

# 61-62.5

## Standard No. 3.1

### Hospital/Medical/Infectious Waste Incinerators (HMIWI)

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## **Section I - Applicability and General Requirements.**

- (a) This standard applies to any device, regardless of type or construction, which combusts hospital/medical/infectious waste.
- (b) This standard is not applicable to crematory incinerators.
- (c) Beginning September 15, 2000, existing facilities subject to this standard and not listed as an exempt source for 40 Code of Federal Regulations (CFR) 60 Subpart Ec, Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced After June 20, 1996 (September 15, 1997, 60 FR 48348), shall operate pursuant to a Title V permit issued by the Department.
- (d) An owner or operator shall not combust hospital/medical/infectious waste except in a multiple-chamber incinerator with a solid hearth, or in a device found to be equally effective for the purpose of air contaminant control as an approved multiple-chamber incinerator as determined by the Department.
- (e) Physical or operational changes to an existing HMIWI unit, for which construction was commenced on or before June 20, 1996, that are made solely for the purpose of complying with this standard are not considered a modification and do not result in an existing HMIWI unit becoming subject to the provisions of 40 CFR 60 Subpart Ec, Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced After June 20, 1996 (September 15, 1997, 60 FR 48348).
- (f) All HMIWI are subject to this standard. Those HMIWI for which construction or reconstruction commenced after June 20, 1996, are also subject to the provisions of 40 CFR 60 Subpart Ec, Standards of Performance for Hospital/Medical/Infectious Waste Incinerators for Which Construction is Commenced After June 20, 1996 (September 15, 1997, 60 FR 48348).
- (g) This standard is not applicable to combustors which burn hospital waste and do not burn any medical/infectious waste and are subject to all provisions of 40 CFR 60 Subpart Eb, Standards of Performance for Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994, or for Which Modification or Reconstruction is Commenced After June 19, 1996; Subpart Cb, Emission Guidelines and Compliance Times for Large Municipal Waste Combustors that are Constructed on or Before September 20, 1994; or Subpart Ea, Standards of Performance for Municipal Waste Combustors for Which Construction is Commenced After December 20, 1989, and on or Before September 20, 1994.

## **Section II - Definitions.**

Unless stated otherwise, the definitions that appear in this section shall apply only to this standard.

- (a) Batch HMIWI - Means a HMIWI that is designed such that neither waste charging nor ash removal can occur during combustion.
- (b) Continuous HMIWI - Means a HMIWI that is designed to allow waste charging and ash removal during combustion.
- (c) Dry Scrubber - Means an add-on air pollution control system that injects dry alkaline sorbent (dry injection) or sprays an alkaline sorbent (spray dryer) to react with and neutralize acid gases in the HMIWI exhaust stream forming a dry powder material.

(d) Fabric Filter or Baghouse - Means an add-on air pollution control system that removes particulate matter and nonvaporous metals emissions by passing flue gas through filter bags.

(e) Facilities Manager - Means the individual in charge of purchasing, maintaining, and operating the HMIWI or the owner's or operator's representative responsible for the management of the HMIWI. Alternative titles may include director of facilities or vice president of support services.

(f) High-Air Phase - Means the stage of the batch operating cycle when the primary chamber reaches and maintains maximum operating temperatures.

(g) Hospital/Medical/Infectious Waste Incinerator Operator or HMIWI Operator - Means any person who operates, controls, or supervises the day-to-day operation of a HMIWI.

(h) Infectious Agent - Means any organism (such as a virus, bacteria or prion) that is capable of being communicated by invasion and multiplication in body tissues and capable of causing disease or adverse health impacts in humans.

(i) Intermittent HMIWI - Means a HMIWI that is designed to allow waste charging, but not ash removal, during combustion.

(j) Large HMIWI - Means:

(1) Except as provided in paragraph (j)(2) below,

(i) A HMIWI whose maximum design waste burning capacity is more than 500 pounds per hour (lbs/hr); or

(ii) A continuous or intermittent HMIWI whose maximum charge rate is more than 500 lbs/hr; or

(iii) A batch HMIWI whose maximum charge rate is more than 4,000 pounds per day (lbs/day).

(2) The following are not large HMIWI:

(i) A continuous or intermittent HMIWI whose maximum charge rate is less than or equal to 500 lbs/hr; or

(ii) A batch HMIWI whose maximum charge rate is less than or equal to 4,000 lbs/day.

(k) Maximum Charge Rate - Means:

(1) For continuous and intermittent HMIWI, 110 percent of the lowest three-hour average charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits.

(2) For batch HMIWI, 110 percent of the lowest daily charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits.

(l) Maximum Design Waste Burning Capacity - Means:

- (1) For intermittent and continuous HMIWI,

$$C = PV \times 15,000/8,500$$

where:

C = HMIWI capacity, lb/hr

PV = Primary chamber volume, cubic foot (ft<sup>3</sup>)

15,000 = Primary chamber heat release rate factor, British thermal unit per cubic foot per hour (Btu/ft<sup>3</sup>/hr)

8,500 = Standard waste heating value, Btu/lb;

- (2) For batch HMIWI,

$$C = PV \times 4.5/8$$

where:

C = HMIWI capacity, lb/hr

PV = Primary chamber volume, ft<sup>3</sup>

4.5 = Waste density, lb/ft<sup>3</sup>

8 = Typical hours of operation of a batch HMIWI, hours.

