions are necessary to ensure compliance with 266.102(e)(1) and 266.102(e)(2)(iii) if you elect to comply with 270.235(a)(1)(i) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events; or if you are an area source and elect to comply with 266.105, 266.106, and 266.107 standards and associated requirements for particulate matter, hydrogen chloride and chlorine gas, and non-mercury metals; or the Department determines certain provisions apply, on a case-by-case basis, for purposes of information collection in accordance with 270.10(k), 270.10(l), 270.32(b)(2), and 270.32(b)(3).

(a) General. Owners and operators of new boilers and industrial furnaces (those not operating under the interim status standards of 266.103 of this chapter) are subject to paragraphs (b) through (f) of this section. Boilers and industrial furnaces operating under the interim status standards of 266.103 of this chapter are subject to paragraph (g) of this section.

(b) Permit operating periods for new boilers and industrial furnaces. A permit for a new boiler or industrial furnace shall specify appropriate conditions for the following operating periods:

- (1) Pretrial burn period. For the period beginning with initial introduction of hazardous waste and ending with initiation of the trial burn, and only for the minimum time required to bring the boiler or industrial furnace to a point of operational readiness to conduct a trial burn, not to exceed 720 hours operating time when burning hazardous waste, the Director must establish in the Pretrial Burn Period of the permit conditions, including but not limited to, allowable hazardous waste feed rates and operating conditions. The Director may extend the duration of this operational period

once, for up to 720 additional hours, at the request of the applicant when good cause is shown. The permit may be modified to reflect the extension according to 270.42.

(i) Applicants must submit a statement, with part B of the permit application, that suggests the conditions necessary to operate in compliance with the standards of 266.104 through 266.107 of this chapter during this period. This statement should include, at a minimum, restrictions on the applicable operating requirements identified in 266.102(e) of this chapter.

(ii) The Director will review this statement and any other relevant information submitted with part B of the permit application and specify requirements for this period sufficient to meet the performance standards of 266.104 through 266.107 of this chapter based on his/her engineering judgment.

(2) Trial burn period. For the duration of the trial burn, the Director must establish conditions in the permit for the purposes of determining feasibility of compliance with the performance standards of 266.104 through 266.107 of this chapter and determining adequate operating conditions under 266.102(e) of this chapter. Applicants must propose a trial burn plan, prepared under paragraph (c) of this section, to be submitted with part B of the permit application.

(3) Post-trial burn period.

(i) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, and submission of the trial burn results by the applicant, and review of the trial burn results and modification of the facility permit by the Director to reflect the trial burn results, the Director will establish the operating requirements most likely to ensure compliance with the performance standards of 266.104 through 266.107 of this chapter based on his engineering judgment.

(ii) Applicants must submit a statement, with part B of the application, that identifies the conditions necessary to operate during this period in compliance with the performance standards of 266.104 through 266.107 of this chapter. This statement should include, at a minimum, restrictions on the operating requirements provided by 266.102(e) of this chapter.

(iii) The Director will review this statement and any other relevant information submitted with part B of the permit application and specify requirements for this period sufficient to meet the performance standards of 266.104 through 266.107 of this chapter based on his/her engineering judgment.

(4) Final permit period. For the final period of operation, the Director will develop operating requirements in conformance with 266.102(e) of this chapter that reflect conditions in the trial burn plan and are likely to ensure compliance with the performance standards of 266.104 through 266.107 of this chapter. Based on the trial burn results, the Director shall make any necessary modifications to the operating requirements to ensure compliance with the performance standards. The permit modification shall proceed according to 270.42.

(c) Requirements for trial burn plans. The trial burn plan must include the following information. The Director, in reviewing the trial burn plan, shall evaluate the sufficiency of the information provided and may require the applicant to supplement this information, if necessary, to achieve the purposes of this paragraph:

(1) An analysis of each feed stream, including hazardous waste, other fuels, and industrial furnace feed stocks, as fired, that includes:

(i) Heating value, levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, thallium, total chlorine/chloride, and ash;

(ii) Viscosity or description of the physical form of the feed stream;

(2) An analysis of each hazardous waste, as fired, including:

(i) An identification of any hazardous organic constituents listed in appendix VIII, part 261, of this chapter that are present in the feed stream, except that the applicant need not analyze for constituents listed in appendix VIII that would reasonably not be expected to be found in the hazardous waste. The constituents excluded from analysis must be identified and the basis for this exclusion explained. The waste analysis must be conducted in accordance with analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA

Publication SW-846, as incorporated by reference in R.61-79.260.11 and 270.6, or their equivalent. (revised 12/93)

(ii) An approximate quantification of the hazardous constituents identified in the hazardous waste, within the precision produced by the analytical methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in R.61-79.260.11 and 270.6, or other equivalent. (revised 12/93)

(iii) A description of blending procedures, if applicable, prior to firing the hazardous waste, including a detailed analysis of the hazardous waste prior to blending, an analysis of the material with which the hazardous waste is blended, and blending ratios.

(3) A detailed engineering description of the boiler or industrial furnace, including:

(i) Manufacturer's name and model number of the boiler or industrial furnace;

(ii) Type of boiler or industrial furnace;

(iii) Maximum design capacity in appropriate units;

(iv) Description of the feed system for the hazardous waste, and, as appropriate, other fuels and industrial furnace feedstocks;

(v) Capacity of hazardous waste feed system;

(vi) Description of automatic hazardous waste feed cutoff system(s); (revised 12/93)

(vii) Description of any air pollution control system; and (revised 12/93)

(viii) Description of stack gas monitoring and any pollution control monitoring systems.

(4) 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.

(5) A detailed test schedule for each hazardous waste for which the trial burn is planned, including date(s), duration, quantity of hazardous waste to be burned, and other factors relevant to the Director's decision under paragraph (b)(2) of this section.

(6) A detailed test protocol, including, for each hazardous waste identified, the ranges of hazardous waste feed rate, and, as appropriate, the feed rates of other fuels and industrial furnace feedstocks, and any other relevant parameters that may affect the ability of the boiler or industrial furnace to meet the performance standards in 266.104 through 266.107 of this chapter.

(7) A description of, and planned operating conditions for, any emission control equipment that will be used.

(8) Procedures for rapidly stopping the hazardous waste feed and controlling emissions in the event of an equipment malfunction.

(9) Such other information as the Director reasonably finds necessary to determine whether to approve the trial burn plan in light of the purposes of this paragraph and the criteria in paragraph (b)(2) of this section.

(d) Trial burn procedures.

(1) A trial burn must be conducted to demonstrate conformance with the standards of 266.104 through 266.107 of this chapter under an approved trial burn plan.

(2) The Director shall approve a trial burn plan if he/she finds that:

(i) The trial burn is likely to determine whether the boiler or industrial furnace can meet the performance standards of 266.104 through 266.107 of this chapter;

(ii) The trial burn itself will not present an imminent hazard to human health and the environment;

(iii) The trial burn will help the Director to determine operating requirements to be specified under 266.102(e) of this chapter; and

(iv) The information sought in the trial burn cannot reasonably be developed through other means.

(3) The Department must send a notice to all persons on the facility mailing list as set forth in 124.10(c)(1)(iv) and to the appropriate units of State and local government as set forth in

124.10(c)(1)(v) announcing the scheduled commencement and completion dates for the trial burn. The applicant may not commence the trial burn until after the Department has issued such notice.

(i) This notice must be mailed within a reasonable time period before the trial burn. An additional notice is not required if the trial burn is delayed due to circumstances beyond the control of the facility or the permitting agency.

(ii) This notice must contain:

(A) The name and telephone number of applicant's contact person;

(B) The name and telephone number of the permitting agency contact office;

(C) The location where the approved trial burn plan and any supporting documents can be reviewed and copied; and

(D) An expected time period for commencement and completion of the trial burn.

(4) The applicant must submit to the Department a certification that the trial burn has been carried out in accordance with the approved trial burn plan, and must submit the results of all the determinations required in paragraph (c) of this section. This submission shall be made within 90 days of completion of the trial burn, or later if approved by the Department.

(5) All data collected during any trial burn must be submitted to the Department following completion of the trial burn.

(6) All submissions required by this paragraph must be certified on behalf of the applicant by the signature of a person authorized to sign a permit application or a report under 270.11.

(e) Special procedures for DRE trial burns. When a DRE trial burn is required under 266.104(a) of this chapter, the Director will specify (based on the hazardous waste analysis data and other information in the trial burn plan) as trial Principal Organic Hazardous Constituents (POHCs) those compounds for which destruction and removal efficiencies must be calculated during the trial burn. These trial POHCs will be specified by the Director based on information including his/her estimate of the difficulty of destroying the constituents identified in the hazardous waste analysis, their concentrations or mass in the hazardous waste feed, and, for hazardous waste containing or derived from wastes listed in part 261, subpart D of this chapter, the hazardous waste organic constituent(s) identified in Appendix VII of that part as the basis for listing.

(f) Determinations based on trial burn. During each approved trial burn (or as soon after the burn as is practicable), the applicant must make the following determinations:

(1) A quantitative analysis of the levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, thallium, silver, and chlorine/chloride, in the feed streams (hazardous waste, other fuels, and industrial furnace feedstocks);

(2) When a DRE trial burn is required under 266.104(a) of this chapter:

(i) A quantitative analysis of the trial POHCs in the hazardous waste feed;

(ii) A quantitative analysis of the stack gas for the concentration and mass emissions of the trial POHCs; and

(iii) A computation of destruction and removal efficiency (DRE), in accordance with the DRE formula specified in 266.104(a) of this chapter;

(3) When a trial burn for chlorinated dioxins and furans is required under 266.104(e) of this chapter, a quantitative analysis of the stack gas for the concentration and mass emission rate of the 2,3,7,8-chlorinated tetra-octa congeners of chlorinated dibenzo-p-dioxins and furans, and a computation showing conformance with the emission standard;

(4) When a trial burn for particulate matter, metals, or HCl/Cl₂ is required under 266.105, 266.106 (c) or (d), or 266.107 (b)(2) or (c) of this chapter, a quantitative analysis of the stack gas for the concentrations and mass emissions of particulate matter, metals, or hydrogen chloride (HCl) and chlorine (Cl₂), and computations showing conformance with the applicable emission performance standards;

(5) When a trial burn for DRE, metals, or HCl/Cl₂ is required under 266.104(a), 266.106 (c) or (d), or 266.107 (b)(2) or (c) of this chapter, a quantitative analysis of the scrubber water (if any), ash

residues, other residues, and products for the purpose of estimating the fate of the trial POHCs, metals, and chlorine/chloride;

(6) An identification of sources of fugitive emissions and their means of control;

(7) A continuous measurement of carbon monoxide (CO), oxygen, and where required, hydrocarbons (HC), in the stack gas; and

(8) Such other information as the Director may specify as necessary to ensure that the trial burn will determine compliance with the performance standards in 266.104 through 266.107 of this chapter and to establish the operating conditions required by 266.102(e) of this chapter as necessary to meet those performance standards.

(g) Interim status boilers and industrial furnaces. For the purpose of determining feasibility of compliance with the performance standards of 266.104 through 266.107 of this chapter and of determining adequate operating conditions under 266.103 of this chapter, applicants owning or operating existing boilers or industrial furnaces operated under the interim status standards of 266.103 must either prepare and submit a trial burn plan and perform a trial burn in accordance with the requirements of this section or submit other information as specified in 270.22(a)(6). The Department must announce its intention to approve of the trial burn plan in accordance with the timing and distribution requirements of paragraph (d)(3) of this section. The contents of the notice must include: the name and telephone number of a contact person at the facility; the name and telephone number of a contact office at the permitting agency; the location where the trial burn plan and any supporting documents can be reviewed and copied; and a schedule of the activities that are required prior to permit issuance, including the anticipated time schedule for agency approval of the plan and the time periods during which the trial burn would be conducted. Applicants who submit a trial burn plan and receive approval before submission of the part B permit application must complete the trial burn and submit the results specified in paragraph (f) of this section with the part B permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Department to establish a later date for submission of the part B application or the trial burn results. If the applicant submits a trial burn plan with part B of the permit application, the trial burn must be conducted and the results submitted within a time period prior to permit issuance to be specified by the Department.

HISTORY: Added by State Register Volume 17, Issue No. 12, eff December 24, 1993. Amended by State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003; State Register Volume 28, Issue No. 6, eff June 25, 2004; State Register Volume 32, Issue No. 6, eff June 27, 2008.

270.68. Remedial Action Plans (RAPs).

Remedial Action Plans (RAPs) are special forms of permits that are regulated under subpart H of this part.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

SUBPART G ***Interim Status***

270.70. Qualifying for interim status.

(a) Any person who owns or operates an "existing HWM facility" or a facility in existence on the effective date of statutory or regulatory amendments under the Act that render the facility subject to the requirement to have a permit under this regulation shall have interim status and shall be treated as having been issued a permit to the extent he or she has:

(1) Complied with the requirements of Section 44-56-120 of the S. C. Hazardous Waste Management Act pertaining to notification of hazardous waste activity and section 3010(a) of RCRA pertaining to notification of hazardous waste activity. (revised 12/92)

[Comment: Some existing facilities may not be required to file a notification under section 3010(a) of RCRA. These facilities may qualify for interim status by meeting paragraph (a)(2) of this section.](revised 12/92)

(2) Complied with the requirements of Section 270.10 governing submission of Part A applications;

(3) Conducted the facility activity on an ongoing basis prior to the effective date of the statutory or regulatory changes.