(m) Maximum Fabric Filter Inlet Temperature - Means 110 percent of the lowest three-hour average temperature at the inlet to the fabric filter (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the dioxins/furans emission limit.

(n) Maximum Flue Gas Temperature - Means 110 percent of the lowest three-hour average temperature at the outlet from the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the mercury (Hg) emission limit.

(o) Medium HMIWI - Means:

- (1) Except as provided in paragraph (o)(2) below;

(i) A HMIWI whose maximum design waste burning capacity is more than 200 lbs/hr but less than or equal to 500 lbs/hr; or

(ii) A continuous or intermittent HMIWI whose maximum charge rate is more than 200 lbs/hr but less than or equal to 500 lbs/hr; or

(iii) A batch HMIWI whose maximum charge rate is more than 1,600 lbs/day but less than or equal to 4,000 lbs/day.

- (2) The following are not medium HMIWI:

(i) A continuous or intermittent HMIWI whose maximum charge rate is less than or equal to 200 lbs/hr or more than 500 lbs/hr; or

(ii) A batch HMIWI whose maximum charge rate is more than 4,000 lbs/day or less than or equal to 1,600 lbs/day.

(p) Minimum Dioxins/Furans Sorbent Flow Rate - Means 90 percent of the highest three-hour average dioxins/furans sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the dioxins/furans emission limit.

(q) Minimum Mercury (Hg) Sorbent Flow Rate - Means 90 percent of the highest three-hour average Hg sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the Hg emission limit.

(r) Minimum Hydrogen Chloride (HCl) Sorbent Flow Rate - Means 90 percent of the highest three-hour average HCl sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the HCl emission limit.

(s) Minimum Horsepower or Amperage - Means 90 percent of the highest three-hour average horsepower or amperage to the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the applicable emission limits.

(t) Minimum Pressure Drop Across the Wet Scrubber - Means 90 percent of the highest three-hour average pressure drop across the wet scrubber PM control device (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the PM emission limit.

(u) Minimum Scrubber Liquor Flow Rate - Means 90 percent of the highest three-hour average liquor flow rate at the inlet to the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with all applicable emission limits.

(v) Minimum Scrubber Liquor pH - Means 90 percent of the highest three-hour average liquor pH at the inlet to the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the HCl emission limit.

(w) Minimum Secondary Chamber Temperature - Means 90 percent of the highest three-hour average secondary chamber temperature (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the PM, carbon monoxide (CO), or dioxins/furans emission limits.

(x) Modification or Modified HMIWI - Means any change to a HMIWI unit after the effective date of these standards such that:

(1) The cumulative costs of the modifications, over the life of the unit, exceed 50 percent of the original cost of the construction and installation of the unit (not including the cost of any land purchased in connection with such construction or installation) updated to current costs; or

(2) The change involves a physical change in or change in the method of operation of the unit which increases the amount of any air pollutant emitted by the unit for which standards have been established under Section 129 or Section 111 of the Clean Air Act (Act).

(y) Operating Day - Means a 24-hour period between 12:00 midnight and the following midnight during which any amount of hospital waste or medical/infectious waste is combusted at any time in the HMIWI.

(z) Operation - Means the period during which waste is combusted in the incinerator excluding periods of startup or shutdown.

(aa) Particulate Matter or PM - Means the total particulate matter emitted from a HMIWI as measured by Environmental Protection Agency (EPA) Reference Method 5 or EPA Reference Method 29.

(bb) Primary Chamber - Means the chamber in a HMIWI that receives waste material, in which the waste is ignited, and from which ash is removed.

(cc) Prion - Means a small infectious pathogen containing protein which is resistant to procedures that modify or hydrolyze nucleic acids.

(dd) Secondary Chamber - Means a component of the HMIWI that receives combustion gases from the primary chamber and in which the combustion process is completed.

(ee) Shutdown - Means the period of time after all waste has been combusted in the primary chamber. For continuous HMIWI, shutdown shall commence no less than two hours after the last charge to the incinerator. For intermittent HMIWI, shutdown shall commence no less than four hours after the last charge to the incinerator. For batch HMIWI, shutdown shall commence no less than five hours after the high-air phase of combustion has been completed.

(ff) Small HMIWI - Means:

(1) Except as provided in paragraph (ff)(2) below,

(i) An HMIWI whose maximum design waste burning capacity is less than or equal to 200 lbs/hr; or

(ii) A continuous or intermittent HMIWI whose maximum charge rate is less than or equal to 200 lbs/hr; or

(iii) A batch HMIWI whose maximum charge rate is less than or equal to 1,600 lbs/day.

(2) The following are not small HMIWI:

(i) A continuous or intermittent HMIWI whose maximum charge rate is more than 200 lbs/hr;

(ii) A batch HMIWI whose maximum charge rate is more than 1,600 lbs/day.

(gg) Standard Conditions - Means a temperature of 20 degrees Celsius (C) and a pressure of 101.3 kilopascals.