(b) Failure to qualify for interim status. If the Department has reason to believe upon examination of a Part A application that it fails to meet the requirements of Section 270.13 it shall notify the owner or operator in writing of the apparent deficiency. Such notice shall specify the grounds for the Department's belief that the application is deficient. The owner or operator shall have 30 days from receipt to respond to such a notification and to explain or cure the alleged deficiency in his Part A application. If, after such notification and opportunity for response, the Department determines that the application is deficient it may take appropriate enforcement action.

(c) Paragraph (a) of this section shall not apply to any facility which has been previously denied a permit or if authority to operate the facility under these regulations has been previously terminated.

(d) As of December 25, 1992, any facility which fails to qualify for federal interim status for a newly regulated waste code or a newly regulated waste management unit promulgated pursuant to HSWA or who lost interim status for failing to certify under HSWA for any newly promulgated waste code or waste management unit, is also denied interim status under State law (rule).

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993.

270.71. Operation during interim status.

(a) During the interim status period the facility shall not:

- (1) Treat, store, or dispose of hazardous waste not specified in Part A of the permit applications;
- (2) Employ processes not specified in Part A of the permit application; or
- (3) Exceed the design capacities specified in Part A of the permit application.

(b) Interim status standards. During interim status, owners or operators shall comply with the interim status standards R.61-79.265.

270.72. Changes during interim status.

(a) Except as provided in paragraph (b), the owner or operator of an interim status facility may make the following changes at the facility: (amended 11/90)

(1) Treatment, storage, or disposal of new hazardous wastes not previously identified in Part A of the permit application (and, in the case of newly listed or identified wastes, addition of the units being used to treat, store, or dispose of the hazardous wastes on the effective date of the listing or identification) if the owner or operator submits a revised Part A permit application prior to such treatment, storage, or disposal;

(2) Increases in the design capacity of processes used at the facility if the owner or operator submits a revised Part A permit application prior to such a change (along with justification explaining the need for the change) and the Department approves the changes because:

- (i) There is a lack of available treatment, storage, or disposal capacity at other hazardous waste management facilities, or
- (ii) The change is necessary to comply with a Federal, State, or local requirement.

(3) Changes in the processes for the treatment, storage, or disposal of hazardous waste or addition of processes if the owner or operator submits a revised Part A permit application prior to such change (along with a justification explaining the need for the change) and the Department approves the change because:

- (i) The change is necessary to prevent a threat to human health and the environment because of an emergency situation, or
- (ii) The change is necessary to comply with a Federal, State, or local requirement.

(4) Changes in the ownership or operational control of a facility if the new owner or operator submits a revised Part A permit application no later than 90 days prior to the scheduled change. When a transfer of operational control of a facility occurs, the old owner or operator shall comply with the requirements of Part 265 Subpart H (Financial Requirements), until the new owner or

operator has demonstrated to the Department he is complying with the requirements of that subpart. The new owner or operator must demonstrate compliance with Subpart H requirements within six months of the date of the change in ownership or operational control of the facility. Upon demonstration to the Department by the new owner or operator of compliance with Subpart H the Department shall notify the old owner or operator in writing that he no longer needs to comply with Subpart H as of the date of demonstration. All other interim status duties are transferred effective immediately upon the date of the change in ownership or operational control of the facility.

(5) Changes made in accordance with an interim status corrective action order under Section 44-56-140 or issued by EPA under section 3008(h) or other Federal authority, or by a court in a judicial action brought by EPA or by an authorized State. Changes under this paragraph are limited to the treatment, storage, or disposal of solid waste from releases that originate within the boundary of the facility. (revised 12/92)

(6) Addition of newly regulated units for the treatment, storage or disposal of hazardous waste if the owner or operator submits a revised part A permit application on or before the date on which the unit becomes subject to the new requirements.

(b) Except as specifically allowed under this paragraph, changes listed under paragraph (a) of this section may not be made if they amount to reconstruction of the hazardous waste management facility. Reconstruction occurs when the capital investment in the changes to the facility exceeds 50 percent of the capital cost of a comparable entirely new hazardous waste management facility. If all other requirements are met, the following changes may be made even if they amount to a reconstruction: (amended 11/90)

(1) Changes made solely for the purposes of complying with the requirements of 265.193 for tanks and ancillary equipment.

(2) If necessary to comply with Federal, State, or local requirements, changes to an existing unit, changes solely involving tanks or containers, or addition of replacement surface impoundments that satisfy the standards of this regulation or section 3004(o) .

(3) Changes that are necessary to allow owners or operators to continue handling newly listed or identified hazardous wastes that have been treated, stored, or disposed of at the facility prior to the effective date of the rule establishing the new listing or identification.

(4) Changes during closure of a facility or of a unit within a facility made in accordance with an approved closure plan.

(5) Changes necessary to comply with an interim status corrective action order issued under 44-56-140 or section 3008(h) or other authority, or by a court in a judicial proceeding, provided that such changes are limited to the treatment, storage, or disposal of solid waste from releases that originate within the boundary of the facility.

(6) Changes to treat or store, in tanks, containers, or containment buildings, hazardous wastes subject to land disposal restrictions imposed by part 268 or § 44-56-30 or RCRA section 3004, provided that such changes are made solely for the purpose of complying with part 268 or § 44-56-30 or RCRA section 3004. (revised 12/92)

(7) Addition of newly regulated units under paragraph (a)(6) of this section. (revised 12/92)

(8) Changes necessary to comply with standards under 40 CFR part 63, Subpart EEE - National Emission Standards for Hazardous Air Pollutants From Hazardous Waste Combustors.

HISTORY: Amended by State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 17, Issue No. 12, eff December 24, 1993; State Register Volume 23, Issue No. 11, eff November 26, 1999.

270.73. Termination of interim status.

Interim status terminates when:

(a) Final administrative disposition of a permit application, except an application for a remedial action plan (RAP) under subpart H of this part, is made; or

(b) Interim status is terminated as provided in Section 270.10(e)(5).

(c) For owners or operators of each land disposal facility which has been granted interim status prior to November 8, 1984, on November 8, 1985, unless:

(1) The owner or operator submits a Part B application for a permit for such facility prior to that date; and

(2) The owner or operator certifies that such facility is in compliance with all applicable groundwater monitoring and financial responsibility requirements.

(d) For owners or operators of each land disposal facility which is in existence on the effective date of statutory or regulatory amendments under the Act that render the facility subject to the requirement to have a permit under this regulation and which is granted interim status, twelve months after the date on which the facility first becomes subject to such permit requirement unless the owner or operator of such facility:

(1) Submits a Part B application for a permit for such facility before the date 12 months after the date on which the facility first becomes subject to such permit requirement; and

(2) Certifies that such facility is in compliance with all applicable groundwater monitoring and financial responsibility requirements.

(e) For owners or operators of any land disposal unit that is granted authority to operate under 270.72(a)(1), (2) or (3), on the date 12 months after the effective date of such requirement, unless the owner or operator certifies that such unit is in compliance with all applicable groundwater monitoring and financial responsibility requirements.

(f) For owners and operators of each incinerator facility which has achieved interim status prior to November 8, 1984, interim status terminates on November 8, 1989, unless the owner or operator of the facility submits a Part B application for a permit for an incinerator facility by November 8, 1986.

(g) For owners or operators of any facility (other than a land disposal or an incinerator facility) which has achieved interim status prior to November 8, 1984, interim status terminates on November 8, 1992, unless the owner or operator of the facility submits a Part B application for a permit for the facility by November 8, 1988.

(h) The Department determines that a facility's continuing violation of the standards included in R.61-79.265 could pose a threat to the health of persons or to the environment and efforts by the Department have proven unsuccessful in obtaining compliance.

HISTORY: Amended by State Register Volume 10, Issue No. 1, eff January 24, 1986; State Register Volume 11, Issue No. 11, eff November 27, 1987; State Register Volume 13, Issue No. 6, eff June 23, 1989; State Register Volume 14, Issue No. 11, eff November 23, 1990; State Register Volume 16, Issue No. 12, eff December 25, 1992; State Register Volume 24, Issue No. 8, eff August 25, 2000.

SUBPART H

Remedial Action Plans

270.79. Why is this subpart written in a special format?

This subpart is written in a special format to make it easier to understand the regulatory requirements. Like other regulations, this establishes enforceable legal requirements. For this Subpart, "I" and "you" refer to the owner/operator.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

General Information

270.80. What is a RAP?

(a) A RAP is a special form of RCRA permit that you, as an owner or operator, may obtain, instead of a permit issued under 270.3 through 270.66, to authorize you to treat, store, or dispose of hazardous remediation waste (as defined in 260.10 of this chapter) at a remediation waste management site. A RAP may only be issued for the area of contamination where the remediation wastes to be managed under the RAP originated, or areas in close proximity to the contaminated area, except as allowed in limited circumstances under 270.230.

(b) The requirements in 270.3 through 270.66 do not apply to RAPs unless those requirements for traditional RCRA permits are specifically required under 270.80 through 270.230. The definitions in 270.2 apply to RAPs.

(c) Notwithstanding any other provision of this part or part 124 of this chapter, any document that meets the requirements in this section constitutes a RCRA permit under RCRA section 3005(c).

(d) A RAP may be:

(1) A stand-alone document that includes only the information and conditions required by this subpart; or

(2) Part (or parts) of another document that includes information and/or conditions for other activities at the remediation waste management site, in addition to the information and conditions required by this subpart.

(e) If you are treating, storing, or disposing of hazardous remediation wastes as part of a cleanup compelled by Federal or State cleanup authorities, your RAP does not affect your obligations under those authorities in any way.

(f) If you receive a RAP at a facility operating under interim status, the RAP does not terminate your interim status.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.85. When do I need a RAP?

(a) Whenever you treat, store, or dispose of hazardous remediation wastes in a manner that requires a RCRA permit under 270.1, you must either obtain:

(1) A RCRA permit according to 270.3 through 270.66; or

(2) A RAP according to this subpart.

(b) Treatment units that use combustion of hazardous remediation wastes at a remediation waste management site are not eligible for RAPs under this Subpart.

(c) You may obtain a RAP for managing hazardous remediation waste at an already permitted RCRA facility. You must have these RAPs approved as a modification to your existing permit according to the requirements of 270.41 or 270.42 instead of the requirements in this Subpart. When you submit an application for such a modification, however, the information requirements in 270.42(a)(1)(i), (b)(1)(iv), and (c)(1)(iv) do not apply; instead, you must submit the information required under 270.110. When your permit is modified the RAP becomes part of the RCRA permit. Therefore when your permit (including the RAP portion) is modified, revoked and reissued, terminated or when it expires, it will be modified according to the applicable requirements in 270.40 through 270.42, revoked and reissued according to the applicable requirements in 270.41 and 270.43, terminated according to the applicable requirements in 270.43, and expire according to the applicable requirements in 270.50 and 270.51.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.90. Does my RAP grant me any rights or relieve me of any obligations?

The provisions of 270.4 apply to RAPs. (Note: The provisions of 270.4(a) provide you assurance that, as long as you comply with your RAP, the Department will consider you in compliance with Subtitle C of RCRA, and will not take enforcement actions against you. However, you should be aware of four exceptions to this provision that are listed in 270.4.)

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

Applying for a RAP

270.95. How do I apply for a RAP?

To apply for a RAP, you must complete an application, sign it, and submit it to the Department according to the requirements in this subpart.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.100. Who must obtain a RAP?

When a facility or remediation waste management site is owned by one person, but the treatment, storage or disposal activities are operated by another person, it is the operator's duty to obtain a RAP, except that the owner must also sign the RAP application.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.105. Who must sign the application and any required reports for a RAP?

Both the owner and the operator must sign the RAP application and any required reports according to 270.11(a), (b), and (c). In the application, both the owner and the operator must also make the certification required under 270.11(d)(1). However, the owner may choose the alternative certification under 270.11(d)(2) if the operator certifies under 270.11(d)(1).

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.110. What must I include in my application for a RAP?

You must include the following information in your application for a RAP:

- (a) The name, address, and EPA identification number of the remediation waste management site;
- (b) The name, address, and telephone number of the owner and operator;
- (c) The latitude and longitude of the site;
- (d) The United States Geological Survey (USGS) or county map showing the location of the remediation waste management site;
- (e) A scaled drawing of the remediation waste management site showing:
 - (1) The remediation waste management site boundaries;
 - (2) Any significant physical structures; and
 - (3) The boundary of all areas on-site where remediation waste is to be treated, stored or disposed;
- (f) A specification of the hazardous remediation waste to be treated, stored or disposed of at the facility or remediation waste management site. This must include information on:
 - (1) Constituent concentrations and other properties of the hazardous remediation wastes that may affect how such materials should be treated and/or otherwise managed;
 - (2) An estimate of the quantity of these wastes; and
 - (3) A description of the processes you will use to treat, store, or dispose of this waste including technologies, handling systems, design and operating parameters you will use to treat hazardous remediation wastes before disposing of them according to the LDR standards of part 268 of this chapter, as applicable;
- (g) Enough information to demonstrate that operations that follow the provisions in your RAP application will ensure compliance with applicable requirements of parts 264, 266, and 268 of this chapter;
- (h) Such information as may be necessary to enable the Department to carry out its duties under other Federal laws as is required for traditional RCRA permits under 270.14(b)(20);
- (i) Any other information the Department decides is necessary for demonstrating compliance with this subpart or for determining any additional RAP conditions that are necessary to protect human health and the environment.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.115. What if I want to keep this information confidential?

The South Carolina Freedom of Information Act may allow you to claim as confidential any or all of the information you submit to the Department under this subpart. You must assert any such claim at the time that you submit your RAP application or other submissions by stamping the words "confidential business information" on each page containing such information. If you do assert a claim at the time you submit the information, the Department will treat the information according to established procedures which will give you an opportunity to demonstrate that the information for which protection is sought falls into one of the exceptions under Code Section 30-4-40. If you do not assert a claim at the time you submit the information, the Department may make the information available to the public without further notice to you. The Department will deny any requests for confidentiality of your name and or address.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.120. To whom must I submit my RAP application?

You must submit your application for a RAP to the Department for approval.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.125. If I submit my RAP application as part of another document, what must I do?

If you submit your application for a RAP as a part of another document, you must clearly identify the components of that document that constitute your RAP application.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

Getting a RAP Approved

270.130. What is the process for approving or denying my application for a RAP?

(a) If the Department tentatively finds that your RAP application includes all of the information required by 270.110 and that your proposed remediation waste management activities meet the regulatory standards, the Department will make a tentative decision to approve your RAP application. The Department will then prepare a draft RAP and provide an opportunity for public comment before making a final decision on your RAP application, according to this subpart.

(b) If the Department tentatively finds that your RAP application does not include all of the information required by 270.110 or that your proposed remediation waste management activities do not meet the regulatory standards, the Department may request additional information from you or ask you to correct deficiencies in your application. If you fail or refuse to provide any additional information the Department requests, or to correct any deficiencies in your RAP application, the Department may make a tentative decision to deny your RAP application. After making this tentative decision, the Department will prepare a notice of intent to deny your RAP application (“notice of intent to deny”) and provide an opportunity for public comment before making a final decision on your RAP application, according to the requirements in this Subpart. The Department may deny the RAP application either in its entirety or in part.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.135. What must the Department include in a draft RAP?

If the Department prepares a draft RAP, it must include the:

(a) Information required under 270.110(a) through (f);

(b) The following terms and conditions:

(1) Terms and conditions necessary to ensure that the operating requirements specified in your RAP comply with applicable requirements of parts 264, 266, and 268 of this chapter (including any recordkeeping and reporting requirements). In satisfying this provision, the Department may incorporate, expressly or by reference, applicable requirements of parts 264, 266, and 268 of this chapter into the RAP or establish site-specific conditions as required or allowed by parts 264, 266, and 268 of this chapter;

(2) Terms and conditions in 270.30;

(3) Terms and conditions for modifying, revoking and reissuing, and terminating your RAP, as provided in 270.170; and

(4) Any additional terms or conditions that the Department determines are necessary to protect human health and the environment, including any terms and conditions necessary to respond to spills and leaks during use of any units permitted under the RAP; and

(c) If the draft RAP is part of another document, as described in 270.80(d)(2), the Department must clearly identify the components of that document that constitute the draft RAP.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.140. What else must the Department prepare in addition to the draft RAP or notice of intent to deny?

Once the Department has prepared the draft RAP or notice of intent to deny, it must then:

- (a) Prepare a statement of basis that briefly describes the derivation of the conditions of the draft RAP and the reasons for them, or the rationale for the notice of intent to deny;
- (b) Compile an administrative record, including:
 - (1) The RAP application and any supporting data furnished by the applicant;
 - (2) The draft RAP or notice of intent to deny;
 - (3) The statement of basis and all documents cited therein (material readily available at the issuing Regional office or published material that is generally available need not be physically included with the rest of the record, as long as it is specifically referred to in the statement of basis); and
 - (4) Any other documents that support the decision to approve or deny the RAP; and
- (c) Make information contained in the administrative record available for review by the public upon request.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.145. What are the procedures for public comment on the draft RAP or notice of intent to deny?

- (a) The Department must:
 - (1) Send notice to you of its intention to approve or deny your RAP application, and send you a copy of the statement of basis;
 - (2) Publish a notice of its intention to approve or deny your RAP application in a major local newspaper of general circulation;
 - (3) Broadcast its intention to approve or deny your RAP application over a local radio station; and
 - (4) Send a notice of its intention to approve or deny your RAP application to each unit of local government having jurisdiction over the area in which your site is located, and to each State agency having any authority under State law with respect to any construction or operations at the site.
- (b) The notice required by paragraph (a) of this section must provide an opportunity for the public to submit written comments on the draft RAP or notice of intent to deny within at least 45 days.
- (c) The notice required by paragraph (a) of this section must include:
 - (1) The name and address of the office processing the RAP application;
 - (2) The name and address of the RAP applicant, and if different, the remediation waste management site or activity the RAP will regulate;
 - (3) A brief description of the activity the RAP will regulate;
 - (4) The name, address and telephone number of a person from whom interested persons may obtain further information, including copies of the draft RAP or notice of intent to deny, statement of basis, and the RAP application;
 - (5) A brief description of the comment procedures in this section, and any other procedures by which the public may participate in the RAP decision;
 - (6) If a hearing is scheduled, the date, time, location and purpose of the hearing;
 - (7) If a hearing is not scheduled, a statement of procedures to request a hearing;
 - (8) The location of the administrative record, and times when it will be open for public inspection; and
 - (9) Any additional information the Department considers necessary or proper.
- (d) If, within the comment period, the Department receives written notice of opposition to its intention to approve or deny your RAP application and a request for a hearing, the Department must hold an informal public hearing to discuss issues relating to the approval or denial of your RAP application. The Department may also determine on its own initiative that an informal hearing is appropriate. The hearing must include an opportunity for any person to present written or oral comments. Whenever possible, the Department must schedule this hearing at a location convenient to the nearest population center to the remediation waste management site and give notice according to

the requirements in paragraph (a) of this section. This notice must, at a minimum, include the information required by paragraph (c) of this section and:

- (1) Reference to the date of any previous public notices relating to the RAP application;
- (2) The date, time and place of the hearing; and
- (3) A brief description of the nature and purpose of the hearing, including the applicable rules and procedures.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.150. How will the Department make a final decision on my RAP application?

(a) The Department must consider and respond to any significant comments raised during the public comment period, or during any hearing on the draft RAP or notice of intent to deny, and revise your draft RAP based on those comments, as appropriate.

(b) If the Department determines that your RAP includes the information and terms and conditions required in 270.135, then it will issue a final decision approving your RAP and, in writing, notify you and all commenters on your draft RAP that your RAP application has been approved.

(c) If the Department determines that your RAP does not include the information required in 270.135, then it will issue a final decision denying your RAP and, in writing, notify you and all commenters on your draft RAP that your RAP application has been denied.

(d) If the Department's final decision is that the tentative decision to deny the RAP application was incorrect, it will withdraw the notice of intent to deny and proceed to prepare a draft RAP, according to the requirements in this subpart.

(e) When the Department issues its final RAP decision, it must refer to the procedures for appealing the decision under 270.155.

(f) Before issuing the final RAP decision, the Department must compile an administrative record. Material readily available at the Department or published materials which are generally available and which are included in the administrative record need not be physically included with the rest of the record as long as it is specifically referred to in the statement of basis or the response to comments. The administrative record for the final RAP must include information in the administrative record for the draft RAP (see 270.140(b)) and:

- (1) All comments received during the public comment period;
- (2) Tapes or transcripts of any hearings;
- (3) Any written materials submitted at these hearings;
- (4) The responses to comments;
- (5) Any new material placed in the record since the draft RAP was issued;
- (6) Any other documents supporting the RAP; and
- (7) A copy of the final RAP.

(g) The Department must make information contained in the administrative record available for review by the public upon request.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.155. May the decision to approve or deny my RAP application be administratively appealed?

(a) Any commenter on the draft RAP or notice of intent to deny, or any participant in any public hearing(s) on the draft RAP, may appeal the Department's decision to approve or deny your RAP application to the Department's Board under 124.19 of this chapter. Any person who did not file comments, or did not participate in any public hearing(s) on the draft RAP, may petition for administrative review only to the extent of the changes from the draft to the final RAP decision. Appeals of RAPs may be made to the same extent as for final permit decisions under 124.15 of this chapter (or a decision under 270.29 to deny a permit for the active life of a RCRA hazardous waste management facility or unit). Instead of the notice required under 124.19(c) and 124.10 of this chapter, the Department will give public notice of any grant of review of RAPs by the Board of Health

and Environmental Control through the same means used to provide notice under 270.145. The notice will include:

- (1) The briefing schedule for the appeal as provided by the Board;
- (2) A statement that any interested person may file an amicus brief with the Board; and
- (3) The information specified in 270.145(c), as appropriate.

(b) This appeal is a prerequisite to seeking judicial review of these actions.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.160. When does my RAP become effective?

Your RAP becomes effective 15 days after the Department notifies you and all commenters that your RAP is approved unless:

- (a) The Department specifies a later effective date in its decision;
- (b) You or another person has appealed your RAP under 270.155 (if your RAP is appealed, and the request for review is granted under 270.155, conditions of your RAP are stayed according to 124.16 of this chapter); or
- (c) No commenters requested a change in the draft RAP, in which case the RAP becomes effective immediately when it is issued.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.165. When may I begin physical construction of new units permitted under the RAP?

You must not begin physical construction of new units permitted under the RAP for treating, storing or disposing of hazardous remediation waste before receiving a finally effective RAP.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

How May my RAP be Modified, Revoked and Reissued, or Terminated?

270.170. After my RAP is issued, how may it be modified, revoked and reissued, or terminated?

In your RAP, the Department must specify, either directly or by reference, procedures for future modifications, revocations and reissuance, or terminations of your RAP. These procedures must provide adequate opportunities for public review and comment on any modification, revocation and reissuance, or termination that would significantly change your management of your remediation waste, or that otherwise merits public review and comment. If your RAP has been incorporated into a traditional RCRA permit, as allowed under 270.85(c), then the RAP will be modified according to the applicable requirements in 270.40 through 270.42, revoked and reissued according to the applicable requirements in 270.41 and 270.43, or terminated according to the applicable requirements of 270.43.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.175. For what reasons may the Department choose to modify my final RAP?

(a) The Department may modify your final RAP on its own initiative only if one or more of the following reasons listed in this section exist(s). If one or more of these reasons do not exist, then the Department will not modify your final RAP, except at your request. Reasons for modification are:

- (1) You made material and substantial alterations or additions to the activity that justify applying different conditions;
- (2) The Department finds new information that was not available at the time of RAP issuance and would have justified applying different RAP conditions at the time of issuance;
- (3) The standards or regulations on which the RAP was based have changed because of new or amended statutes, standards or regulations, or by judicial decision after the RAP was issued;
- (4) If your RAP includes any schedules of compliance, the Department may find reasons to modify your compliance schedule, such as an act of God, strike, flood, or materials shortage or other events over which you as the owner operator have little or no control and for which there is no reasonably available remedy;

- (5) You are not in compliance with conditions of your RAP;
- (6) You failed in the application or during the RAP issuance process to disclose fully all relevant facts, or you misrepresented any relevant facts at the time;
- (7) The Department has determined that the activity authorized by your RAP endangers human health or the environment and can only be remedied by modifying; or
- (8) You have notified the Department (as required in the RAP under 270.30(1)(3)) of a proposed transfer of a RAP.

(b) Notwithstanding any other provision in this section, when the Department reviews a RAP for a land disposal facility under 270.195, it may modify the permit as necessary to assure that the facility continues to comply with the currently applicable requirements in parts 124, 260 through 266 and 270 of this chapter.

(c) The Department will not reevaluate the suitability of the facility location at the time of RAP modification unless new information or standards indicate that a threat to human health or the environment exists that was unknown when the RAP was issued.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.180. For what reasons may the Department choose to revoke and reissue my final RAP?

(a) The Department may revoke and reissue your final RAP on its own initiative only if one or more reasons for revocation and reissuance exist(s). If one or more reasons do not exist, then the Department will not modify or revoke and reissue your final RAP, except at your request. Reasons for modification or revocation and reissuance are the same as the reasons listed for RAP modifications in 270.175(a)(5) through (8) if the Department determines that revocation and reissuance of your RAP is appropriate.

(b) The Department will not reevaluate the suitability of the facility location at the time of RAP revocation and reissuance, unless new information or standards indicate that a threat to human health or the environment exists that was unknown when the RAP was issued.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.185. For what reasons may the Department choose to terminate my final RAP, or deny my renewal application?

The Department may terminate your final RAP on its own initiative, or deny your renewal application for the same reasons as those listed for RAP modifications in 270.175(a)(5) through (7) if the Department determines that termination of your RAP or denial of your RAP renewal application is appropriate.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.190. May the decision to approve or deny a modification, revocation and reissuance, or termination of my RAP be administratively appealed?

(a) Any commenter on the modification, revocation and reissuance or termination, or any person who participated in any hearing(s) on these actions, may appeal the Department's decision to approve a modification, revocation and reissuance, or termination of your RAP, according to 270.155. Any person who did not file comments or did not participate in any public hearing(s) on the modification, revocation and reissuance or termination, may petition for administrative review only of the changes from the draft to the final RAP decision.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.195. When will my RAP expire?

RAPs must be issued for a fixed term, not to exceed 10 years, although they may be renewed upon approval by the Department in fixed increments of no more than ten years. In addition, the Department must review any RAP for hazardous waste land disposal five years after the date of issuance or reissuance and you or the Department must follow the requirements for modifying your

RAP as necessary to assure that you continue to comply with currently applicable requirements in RCRA sections 3004 and 3005.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.200. How may I renew my RAP if it is expiring?

If you wish to renew your expiring RAP, you must follow the process for application for and issuance of RAPs in this subpart.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.205. What happens if I have applied correctly for a RAP renewal but have not received approval by the time my old RAP expires?

If you have submitted a timely and complete application for a RAP renewal, but the Department, through no fault of yours, has not issued a new RAP with an effective date on or before the expiration date of your previous RAP, your previous RAP conditions continue in force until the effective date of your new RAP or RAP denial.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

Operating Under Your RAP

270.210. What records must I maintain concerning my RAP?

You are required to keep records of:

- (a) All data used to complete RAP applications and any supplemental information that you submit for a period of at least 3 years from the date the application is signed; and
- (b) Any operating and/or other records the Department requires you to maintain as a condition of your RAP.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.215. How are time periods in the requirements in this subpart and my RAP computed?

(a) Any time period scheduled to begin on the occurrence of an act or event must begin on the day after the act or event. (For example, if your RAP specifies that you must close a staging pile within 180 days after the operating term for that staging pile expires, and the operating term expires on June 1, then June 2 counts as day one of your 180 days, and you would have to complete closure by November 28.)

(b) Any time period scheduled to begin before the occurrence of an act or event must be computed so that the period ends on the day before the act or event. (For example, if you are transferring ownership or operational control of your site, and wish to transfer your RAP, the new owner or operator must submit a revised RAP application no later than 90 days before the scheduled change. Therefore, if you plan to change ownership on January 1, the new owner/operator must submit the revised RAP application no later than October 3, so that the 90th day would be December 31.)

(c) If the final day of any time period falls on a weekend or legal holiday, the time period must be extended to the next working day. (For example, if you wish to appeal the Department's decision to modify your RAP, then you must petition the Department of Health and Environmental Control within 15 days after the Department has issued the final RAP decision. If the 15th day falls on Sunday, then you may submit your appeal by the Monday after. If the 15th day falls on July 4th, then you may submit your appeal by July 5th.)

(d) Except for filing petitions of final RAP decisions, whenever a party or interested person has the right to or is required to act within a prescribed period after the service of notice or other paper upon him by mail, 3 days must be added to the prescribed term. Petitions of RAP decisions must be received by the Clerk of the Board on or before the fifteenth day after you receive the final decision.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.220. How may I transfer my RAP to a new owner or operator?

(a) If you wish to transfer your RAP to a new owner or operator, you must follow the requirements specified in your RAP for RAP modification to identify the new owner or operator, and incorporate any other necessary requirements. These modifications do not constitute “significant” modifications for purposes of 270.170. The new owner/operator must submit a revised RAP application no later than 90 days before the scheduled change along with a written agreement containing a specific date for transfer of RAP responsibility between you and the new permittees.

(b) When a transfer of ownership or operational control occurs, you as the old owner or operator must comply with the applicable requirements in part 264, subpart H (Financial Requirements), of this chapter until the new owner or operator has demonstrated that he is complying with the requirements in that subpart. The new owner or operator must demonstrate compliance with part 264, subpart H, of this chapter within six months of the date of the change in ownership or operational control of the facility or remediation waste management site. When the new owner/operator demonstrates compliance with part 264, subpart H, of this chapter to the Department, the Department will notify you that you no longer need to comply with part 264, subpart H, of this chapter as of the date of demonstration.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

270.225. What must the State report about noncompliance with RAPs?

The State must report noncompliance with RAPs according to the provisions of 270.5.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

Obtaining a RAP for an Off-Site Location

270.230. May I perform remediation waste management activities under a RAP at a location removed from the area where the remediation wastes originated?

(a) You may request a RAP for remediation waste management activities at a location removed from the area where the remediation wastes originated if you believe such a location would be more protective than the contaminated area or areas in close proximity.

(b) If the Department determines that an alternative location, removed from the area where the remediation waste originated, is more protective than managing remediation waste at the area of contamination or areas in close proximity, then the Department may approve a RAP for this alternative location.

(c) You must request the RAP, and the Department will approve or deny the RAP, according to the procedures and requirements in this subpart.

(d) A RAP for an alternative location must also meet the following requirements, which the Department must include in the RAP for such locations:

- (1) The RAP for the alternative location must be issued to the person responsible for the cleanup from which the remediation wastes originated;
- (2) The RAP is subject to the expanded public participation requirements in 124.31, 124.32, and 124.33 of this chapter;
- (3) The RAP is subject to the public notice requirements in 124.10(c) of this chapter;
- (4) The site permitted in the RAP may not be located within 61 meters or 200 feet of a fault which has had displacement in the Holocene time (you must demonstrate compliance with this standard through the requirements in 270.14(b)(11)) (See definitions of terms in 264.18(a) of this chapter);

Note to paragraph (d)(4): Sites located in political jurisdictions other than those listed in Appendix VI of Part 264 of this chapter, are assumed to be in compliance with this requirement.

(e) These alternative locations are remediation waste management sites, and retain the following benefits of remediation waste management sites:

- (1) Exclusion from facility-wide corrective action under 264.101 of this chapter; and
- (2) Application of 264.1(j) of this chapter in lieu of part 264, subparts B, C, and D, of this chapter.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000.

SUBPART I
Integration with Maximum Achievable Control Technology (MACT) Standards

270.235. Options for incinerators, cement kilns, lightweight aggregate kilns, solid fuel boilers, liquid fuel boilers and hydrochloric acid production furnaces to minimize emissions from startup, shutdown, and malfunction events.

(a) Facilities with existing permits.

(1) Revisions to permit conditions after documenting compliance with MACT. The owner or operator of a RCRA-permitted incinerator, cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace may request that the Department address permit conditions that minimize emissions from startup, shutdown, and malfunction events under any of the following options when requesting removal of permit conditions that are no longer applicable according to 264.340(b) and 266.100(b):

(i) Retain relevant permit conditions. Under this option, the Department will:

(A) Retain permit conditions that address releases during startup, shutdown, and malfunction events, including releases from emergency safety vents, as these events are defined in the facility's startup, shutdown, and malfunction plan required under 63.1206(c)(2); and

(B) Limit applicability of those permit conditions only to when the facility is operating under its startup, shutdown, and malfunction plan.

(ii) Revise relevant permit conditions.

(A) Under this option, the Department will:

(1) Identify a subset of relevant existing permit requirements, or develop alternative permit requirements, that ensure emissions of toxic compounds are minimized from startup, shutdown, and malfunction events, including releases from emergency safety vents, based on review of information including the source's startup, shutdown, and malfunction plan, design, and operating history.

(2) Retain or add these permit requirements to the permit to apply only when the facility is operating under its startup, shutdown, and malfunction plan.

(B) Changes that may significantly increase emissions.

(1) You must notify the Department in writing of changes to the startup, shutdown, and malfunction plan or changes to the design of the source that may significantly increase emissions of toxic compounds from startup, shutdown, or malfunction events, including releases from emergency safety vents. You must notify the Department of such changes within five days of making such changes. You must identify in the notification recommended revisions to permit conditions necessary as a result of the changes to ensure that emissions of toxic compounds are minimized during these events.

(2) The Department may revise permit conditions as a result of these changes to ensure that emissions of toxic compounds are minimized during startup, shutdown, or malfunction events, including releases from emergency safety vents either:

(i) Upon permit renewal, or, if warranted;

(ii) By modifying the permit under 270.41(a) or 270.42.

(iii) Remove permit conditions. Under this option:

(A) The owner or operator must document that the startup, shutdown, and malfunction plan required under 63.1206(c)(2) has been approved by the Department under 40 CFR 63.1206(c)(2)(ii)(B); and

(B) The Department will remove permit conditions that are no longer applicable according to 264.340(b) and 266.100(b).

(2) Addressing permit conditions upon permit reissuance. The owner or operator of an incinerator, cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace that has conducted a comprehensive performance test and submitted to the Department a Notification of Compliance documenting compliance with the standards of 40 CFR part

63, Subpart EEE, may request in the application to reissue the permit for the combustion unit that the Department control emissions from startup, shutdown, and malfunction events under any of the following options:

(i) RCRA option A.

(A) Under this option, the Department will:

(1) Include, in the permit, conditions that ensure compliance with 264.345(a) and 264.345(c) or 266.102(e)(1) and 266.102(e)(2)(iii) to minimize emissions of toxic compounds from startup, shutdown, and malfunction events, including releases from emergency safety vents; and

(2) Specify that these permit requirements apply only when the facility is operating under its startup, shutdown, and malfunction plan; or

(ii) RCRA option B.

(A) Under this option, the Department will:

(1) Include, in the permit conditions, that ensure emissions of toxic compounds are minimized from startup, shutdown, and malfunction events, including releases from emergency safety vents, based on review of information including the source's startup, shutdown, and malfunction plan, design, and operating history; and

(2) Specify that these permit requirements apply only when the facility is operating under its startup, shutdown, and malfunction plan.

(B) Changes that may significantly increase emissions.

(1) You must notify the Department in writing of changes to the startup, shutdown, and malfunction plan or changes to the design of the source that may significantly increase emissions of toxic compounds from startup, shutdown, or malfunction events, including releases from emergency safety vents. You must notify the Department of such changes within five days of making such changes. You must identify in the notification recommended revisions to permit conditions necessary as a result of the changes to ensure that emissions of toxic compounds are minimized during these events.

(2) The Department may revise permit conditions as a result of these changes to ensure that emissions of toxic compounds are minimized during startup, shutdown, or malfunction events, including releases from emergency safety vents either:

(i) Upon permit renewal, or, if warranted;

(ii) By modifying the permit under 270.41(a) or 270.42; or

(iii) CAA option. Under this option:

(A) The owner or operator must document that the startup, shutdown, and malfunction plan required under 40 CFR 63.1206(c)(2) has been approved by the Department under 63.1206(c)(2)(ii)(B); and

(B) The Department will omit from the permit conditions that are not applicable under 264.340(b) and 266.100(b).

(b) Interim status facilities.

(1) Interim status operations. In compliance with 265.340 and 266.100(b), the owner or operator of an incinerator, cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace that is operating under the interim status standards of part 265 or 266 may control emissions of toxic compounds during startup, shutdown, and malfunction events under either of the following options after conducting a comprehensive performance test and submitting to the Department a Notification of Compliance documenting compliance with the standards of 40 CFR part 63, Subpart EEE:

(i) RCRA option. Under this option, the owner or operator continues to comply with the interim status emission standards and operating requirements of part 265 or 266 relevant to control of emissions from startup, shutdown, and malfunction events. Those standards and requirements apply only during startup, shutdown, and malfunction events; or

(ii) CAA option. Under this option, the owner or operator is exempt from the interim status standards of part 265 or 266 relevant to control of emissions of toxic compounds during startup,

shutdown, and malfunction events upon submission of written notification and documentation to the Department that the startup, shutdown, and malfunction plan required under 63.1206(c)(2) has been approved by the Department under 63.1206(c)(2)(ii)(B).

(2) Operations under a subsequent RCRA permit. When an owner or operator of an incinerator, cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace that is operating under the interim status standards of parts 265 or 266 submits a RCRA permit application, the owner or operator may request that the Department control emissions from startup, shutdown, and malfunction events under any of the options provided by (a)(2)(i), (a)(2)(ii), or (a)(2)(iii).

(c) New units. Hazardous waste incinerator, cement kiln, lightweight aggregate kiln, solid fuel boiler, liquid fuel boiler, or hydrochloric acid production furnace units that become subject to RCRA permit requirements after October 12, 2005 must control emissions of toxic compounds during startup, shutdown, and malfunction events under either of the following options:

(1) Comply with the requirements specified in 40 CFR 63.1206(c)(2); or

(2) Request to include in the RCRA permit, conditions that ensure emissions of toxic compounds are minimized from startup, shutdown, and malfunction events, including releases from emergency safety vents, based on review of information including the source's startup, shutdown, and malfunction plan and design. The Department will specify that these permit conditions apply only when the facility is operating under its startup, shutdown, and malfunction plan.

HISTORY: Added by State Register Volume 27, Issue No. 6, Part 1, eff June 27, 2003. Amended by State Register Volume 32, Issue No. 6, eff June 27, 2008.

61-79.273. UNIVERSAL WASTE RULE.

SUBPART A

General

273.1. Scope.

(a) This part establishes requirements for managing the following:

- (1) Batteries as described in 273.2;
- (2) Pesticides as described in 273.3;
- (3) Mercury-containing equipment as described in 273.4;
- (4) Lamps as described in 273.5; and
- (5) Aerosol cans as described in 273.6 of this chapter.

(b) This part provides an alternative set of management standards in lieu of regulation under parts 260 through 272.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.2. Applicability — batteries.

(a) Batteries covered under part 273

(1) The requirements of this part apply to persons managing batteries, as described in 273.9, except those listed in paragraph (b) of this section.

(2) Spent lead-acid batteries which are not managed under part 266, subpart G, are subject to management under this part.

(b) Batteries not covered under part 273. The requirements of this part do not apply to persons managing the following batteries:

- (1) Spent lead-acid batteries that are managed under part 266, subpart G.
- (2) Batteries, as described in 273.9, that are not yet wastes under part 261 of this chapter, including those that do not meet the criteria for waste generation in paragraph (c) of this section.

(3) Batteries, as described in 273.9, that are not hazardous waste. A battery is a hazardous waste if it exhibits one or more of the characteristics identified in 261 Subpart C.

(c) Generation of waste batteries.

(1) A used battery becomes a waste on the date it is discarded (e.g., when sent for reclamation).

(2) An unused battery becomes a waste on the date the handler decides to discard it.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

273.3. Applicability — pesticides.

(a) Pesticides covered under this part 273. The requirements of this part apply to persons managing pesticides, as described in 273.9, meeting the following conditions, except those listed in paragraph (b) of this section:

(1) Recalled pesticides that are:

(i) Stocks of a suspended and canceled pesticide that are part of a voluntary or mandatory recall under FIFRA Section 19(b), including, but not limited to those owned by the registrant responsible for conducting the recall; or

(ii) Stocks of a suspended or canceled pesticide, or a pesticide that is not in compliance with FIFRA, that are part of a voluntary recall by the registrant.

(2) Stocks of other unused pesticide products that are collected and managed as part of a waste pesticide collection program.

(b) Pesticides not covered under part 273.

The requirements of this part do not apply to persons managing the following pesticides:

(1) Recalled pesticides described in paragraph (a)(1) of this section, and unused pesticide products described in paragraph (a)(2) of this section, that are managed by farmers in compliance with 262.70. (262.70 addresses pesticides disposed of on the farmer's own farm in a manner consistent with the disposal instructions on the pesticide label, providing the container is triple rinsed in accordance with 261.7(b)(3));

(2) Pesticides not meeting the conditions set forth in paragraph (a) of this section. These pesticides must be managed in compliance with the hazardous waste regulations in parts 260 through 272, except that aerosol cans as defined in 273.9 that contain pesticides may be managed as aerosol can universal waste under 273.13(e) or 273.33(e);

(3) Pesticides that are not wastes under part 261 of this chapter, including those that do not meet the criteria for waste generation in paragraph (c) of this section or those that are not wastes as described in paragraph (d) of this section; and

(4) Pesticides that are not hazardous waste. A pesticide is a hazardous waste if it is listed in part 261, subpart D or if it exhibits one or more of the characteristics identified in part 261, subpart C.

(c) When a pesticide becomes a waste

(1) A recalled pesticide described in paragraph (a)(1) of this section becomes a waste on the first date on which both of the following conditions apply:

(i) The generator of the recalled pesticide agrees to participate in the recall; and

(ii) The person conducting the recall decides to discard (e.g., burn the pesticide for energy recovery).

(2) An unused pesticide product described in paragraph (a)(2) of this section becomes a waste on the date the generator decides to discard it.

(d) Pesticides that are not wastes. The following pesticides are not wastes:

(1) Recalled pesticides described in paragraph (a)(1) of this section, provided that the person conducting the recall:

(i) has not made a decision to discard (e.g., burn for energy recovery) the pesticide. Until such a decision is made, the pesticide does not meet the definition of "solid waste" under 261.2; thus the pesticide is not a hazardous waste and is not subject to hazardous waste requirements, including part 273 of this chapter. This pesticide remains subject to the requirements of FIFRA; or

(ii) has made a decision to use a management option that, under 261.2, does not cause the pesticide to be a solid waste (i.e., the selected option is use (other than use constituting disposal) or reuse (other than burning for energy recovery), or reclamation). Such a pesticide is not a solid waste and therefore is not a hazardous waste, and is not subject to the hazardous waste requirements including part 273 of this chapter. This pesticide, including a recalled pesticide that is exported to a foreign destination for use or reuse, remains subject to the requirements of FIFRA.

(2) Unused pesticide products described in paragraph (a)(2) of this section, if the generator of the unused pesticide product has not decided to discard (e.g., burn for energy recovery) them. These pesticides remain subject to the requirements of FIFRA.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.4. Applicability—Mercury-containing equipment.

(a) Mercury-containing equipment covered under this part 273. The requirements of this part apply to persons managing mercury-containing equipment, as described in 273.9, except those listed in paragraph (b) of this section.

(b) Mercury-containing equipment not covered under this part 273. The requirements of this part do not apply to persons managing the following mercury-containing equipment

(1) Mercury-containing equipment that is not yet a waste under part 261 of this chapter. Paragraph (c) of this section describes when mercury-containing equipment becomes a waste;

(2) Mercury-containing equipment that is not a hazardous waste. Mercury-containing equipment is a hazardous waste if it exhibits one or more of the characteristics identified in part 261, subpart C or is listed in part 261, subpart D; and

(3) Equipment and devices from which the mercury-containing components have been removed.

(c) Generation of waste mercury-containing equipment.

(1) Used mercury-containing equipment becomes a waste on the date it is discarded.

(2) Unused mercury-containing equipment becomes a waste on the date the handler decides to discard it.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

273.5. Applicability — household and conditionally exempt small quantity generator waste.

(a) Lamps covered under this part 273. The requirements of this part apply to persons managing lamps as described in 273.9, except those listed in paragraph (b) of this section.

(b) Lamps not covered under this part 273. The requirements of this part do not apply to persons managing the following lamps:

(1) Lamps that are not yet wastes under part 261 of this chapter as provided in paragraph (c) of this section.

(2) Lamps that are not hazardous waste. A lamp is a hazardous waste if it exhibits one or more of the characteristics identified in part 261, subpart C of this chapter.

(c) Generation of waste lamps.

(1) A used lamp becomes a waste on the date it is discarded.

(2) An unused lamp becomes a waste on the date the handler decides to discard it.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

273.6. Applicability—Aerosol Cans.

(a) Aerosol cans covered under this part. The requirements of this part apply to persons managing aerosol cans, as described in 273.9, except those listed in paragraph (b) of this section.

(b) Aerosol cans not covered under this part. The requirements of this part do not apply to persons managing the following types of aerosol cans:

(1) Aerosol cans that are not yet waste under part 261 of this chapter. Paragraph (c) of this section describes when an aerosol can becomes a waste;

(2) Aerosol cans that are not hazardous waste. An aerosol can is a hazardous waste if the aerosol can exhibits one or more of the characteristics identified in part 261 subpart C of this chapter or the aerosol can contains a substance that is listed in part 261 subpart D of this chapter; and

(3) Aerosol cans that meet the standard for empty containers under 261.7 of this chapter.

(c) Generation of waste aerosol cans.

(1) A used aerosol can becomes a waste on the date it is discarded.

(2) An unused aerosol can becomes a waste on the date the handler decides to discard it.

HISTORY: Added by SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.8. Applicability—household and very small quantity generator waste.

(a) Persons managing the wastes listed below may, at their option, manage them under the requirements of this part:

(1) Household wastes that are exempt under 261.4(b)(1) of this chapter and are also of the same type as the universal wastes defined at 273.9; and/or

(2) Very small quantity generator wastes that are exempt under R.61-79.262.14 and are also of the same type as the universal wastes defined at 273.9.

HISTORY: Added by State Register Volume 24, Issue No. 8, eff August 25, 2000. Amended by SCSR 43-5 Doc. No. 4841, eff May 24, 2019.

273.9. Definitions.

Aerosol can means a non-refillable receptacle containing a gas compressed, liquefied, or dissolved under pressure, the sole purpose of which is to expel a liquid, paste, or powder and fitted with a self-closing release device allowing the contents to be ejected by the gas.

Ampule means an airtight vial made of glass, plastic, metal, or any combination of these materials.

Battery means a device consisting of one or more electrically connected electrochemical cells which is designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.

Destination facility means a facility that treats, disposes of, or recycles a particular category of universal waste, except those management activities described in subparagraphs (a) and (c) of sections 273.13 and 273.33. A facility at which a particular category of universal waste is only accumulated, is not a destination facility for purposes of managing that category of universal waste.

FIFRA means the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. 136 - 136y). Generator means any person, by site, whose act or process produces hazardous waste identified or listed in part 261 of this chapter or whose act first causes a hazardous waste to become subject to regulation.

Generator means any person, by site, whose act or process produces hazardous waste identified or listed in part 261 of this chapter or whose act first causes a hazardous waste to become subject to regulation.

Lamp, also referred to as “universal waste lamp” is defined as the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common universal waste electric lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps. (8/00)

Large Quantity Handler of Universal Waste means a universal waste handler (as defined in this section) who accumulates 5,000 kilograms or more total of universal waste (batteries, pesticides, mercury-containing equipment, lamps, or aerosol cans, calculated collectively) at any time. This

designation as a large quantity handler of universal waste is retained through the end of the calendar year in which the 5,000-kilogram limit is met or exceeded.

Mercury-containing equipment means a device or part of a device (including thermostats, but excluding batteries and lamps) that contains elemental mercury integral to its function.

On-site means the same or geographically contiguous property which may be divided by public or private right-of-way, provided that the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along the right of way. Non-contiguous properties owned by the same person but connected by a right-of-way which he controls and to which the public does not have access, are also considered on-site property.

Pesticide means any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any pest, or intended for use as a plant regulator, defoliant, or desiccant, other than any article that:

- (1) is a new animal drug under FFDCa section 201(w); or
- (2) is an animal drug that has been determined by regulation of the Secretary of Health and Human Services not to be a new animal drug; or
- (3) is an animal feed under FFDCa section 201(x) that bears or contains any substances described by paragraph (1) or (2) of this definition.

Small Quantity Handler of Universal Waste means a universal waste handler (as defined in this section) who does not accumulate 5,000 kilograms or more of universal waste (batteries, pesticides, mercury-containing equipment, lamps, or aerosol cans, calculated collectively) at any time.

Thermostat means a temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of 273.13(c)(2) or 273.33(c)(2).

Universal Waste means any of the following hazardous wastes that are subject to the universal waste requirements of part 273:

- (1) Batteries as described in 273.2;
- (2) Pesticides as described in 273.3;
- (3) Mercury-containing equipment as described in 273.4;
- (4) Lamps as described in 273.5; and
- (5) Aerosol cans as described in 273.6 of this chapter.

Universal Waste Handler:

- (1) Means:
 - (i) A generator (as defined in this section) of universal waste; or
 - (ii) The owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination facility, or to a foreign destination.
- (2) Does not mean:
 - (i) A person who treats (except under the provisions of 273.13(a) or (c), or 273.33(a) or (c)), disposes of, or recycles (except under the provisions of 273.13(e) or 273.33(e)) universal waste; or
 - (ii) A person engaged in the off-site transportation of universal waste by air, rail, highway, or water, including a universal waste transfer facility.

Universal Waste Transfer Facility means any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of universal waste are held during the normal course of transportation for ten days or less.

Universal Waste Transporter means a person engaged in the off-site transportation of universal waste by air, rail, highway, or water.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

SUBPART B
Standards for Small Quantity Handlers of Universal Waste

273.10. Applicability.

This subpart applies to small quantity handlers of universal waste (as defined in 273.9).

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; State Register Volume 24, Issue No. 8, eff August 25, 2000.

273.11. Prohibitions.

A small quantity handler of universal waste is:

- (a) Prohibited from disposing of universal waste; and
- (b) Prohibited from diluting or treating universal waste, except by responding to releases as provided in 273.17; or by managing specific wastes as provided in 273.13.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.12. Notification.

A small quantity handler of universal waste is not required to notify the Department of universal waste handling activities.

273.13. Waste management.

(a) Universal waste batteries: A small quantity handler of universal waste must manage universal waste batteries in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A small quantity handler of universal waste must contain any universal waste battery that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions in a container. The container must be closed, structurally sound, compatible with the contents of the battery, and must lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

(2) A small quantity handler of universal waste may conduct the following activities as long as the casing of each individual battery cell is not breached and remains intact and closed (except that cells may be opened to remove electrolyte but must be immediately closed after removal):

- (i) sorting batteries by type;
- (ii) mixing battery types in one container;
- (iii) discharging batteries so as to remove the electric charge;
- (iv) regenerating used batteries;
- (v) disassembling batteries or battery packs into individual batteries or cells;
- (vi) removing batteries from consumer products; or
- (vii) removing electrolyte from batteries.

(3) A small quantity handler of universal waste who removes electrolyte from batteries, or who generates other solid waste (e.g., battery pack materials, discarded consumer products) as a result of the activities listed above, must determine whether the electrolyte and/or other solid waste exhibit a characteristic of hazardous waste identified in part 261, subpart C.

(i) If the electrolyte and/or other solid waste exhibit a characteristic of hazardous waste, it is subject to all applicable requirements of parts 260 through 272. The handler is considered the generator of the hazardous electrolyte and/or other waste and is subject to part 262.

(ii) If the electrolyte or other solid waste is not hazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

(b) Universal waste pesticides. A small quantity handler of universal waste must manage universal waste pesticides in a way that prevents releases of any universal waste or component of a universal waste to the environment. The universal waste pesticides must be contained in one or more of the following:

(1) A container that remains closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions; or

(2) A container that does not meet the requirements of paragraph (1), provided that the unacceptable container is overpacked in a container that does meet the requirements of paragraph (1); or

(3) A tank that meets the requirements of part 265 subpart J, except for 265.197(c), 265.200, and 265.201; or

(4) A transport vehicle or vessel that is closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

(c) Mercury-containing equipment. A small quantity handler of universal waste must manage universal waste mercury-containing equipment in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A small quantity handler of universal waste must place in a container any universal waste mercury-containing equipment with non-contained elemental mercury or that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions. The container must be closed, structurally sound, compatible with the contents of the device, must lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and must be reasonably designed to prevent the escape of mercury into the environment by volatilization or any other means.

(2) A small quantity handler of universal waste may remove mercury-containing ampules from universal waste mercury-containing equipment provided the handler:

(i) Removes and manages the ampules in a manner designed to prevent breakage of the ampules;

(ii) Removes the ampules only over or in a containment device (e.g., tray or pan sufficient to collect and contain any mercury released from an ampule in case of breakage);

(iii) Ensures that a mercury clean-up system is readily available to immediately transfer any mercury resulting from spills or leaks from broken ampules from that containment device to a container that is subject to all applicable requirements of parts 260 through 270;

(iv) Immediately transfers any mercury resulting from spills or leaks from broken ampules from the containment device to a container that is subject to all applicable requirements of parts 260 through 270;

(v) Ensures that the area in which ampules are removed is well ventilated and monitored to ensure compliance with applicable OSHA exposure levels for mercury;

(vi) Ensures that employees removing ampules are thoroughly familiar with proper waste mercury handling and emergency procedures, including transfer of mercury from containment devices to appropriate containers;

(vii) Stores removed ampules in closed, non-leaking containers that are in good condition;

(viii) Packs removed ampules in the container with packing materials adequate to prevent breakage during storage, handling, and transportation;

(3) A small quantity handler of universal waste mercury-containing equipment that does not contain an ampule may remove the open original housing holding the mercury from universal waste mercury-containing equipment provided the handler:

(i) Immediately seals the original housing holding the mercury with an air-tight seal to prevent the release of any mercury to the environment; and

(ii) Follows all requirements for removing ampules and managing removed ampules under paragraph (c)(2) of this section; and

(4)(i) A small quantity handler of universal waste who removes mercury-containing ampules from mercury-containing equipment or seals mercury from mercury-containing equipment in its original housing must determine whether the following exhibit a characteristic of hazardous waste identified in part 261, subpart C:

(A) Mercury or clean-up residues resulting from spills or leaks and/or

(B) Other solid waste generated as a result of the removal of mercury-containing ampules or housings (e.g., the remaining mercury-containing device).

(ii) If the mercury, residues, and/or other solid waste exhibits a characteristic of hazardous waste, it must be managed in compliance with all applicable requirements of parts 260 through 272. The handler is considered the generator of the mercury, residues, and/or other waste and must manage it in compliance with part 262.

(iii) If the mercury, residues, and/or other solid waste is not hazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

(d) Lamps. A small quantity handler of universal waste must manage lamps in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A small quantity handler of universal waste must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Such containers and packages must remain closed and must lack evidence of leakage, spillage or damage that could cause leakage under reasonably foreseeable conditions.

(2) A small quantity handler of universal waste must immediately clean up and place in a container any lamp that is broken and must place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment. Containers must be closed, structurally sound, compatible with the contents of the lamps and must lack evidence of leakage, spillage or damage that could cause leakage or releases of mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

(e) Aerosol cans. A small quantity handler of universal waste must manage universal waste aerosol cans in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) Universal waste aerosol cans must be accumulated in a container that is structurally sound, compatible with the contents of the aerosol cans, lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and is protected from sources of heat.

(2) Universal waste aerosol cans that show evidence of leakage must be packaged in a separate closed container or overpacked with absorbents, or immediately punctured and drained in accordance with the requirements of paragraph (e)(4) of this section.

(3) A small quantity handler of universal waste may conduct the following activities as long as each individual aerosol can is not breached and remains intact:

(i) Sorting aerosol cans by type;

(ii) Mixing intact cans in one container;

(iii) Removing actuators to reduce the risk of accidental release; and

(4) A small quantity handler of universal waste who punctures and drains their aerosol cans must recycle the empty punctured aerosol cans and meet the following requirements while puncturing and draining universal waste aerosol cans:

(i) Conduct puncturing and draining activities using a device specifically designed to safely puncture aerosol cans and effectively contain the residual contents and any emissions thereof.

(ii) Establish and follow a written procedure detailing how to safely puncture and drain the universal waste aerosol can (including proper assembly, operation and maintenance of the unit, segregation of incompatible wastes, and proper waste management practices to prevent fires or releases); maintain a copy of the manufacturer's specification and instruction on site; and ensure employees operating the device are trained in the proper procedures.

(iii) Ensure that puncturing of the can is done in a manner designed to prevent fires and to prevent the release of any component of universal waste to the environment. This manner includes, but is not limited to, locating the equipment on a solid, flat surface in a well-ventilated area.

(iv) Immediately transfer the contents from the waste aerosol can or puncturing device, if applicable, to a container or tank that meets the applicable requirements of 262.14, 262.15, 262.16, or 262.17.

(v) Conduct a hazardous waste determination on the contents of the emptied aerosol can per 262.11. Any hazardous waste generated as a result of puncturing and draining the aerosol can is subject to all applicable requirements of parts 260 through 272. The handler is considered the generator of the hazardous waste and is subject to part 262.

(vi) If the contents are determined to be nonhazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state, or local solid waste regulations.

(vii) A written procedure must be in place in the event of a spill or leak and a spill clean-up kit must be provided. All spills or leaks of the contents of the aerosol cans must be cleaned up promptly.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021; SCSR 46-5 Doc. No. 5058, eff May 27, 2022.

273.14. Labeling/marketing.

A small quantity handler of universal waste must label or mark the universal waste to identify the type of universal waste as specified below:

(a) Universal waste batteries (i.e., each battery), or a container in which the batteries are contained, must be labeled or marked clearly with any one of the following phrases: "Universal Waste -Battery(ies)," or "Waste Battery(ies)," or "Used Battery(ies);"

(b) A container, (or multiple container package unit), tank, transport vehicle or vessel in which recalled universal waste pesticides as described in 273.3(a)(1) are contained must be labeled or marked clearly with:

(1) The label that was on or accompanied the product as sold or distributed; and

(2) The words "Universal Waste -Pesticide(s)" or "Waste -Pesticide(s);"

(c) A container, tank, or transport vehicle or vessel in which unused pesticide products as described in 273.3(a)(2) are contained must be labeled or marked clearly with:

(1)(i) The label that was on the product when purchased, if still legible;

(ii) If using the labels described in paragraph (1)(i) is not feasible, the appropriate label as required under the Department of Transportation regulation 49 CFR part 172;

(iii) If using the labels described in paragraphs (1)(i) and (1)(ii) is not feasible, another label prescribed or designated by the waste pesticide collection program administered or recognized by a state; and

(2) The words "Universal Waste -Pesticide(s)" or "Waste -Pesticide(s)."

(d)(1) Universal waste mercury-containing equipment (i.e., each device), or a container in which the equipment is contained, must be labeled or marked clearly with any of the following phrases: "Universal Waste - Mercury Containing Equipment," "Waste Mercury-Containing Equipment," or "Used Mercury-Containing Equipment."

(2) A universal waste mercury-containing thermostat or container containing only universal waste mercury-containing thermostats may be labeled or marked clearly with any of the following phrases: "Universal Waste - Waste Mercury Thermostat(s), or "Used Mercury Thermostat(s)."

(e) Each lamp or a container or package in which such lamps are contained must be labeled or marked clearly with one of the following phrases: "Universal Waste - Lamp(s)," or "Waste Lamp(s)," or "Used Lamp(s)."

(f) Universal waste aerosol cans (i.e., each aerosol can), or a container in which the aerosol cans are contained, must be labeled or marked clearly with any of the following phrases: "Universal Waste-Aerosol Can(s)," "Waste Aerosol Can(s)," or "Used Aerosol Can(s)."

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.15. Accumulation time limits.

(a) A small quantity handler of universal waste may accumulate universal waste for no longer than one year from the date the universal waste is generated, or received from another handler, unless the requirements of paragraph (b) are met.

(b) A small quantity handler of universal waste may accumulate universal waste for longer than one year from the date the universal waste is generated, or received from another handler, if such activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal. However, the handler bears the burden of proving that such activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal.

(c) A small quantity handler of universal waste who accumulates universal waste must be able to demonstrate the length of time that the universal waste has been accumulated from the date it becomes a waste or is received. The handler may make this demonstration by:

(1) Placing the universal waste in a container and marking or labeling the container with the earliest date that any universal waste in the container became a waste or was received;

(2) Marking or labeling each individual item of universal waste (e.g., each battery or thermostat) with the date it became a waste or was received;

(3) Maintaining an inventory system on-site that identifies the date each universal waste became a waste or was received;

(4) Maintaining an inventory system on-site that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste or was received;

(5) Placing the universal waste in a specific accumulation area and identifying the earliest date that any universal waste in the area became a waste or was received; or

(6) Any other method which clearly demonstrates the length of time that the universal waste has been accumulated from the date it becomes a waste or is received.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.16. Employee training.

A small quantity handler of universal waste must inform all employees who handle or have responsibility for managing universal waste. The information must describe proper handling and emergency procedures appropriate to the type(s) of universal waste handled at the facility.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.17. Response to releases.

(a) A small quantity handler of universal waste must immediately contain all releases of universal wastes and other residues from universal wastes.

(b) A small quantity handler of universal waste must determine whether any material resulting from the release is hazardous waste, and if so, must manage the hazardous waste in compliance with all applicable requirements of parts 260 through 272. The handler is considered the generator of the material resulting from the release, and must manage it in compliance with part 262.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.18. Off-site shipments.

(a) A small quantity handler of universal waste is prohibited from sending or taking universal waste to a place other than another universal waste handler, a destination facility, or a foreign destination.

(b) If a small quantity handler of universal waste self-transportes universal waste off-site, the handler becomes a universal waste transporter for those self-transportation activities and must comply with the transporter requirements of subpart D of this part while transporting the universal waste.

(c) If a universal waste being offered for off-site transportation meets the definition of hazardous materials under 49 CFR 171-180, a small quantity handler of universal waste must package, label,

mark and placard the shipment, and prepare the proper shipping papers in accordance with the applicable Department of Transportation regulations under 49 CFR parts 172-180;

(d) Prior to sending a shipment of universal waste to another universal waste handler, the originating handler must ensure that the receiving handler agrees to receive the shipment.

(e) If a small quantity handler of universal waste sends a shipment of universal waste to another handler or to a destination facility and the shipment is rejected by the receiving handler or destination facility, the originating handler must either:

- (1) Receive the waste back when notified that the shipment has been rejected, or
- (2) Agree with the receiving handler on a destination facility to which the shipment will be sent.

(f) A small quantity handler of universal waste may reject a shipment containing universal waste, or a portion of a shipment containing universal waste that he has received from another handler. If a handler rejects a shipment or a portion of a shipment, he must contact the originating handler to notify him of the rejection and to discuss reshipment of the load. The handler must:

- (i) Send the shipment back to the originating handler, or
- (ii) If agreed to by both the originating and receiving handler, send the shipment to a destination facility.

(g) If a small quantity handler of universal waste receives a shipment containing hazardous waste that is not a universal waste, the handler must immediately notify the Department of the illegal shipment, and provide the name, address, and phone number of the originating shipper. The Department will provide instructions for managing the hazardous waste.

(h) If a small quantity handler of universal waste receives a shipment of non-hazardous, non-universal waste, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

273.19. Tracking universal waste shipments.

A small quantity handler of universal waste is not required to keep records of shipments of universal waste.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.20. Exports.

A small quantity handler of universal waste who sends universal waste to a foreign destination is subject to the requirements of part 262, subpart H.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

SUBPART C

Standards for Large Quantity Handlers of Universal Waste

273.30. Applicability.

This subpart applies to large quantity handlers of universal waste as defined in 273.9.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

273.31. Prohibitions.

A large quantity handler of universal waste is:

- (a) Prohibited from disposing of universal waste; and
- (b) Prohibited from diluting or treating universal waste, except by responding to releases as provided in 273.37; or by managing specific wastes as provided in 273.33.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.32. Notification.

(a)(1) Except as provided in paragraphs (a)(2) and (3) of this section, a large quantity handler of universal waste must have sent written notification of universal waste management to the Department,

and received an EPA Identification Number, before meeting or exceeding the 5,000 kilogram storage limit.

(2) A large quantity handler of universal waste who has already notified the Department of his hazardous waste management activities and has received an EPA Identification Number is not required to renotify under this section.

(3) A large quantity handler of universal waste who manages recalled universal waste pesticides as described in 273.3(a)(1) and who has sent notification to the EPA as required by 40 CFR part 165 is not required to notify for those recalled universal waste pesticides under this section.

(b) This notification must include:

(1) The universal waste handler's name and mailing address;

(2) The name and business telephone number of the person at the universal waste handler's site who should be contacted regarding universal waste management activities;

(3) The address or physical location of the universal waste management activities;

(4) A list of all the types of universal waste managed by the handler (e.g., batteries, pesticides, mercury-containing equipment, lamps, and aerosol cans); and

(5) A statement indicating that the handler is accumulating more than 5,000 kilograms of universal waste at one time.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.33. Waste management.

(a) Universal waste batteries: A large quantity handler of universal waste must manage universal waste batteries in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A large quantity handler of universal waste must contain any universal waste battery that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions in a container. The container must be closed, structurally sound, compatible with the contents of the battery, and must lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

(2) A large quantity handler of universal waste may conduct the following activities as long as the casing of each individual battery cell is not breached and remains intact and closed (except that cells may be opened to remove electrolyte but must be immediately closed after removal):

(i) sorting batteries by type;

(ii) mixing battery types in one container;

(iii) discharging batteries so as to remove the electric charge;

(iv) regenerating used batteries;

(v) disassembling batteries or battery packs into individual batteries or cells;

(vi) removing batteries from consumer products; or

(vii) removing electrolyte from batteries.

(3) A large quantity handler of universal waste who removes electrolyte from batteries, or who generates other solid waste (e.g., battery pack materials, discarded consumer products) as a result of the activities listed above, must determine whether the electrolyte and/or other solid waste exhibit a characteristic of hazardous waste identified in part 261, subpart C.

(i) If the electrolyte and/or other solid waste exhibit a characteristic of hazardous waste, it must be managed in compliance with all applicable requirements of parts 260 through 272. The handler is considered the generator of the hazardous electrolyte and/or other waste and is subject to part 262.

(ii) If the electrolyte or other solid waste is not hazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

(b) Universal waste pesticides: A large quantity handler of universal waste must manage universal waste pesticides in a way that prevents releases of any universal waste or component of a universal waste to the environment. The universal waste pesticides must be contained in one or more of the following:

(1) A container that remains closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions; or

(2) A container that does not meet the requirements of paragraph (1), provided that the unacceptable container is overpacked in a container that does meet the requirements of paragraph (1); or

(3) A tank that meets the requirements of part 265 subpart J, except for 265.197(c), 265.200, and 265.201; or

(4) A transport vehicle or vessel that is closed, structurally sound, compatible with the pesticide, and that lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions.

(c) Mercury-containing equipment. A large quantity handler of universal waste must manage universal waste mercury-containing equipment in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A large quantity handler of universal waste must place in a container any universal waste mercury-containing equipment with non-contained elemental mercury or that shows evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions. The container must be closed, structurally sound, compatible with the contents of the device, must lack evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and must be reasonably designed to prevent the escape of mercury into the environment by volatilization or any other means.

(2) A large quantity handler of universal waste may remove mercury-containing ampules from universal waste mercury-containing equipment provided the handler:

(i) Removes and manages the ampules in a manner designed to prevent breakage of the ampules;

(ii) Removes the ampules only over or in a containment device (e.g., tray or pan sufficient to collect and contain any mercury released from an ampule in case of breakage);

(iii) Ensures that a mercury clean-up system is readily available to immediately transfer any mercury resulting from spills or leaks of broken ampules from that containment device to a container that is subject to all applicable requirements of parts 260 through 272;

(iv) Immediately transfers any mercury resulting from spills or leaks from broken ampules from the containment device to a container that is subject to all applicable requirements of parts 260 through 272;

(v) Ensures that the area in which ampules are removed is well ventilated and monitored to ensure compliance with applicable OSHA exposure levels for mercury;

(vi) Ensures that employees removing ampules are thoroughly familiar with proper waste mercury handling and emergency procedures, including transfer of mercury from containment devices to appropriate containers;

(vii) Stores removed ampules in closed, non-leaking containers that are in good condition;

(viii) Packs removed ampules in the container with packing materials adequate to prevent breakage during storage, handling, and transportation;

(3) A large quantity handler of universal waste mercury-containing equipment that does not contain an ampule may remove the open original housing holding the mercury from universal waste mercury-containing equipment provided the handler:

(i) Immediately seals the original housing holding the mercury with an air-tight seal to prevent the release of any mercury to the environment; and

(ii) Follows all requirements for removing ampules and managing removed ampules under paragraph (c)(2) of this section; and

(4)(i) A large quantity handler of universal waste who removes mercury-containing ampules from mercury-containing equipment or seals mercury from mercury-containing equipment in its original housing must determine whether the following exhibit a characteristic of hazardous waste identified in part 261, subpart C:

(A) Mercury-or clean-up residues resulting from spills or leaks and/or

(B) Other solid waste generated as a result of the removal of mercury-containing ampules or housings (e.g., the remaining mercury-containing device).

(ii) If the mercury, residues, and/or other solid waste exhibits a characteristic of hazardous waste, it must be managed in compliance with all applicable requirements of parts 260 through 272. The handler is considered the generator of the mercury, residues, and/or other waste and must manage it in compliance with part 262.

(iii) If the mercury, residues, and/or other solid waste is not hazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

(d) Lamps. A large quantity handler of universal waste must manage lamps in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) A large quantity handler of universal waste must contain any lamp in containers or packages that are structurally sound, adequate to prevent breakage, and compatible with the contents of the lamps. Such containers and packages must remain closed and must lack evidence of leakage, spillage or damage that could cause leakage under reasonably foreseeable conditions.

(2) A large quantity handler of universal waste must immediately clean up and place in a container any lamp that is broken and must place in a container any lamp that shows evidence of breakage, leakage, or damage that could cause the release of mercury or other hazardous constituents to the environment. Containers must be closed, structurally sound, compatible with the contents of the lamps and must lack evidence of leakage, spillage or damage that could cause leakage or releases of mercury or other hazardous constituents to the environment under reasonably foreseeable conditions.

(e) Aerosol cans. A large quantity handler of universal waste must manage universal waste aerosol cans in a way that prevents releases of any universal waste or component of a universal waste to the environment, as follows:

(1) Universal waste aerosol cans must be accumulated in a container that is structurally sound, compatible with the contents of the aerosol cans, lacks evidence of leakage, spillage, or damage that could cause leakage under reasonably foreseeable conditions, and is protected from sources of heat.

(2) Universal waste aerosol cans that show evidence of leakage must be packaged in a separate closed container or overpacked with absorbents, or immediately punctured and drained in accordance with the requirements of paragraph (e)(4) of this section.

(3) A large quantity handler of universal waste may conduct the following activities as long as each individual aerosol can is not breached and remains intact:

(i) Sorting aerosol cans by type;

(ii) Mixing intact cans in one container;

(iii) Removing actuators to reduce the risk of accidental release; and

(4) A large quantity handler of universal waste who punctures and drains their aerosol cans must recycle the empty punctured aerosol cans and meet the following requirements while puncturing and draining universal waste aerosol cans:

(i) Conduct puncturing and draining activities using a device specifically designed to safely puncture aerosol cans and effectively contain the residual contents and any emissions thereof.

(ii) Establish and follow a written procedure detailing how to safely puncture and drain the universal waste aerosol can (including proper assembly, operation and maintenance of the unit, segregation of incompatible wastes, and proper waste management practices to prevent fires or releases); maintain a copy of the manufacturer's specification and instruction on site; and ensure employees operating the device are trained in the proper procedures.

(iii) Ensure that puncturing of the can is done in a manner designed to prevent fires and to prevent the release of any component of universal waste to the environment. This includes, but is not limited to, locating the equipment on a solid, flat surface in a well-ventilated area.

(iv) Immediately transfer the contents from the waste aerosol can or puncturing device, if applicable, to a container or tank that meets the applicable requirements of 262.14, 262.15, 262.16, or 262.17.

(v) Conduct a hazardous waste determination on the contents of the emptied aerosol can per 262.11. Any hazardous waste generated as a result of puncturing and draining the aerosol can is subject to all applicable requirements of parts 260 through 272. The handler is considered the generator of the hazardous waste and is subject to part 262.

(vi) If the contents are determined to be nonhazardous, the handler may manage the waste in any way that is in compliance with applicable federal, state, or local solid waste regulations.

(vii) A written procedure must be in place in the event of a spill or leak and a spill clean-up kit must be provided. All spills or leaks of the contents of the aerosol cans must be cleaned up promptly.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.34. Labeling/marketing.

A large quantity handler of universal waste must label or mark the universal waste to identify the type of universal waste as specified below:

(a) Universal waste batteries (i.e., each battery), or a container or tank in which the batteries are contained, must be labeled or marked clearly with any one of the following phrases: "Universal Waste -Battery(ies)," or "Waste Battery(ies)," or "Used Battery(ies);"

(b) A container (or multiple container package unit), tank, transport vehicle or vessel in which recalled universal waste pesticides as described in 273.3(a)(1) are contained must be labeled or marked clearly with:

(1) The label that was on or accompanied the product as sold or distributed; and

(2) The words "Universal Waste -Pesticide(s)" or "Waste -Pesticide(s);"

(c) A container, tank, or transport vehicle or vessel in which unused pesticide products as described in 273.3(a)(2) are contained must be labeled or marked clearly with:

(1)(i) The label that was on the product when purchased, if still legible;

(ii) If using the labels described in paragraph (1)(i) is not feasible, the appropriate label as required under the Department of Transportation regulation 49 CFR part 172;

(iii) If using the labels described in paragraphs (1)(i) and (1)(ii) is not feasible, another label prescribed or designated by the pesticide collection program; and

(2) The words "Universal Waste -Pesticide(s)" or "Waste -Pesticide(s)."

(d)(1) Mercury-containing equipment (i.e., each device), or a container in which the equipment is contained, must be labeled or marked clearly with any of the following phrases: "Universal Waste-Mercury Containing Equipment," "Waste Mercury-Containing Equipment," or "Used Mercury-Containing Equipment."

(2) A universal waste mercury-containing thermostat or container containing only universal waste mercury-containing thermostats may be labeled or marked clearly with any of the following phrases: "Universal Waste-Mercury Thermostat(s)," "Waste Mercury Thermostat(s)," or "Used Mercury Thermostat(s)."

(e) Each lamp or a container or package in which such lamps are contained must be labeled or marked clearly with any one of the following phrases: "Universal Waste - Lamp(s)," or "Waste Lamp(s)," or "Used Lamp(s)."

(f) Universal waste aerosol cans (i.e., each aerosol can), or a container in which the aerosol cans are contained, must be labeled or marked clearly with any of the following phrases: "Universal Waste-Aerosol Can(s)," "Waste Aerosol Can(s)," or "Used Aerosol Can(s)."

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; State Register Volume 31, Issue No. 6, eff June 22, 2007; SCSR 45-5 Doc. No. 4975, eff May 28, 2021.

273.35. Accumulation time limits.

(a) A large quantity handler of universal waste may accumulate universal waste for no longer than one year from the date the universal waste is generated, or received from another handler, unless the requirements of paragraph (b) are met.

(b) A large quantity handler of universal waste may accumulate universal waste for longer than one year from the date the universal waste is generated, or received from another handler, if such activity is solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal. However, the handler bears the burden of proving that such activity was solely for the purpose of accumulation of such quantities of universal waste as necessary to facilitate proper recovery, treatment, or disposal.

(c) A large quantity handler of universal waste must be able to demonstrate the length of time that the universal waste has been accumulated from the date it becomes a waste or is received. The handler may make this demonstration by:

(1) Placing the universal waste in a container and marking or labeling the container with the earliest date that any universal waste in the container became a waste or was received;

(2) Marking or labeling the individual item of universal waste (e.g., each battery or thermostat) with the date it became a waste or was received;

(3) Maintaining an inventory system on-site that identifies the date the universal waste being accumulated became a waste or was received;

(4) Maintaining an inventory system on-site that identifies the earliest date that any universal waste in a group of universal waste items or a group of containers of universal waste became a waste or was received;

(5) Placing the universal waste in a specific accumulation area and identifying the earliest date that any universal waste in the area became a waste or was received; or

(6) Any other method which clearly demonstrates the length of time that the universal waste has been accumulated from the date it becomes a waste or is received.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.36. Employee training.

A large quantity handler of universal waste must ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures, relative to their responsibilities during normal facility operations and emergencies.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.37. Response to releases.

(a) A large quantity handler of universal waste must immediately contain all releases of universal wastes and other residues from universal wastes.

(b) A large quantity handler of universal waste must determine whether any material resulting from the release is hazardous waste, and if so, must manage the hazardous waste in compliance with all applicable requirements of parts 260 through 272. The handler is considered the generator of the material resulting from the release, and is subject to part 262.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.38. Off-site shipments.

(a) A large quantity handler of universal waste is prohibited from sending or taking universal waste to a place other than another universal waste handler, a destination facility, or a foreign destination.

(b) If a large quantity handler of universal waste self-transport universal waste off-site, the handler becomes a universal waste transporter for those self-transportation activities and must comply with the transporter requirements of subpart D of this part while transporting the universal waste.

(c) If a universal waste being offered for off-site transportation meets the definition of hazardous materials under 49 CFR 171-180, a large quantity handler of universal waste must package, label, mark and placard the shipment, and prepare the proper shipping papers in accordance with the applicable Department of Transportation regulations under 49 CFR parts 172-180;

(d) Prior to sending a shipment of universal waste to another universal waste handler, the originating handler must ensure that the receiving handler agrees to receive the shipment.

(e) If a large quantity handler of universal waste sends a shipment of universal waste to another handler or to a destination facility and the shipment is rejected by the receiving handler or destination facility, the originating handler must either:

- (1) Receive the waste back when notified that the shipment has been rejected, or
- (2) Agree with the receiving handler on a destination facility to which the shipment will be sent.

(f) A large quantity handler of universal waste may reject a shipment containing universal waste, or a portion of a shipment containing universal waste that he has received from another handler. If a handler rejects a shipment or a portion of a shipment, he must contact the originating handler to notify him of the rejection and to discuss reshipment of the load. The handler must:

- (i) Send the shipment back to the originating handler, or
- (ii) If agreed to by both the originating and receiving handler, send the shipment to a destination facility.

(g) If a large quantity handler of universal waste receives a shipment containing hazardous waste that is not a universal waste, the handler must immediately notify the Department of the illegal shipment, and provide the name, address, and phone number of the originating shipper. The Department will provide instructions for managing the hazardous waste.

(h) If a large quantity handler of universal waste receives a shipment of non-hazardous, non-universal waste, the handler may manage the waste in any way that is in compliance with applicable federal, state or local solid waste regulations.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.39. Tracking universal waste shipments.

(a) Receipt of shipments. A large quantity handler of universal waste must keep a record of each shipment of universal waste received at the facility. The record may take the form of a log, invoice, manifest, bill of lading, movement document or other shipping document. The record for each shipment of universal waste received must include the following information:

- (1) The name and address of the originating universal waste handler or foreign shipper from whom the universal waste was sent;
- (2) The quantity of each type of universal waste received (e.g., batteries, pesticides, thermostats);
- (3) The date of receipt of the shipment of universal waste.

(b) Shipments off-site. A large quantity handler of universal waste must keep a record of each shipment of universal waste sent from the handler to other facilities. The record may take the form of a log, invoice, manifest, bill of lading, movement document or other shipping document. The record for each shipment of universal waste sent must include the following information:

- (1) The name and address of the universal waste handler, destination facility, or foreign destination to whom the universal waste was sent;
- (2) The quantity of each type of universal waste sent (e.g., batteries, pesticides, thermostats);
- (3) The date the shipment of universal waste left the facility.

(c) Record retention.

- (1) A large quantity handler of universal waste must retain the records described in paragraph (a) of this section for at least three years from the date of receipt of a shipment of universal waste.

(2) A large quantity handler of universal waste must retain the records described in paragraph (b) of this section for at least three years from the date a shipment of universal waste left the facility.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

273.40. Exports.

A large quantity handler of universal waste who sends universal waste to a foreign destination is subject to the requirements of part 262, subpart H.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

SUBPART D *Standards for Universal Waste Transporters*

273.50. Applicability.

This subpart applies to universal waste transporters (as defined in 273.9).

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; amended by State Register Volume 24, Issue No. 8, August 25, 2000.

273.51. Prohibitions.

A universal waste transporter is:

- (a) Prohibited from disposing of universal waste; and
- (b) Prohibited from diluting or treating universal waste, except by responding to releases as provided in 273.54.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.52. Waste management.

(a) A universal waste transporter must comply with all applicable U.S. Department of Transportation regulations in 49 CFR part 171 through 180 for transport of any universal waste that meets the definition of hazardous material in 49 CFR 171.8. For purposes of the Department of Transportation regulations, a material is considered a hazardous waste if it is subject to the Hazardous Waste Manifest Requirements of the U.S. Environmental Protection Agency/South Carolina Hazardous Waste Management Regulations specified in 40 CFR 262/R.61-79.262. Because universal waste does not require a hazardous waste manifest, it is not considered hazardous waste under the Department of Transportation regulations.

(b) Some universal waste materials are regulated by the Department of Transportation as hazardous materials because they meet the criteria for one or more hazard classes specified in 49 CFR 173.2. As universal waste shipments do not require a manifest under 262, they may not be described by the DOT proper shipping name "hazardous waste, (l) or (s), n.o.s.", nor may the hazardous material's proper shipping name be modified by adding the word "waste".

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.53. Storage time limits.

(a) A universal waste transporter may only store the universal waste at a universal waste transfer facility for ten days or less.

(b) If a universal waste transporter stores universal waste for more than ten days, the transporter becomes a universal waste handler and must comply with the applicable requirements of subparts B or C of this part while storing the universal waste.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.54. Response to releases.

(a) A universal waste transporter must immediately contain all releases of universal wastes and other residues from universal wastes.

(b) A universal waste transporter must determine whether any material resulting from the release is hazardous waste, and if so, it is subject to all applicable requirements of parts 260 through 272. If the waste is determined to be a hazardous waste, the transporter is subject to part 262.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.55. Off-site shipments.

(a) A universal waste transporter is prohibited from transporting the universal waste to a place other than a universal waste handler, a destination facility, or a foreign destination.

(b) If the universal waste being shipped off-site meets the Department of Transportation's definition of hazardous materials under 49 CFR 171.8, the shipment must be properly described on a shipping paper in accordance with the applicable Department of Transportation regulations under 49 CFR part 172.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.56. Exports.

A universal waste transporter transporting a shipment of universal waste to a foreign destination is subject to the requirements of part 262, subpart H.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 42-12 Doc. No. 4840, eff December 28, 2018.

SUBPART E *Standards for Destination Facilities*

273.60. Applicability.

(a) The owner or operator of a destination facility (as defined in 273.9) is subject to all applicable requirements of parts 264, 265, 266, 268, 270, and 272 of this chapter, and the notification requirement under 44-56-20 of the South Carolina Hazardous Waste Management Act and section 3010 of RCRA.

(b) The owner or operator of a destination facility that recycles a particular universal waste without storing that universal waste before it is recycled must comply with 261.6(c)(2).

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000.

273.61. Off-site shipments.

(a) The owner or operator of a destination facility is prohibited from sending or taking universal waste to a place other than a universal waste handler, another destination facility or foreign destination.

(b) The owner or operator of a destination facility may reject a shipment containing universal waste, or a portion of a shipment containing universal waste. If the owner or operator of the destination facility rejects a shipment or a portion of a shipment, he must contact the shipper to notify him of the rejection and to discuss reshipment of the load. The owner or operator of the destination facility must:

- (1) Send the shipment back to the original shipper, or
- (2) If agreed to by both the shipper and the owner or operator of the destination facility, send the shipment to another destination facility.

(c) If the owner or operator of a destination facility receives a shipment containing hazardous waste that is not a universal waste, the owner or operator of the destination facility must immediately notify the Department of the illegal shipment, and provide the name, address, and phone number of the shipper. The Department will provide instructions for managing the hazardous waste.

(d) If the owner or operator of a destination facility receives a shipment of non-hazardous, non-universal waste, the owner or operator may manage the waste in any way that is in compliance with applicable federal or state solid waste regulations.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996.

273.62. Tracking universal waste shipments.

(a) The owner or operator of a destination facility must keep a record of each shipment of universal waste received at the facility. The record may take the form of a log, invoice, manifest, bill of lading, movement document or other shipping document. The record for each shipment of universal waste received must include the following information:

- (1) The name and address of the universal waste handler, destination facility, or foreign shipper from whom the universal waste was sent;
- (2) The quantity of each type of universal waste received (e.g., batteries, pesticides, thermostats);
- (3) The date of receipt of the shipment of universal waste.

(b) The owner or operator of a destination facility must retain the records described in paragraph (a) of this section for at least three years from the date of receipt of a shipment of universal waste.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996. Amended by SCSR 42–12 Doc. No. 4840, eff December 28, 2018.

SUBPART F ***Import Requirements***

273.70. Imports.

Persons managing universal waste that is imported from a foreign country into the United States are subject to the requirements of part 262, subpart H, and the applicable requirements of this part, immediately after the waste enters the United States, as indicated in paragraphs (a) through (c) of this section:

- (a) A universal waste transporter is subject to the universal waste transporter requirements of subpart D of this part.
- (b) A universal waste handler is subject to the small or large quantity handler of universal waste requirements of subparts B or C, as applicable.
- (c) An owner or operator of a destination facility is subject to the destination facility requirements of subpart E of this part.
- (d) Persons managing universal waste that is imported from an OECD country as specified in 262.58(a)(1) are subject to paragraphs (a) through (c) of this section, in addition to the requirements of 262, subpart H.

HISTORY: Amended by SCSR 42–12 Doc. No. 4840, eff December 28, 2018.

SUBPART G ***Petitions to Include Other Wastes under 40 CFR Part 273***

273.80. General.

(a) Except as provided in paragraph (d) of this section, any person seeking to add a hazardous waste or a category of hazardous waste to this part may petition for a regulatory amendment under this subpart and 260.20 and 260.23.

(b) To be successful, the petitioner must demonstrate to the satisfaction of the Administrator that regulation under the universal waste regulations of 40 CFR part 273 is: appropriate for the waste or category of waste; will improve management practices for the waste or category of waste; and will improve implementation of the hazardous waste program. The petition must include the information required by 40 CFR 260.20(b). The petition should also address as many of the factors listed in 40 CFR 273.81 as are appropriate for the waste or waste category addressed in the petition.

(c) The Administrator will evaluate petitions using the factors listed in 40 CFR 273.81. The Administrator will grant or deny a petition using the factors listed in 40 CFR 273.81. The decision will be based on the weight of evidence showing that regulation under 40 CFR part 273 is appropriate for the waste or category of waste, will improve management practices for the waste or category of waste, and will improve implementation of the hazardous waste program.

(d) Hazardous waste pharmaceuticals are regulated by part 266, subpart P and may not be added as a category of hazardous waste for management under this part.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 22, Issue No. 9, Part 2, eff September 25, 1998; SCSR 44–11 Doc. No. 4976, eff November 27, 2020.

273.81. Factors for Petitions to Include Other Wastes under 40 CFR Part 273.

(a) The waste or category of waste, as generated by a wide variety of generators, is listed in subpart D of part 261 of this chapter, or (if not listed) a proportion of the waste stream exhibits one or more characteristics of hazardous waste identified in subpart C of part 261 of this chapter. (When a characteristic waste is added to the universal waste regulations of this part 273 by using a generic name to identify the waste category (e.g., hazardous waste batteries), the definition of universal waste in 260.10 of this chapter and 273.9 will be amended to include only the hazardous waste portion of the waste category (e.g., hazardous waste batteries).) Thus, only the portion of the waste stream that does exhibit one or more characteristics (i.e., is hazardous waste) is subject to the universal waste regulations of this part 273;

(b) The waste or category of waste is not exclusive to a specific industry or group of industries, is commonly generated by a wide variety of types of establishments (including, for example, households, retail and commercial businesses, office complexes, very small quantity generators, small businesses, government organizations, as well as large industrial facilities);

(c) The waste or category of waste is generated by a large number of generators (e.g., more than 1,000 nationally) and is frequently generated in relatively small quantities by each generator;

(d) Systems to be used for collecting the waste or category of waste (including packaging, marking, and labeling practices) would ensure close stewardship of the waste;

(e) The risk posed by the waste or category of waste during accumulation and transport is relatively low compared to other hazardous wastes, and specific management standards proposed or referenced by the petitioner (e.g., waste management requirements appropriate to be added to 40 CFR 273.13, 273.33, and 273.52; and/or applicable Department of Transportation requirements) would be protective of human health and the environment during accumulation and transport;

(f) Regulation of the waste or category of waste under part 273 will increase the likelihood that the waste will be diverted from non-hazardous waste management systems (e.g, the municipal waste stream, non-hazardous industrial or commercial waste stream, municipal sewer or stormwater systems) to recycling, treatment, or disposal in compliance with Subtitle C of RCRA.

(g) Regulation of the waste or category of waste under 40 CFR part 273 will improve implementation of and compliance with the hazardous waste regulatory program; and/or

(h) Such other factors as may be appropriate.

HISTORY: Added by State Register Volume 20, Issue No. 5, eff May 24, 1996; Amended by State Register Volume 24, Issue No. 8, eff August 25, 2000; SCSR 43-5 Doc. No. 4841, eff May 24, 2019.