(hh) Startup - Means the period of time between the activation of the system and the first charge to the unit. For batch HMIWI, startup is the period of time between activation of the system and ignition of the waste.

(ii) Wet Scrubber - Means an add-on air pollution control device that utilizes an alkaline scrubbing liquor to collect PM (including nonvaporous metals and condensed organics) and/or to absorb and neutralize acid gases.

**Section III - Emission Limitations.**

(a) On and after the date on which the initial performance test is completed or is required to be completed as per Section VII of this standard, whichever date comes first, no owner or operator of an affected facility shall cause to be discharged into the atmosphere from that affected facility any gases that contain stack emissions in excess of the limits presented in Table I below.

Table I

Emission Limitations for Small, Medium, and Large Hospital/Medical/Infectious Waste Incinerators

Pollutant	Units (7 percent oxygen (O <sub>2</sub> ) basis, dry basis)	Small	Medium	Large
PM	Milligrams per dry standard cubic meter (gr/dscf)	115 (0.05)	69 (0.03)	34 (0.015)
CO	ppmv	40	40	40
Dioxins/Furans	Nanograms per dry standard cubic meter total dioxins/furans (grains per billion dry standard cubic feet) or nanograms per dry standard cubic meter TEQ (grains per billion dry standard cubic feet)	125 (55) or 2.3 (1.0)	125 (55) or 2.3 (1.0)	125 (55) or 2.3 (1.0)
HCl	ppmv or percent reduction	100 or 93 percent	100 or 93 percent	100 or 93 percent
Sulfur Dioxide (SO <sub>2</sub> )	ppmv	55	55	55
Nitrogen Oxide (NO <sub>x</sub> )	ppmv	250	250	250
Lead (Pb)	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	1.2 (0.52) or 70 percent	1.2 (0.52) or 70 percent	1.2 (0.52) or 70 percent
Cadmium (Cd)	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	0.16 (0.07) or 65 percent	0.16 (0.07) or 65 percent	0.16 (0.07) or 65 percent
Hg	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	0.55 (0.24) or 85 percent	0.55 (0.24) or 85 percent	0.55 (0.24) or 85 percent

gr/dscf = grains per dry standard cubic foot

ppmv = parts per million by volume

TEQ = Toxic Equivalents Quantity

(b) No owner or operator of an affected facility shall cause to be discharged into the atmosphere from



the stack of that affected facility any gases that exhibit greater than 10 percent opacity (six-minute rolling average) or equal to or greater than 30 percent at any time.

(c) No small HMIWI which is located more than 50 miles from the boundary of the nearest Standard Metropolitan Statistical Area (defined in 40 CFR 60.31e, September 15, 1997, 60 FR 48348), and which burns less than 2,000 pounds per week of hospital waste and medical/infectious waste shall cause to be discharged into the atmosphere from that affected facility any gases that contain stack emissions in excess of the limits presented in Table II below. The 2,000 lbs/week limitation does not apply during performance tests.

Table II  
Emission Limitations for Small Rural  
Hospital/Medical/Infectious Waste Incinerators

Pollutant	Units (7 percent O <sub>2</sub> basis, dry basis)	Small (Rural)
PM	Milligrams per dry standard cubic meter (gr/dscf)	197 (0.086)
CO	Ppmv	40
Dioxins/Furans	Nanograms per dry standard cubic meter total dioxins/furans (grains per billion dry standard cubic feet) or nanograms per dry standard cubic meter TEQ (grains per billion dry standard cubic feet)	800 (350) or 15 (6.6)
HCl	Ppmv	3100
SO <sub>2</sub>	Ppmv	55
NO <sub>x</sub>	Ppmv	250
Pb	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	10 (4.4)
Cd	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	4 (1.7)
Hg	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	7.5 (3.3)
Opacity	6 minute average	10 percent

gr/dscf = grains per dry standard cubic foot

ppmv = parts per million by volume

TEQ = Toxic Equivalents Quantity

(d) Large HMIWI with capacity greater than 2,000 lbs/hr for continuous and 16,000 lbs/day for batch shall complete an ambient impact analysis for: arsenic and compounds expressed as arsenic; beryllium and compounds expressed as beryllium; hexavalent chromium and compounds expressed as chromium; and nickel and compounds expressed as nickel.

(1) Using available emission factors, the emissions from the facility shall be estimated and the analysis shall be conducted by performing dispersion modeling using the facility's exhaust characteristics. The analysis shall be conducted in accordance with the procedures stipulated in the Air Quality Modeling

Guidelines.

(2) The required analysis must show that predicted concentrations do not exceed the following applicable annual ambient concentrations.

Table III  
Allowable Ambient Concentrations

Pollutant	Units	Allowable Ambient Concentration
Arsenic (As)	µg/m <sup>3</sup>	2.3e-04
Beryllium (Be)	µg/m <sup>3</sup>	4.2e-04
Hexavalent Chromium (Cr (+6))	µg/m <sup>3</sup>	8.3e-05
Nickel (Ni)	µg/m <sup>3</sup>	3.3e-03

µg/m<sup>3</sup> = micrograms per cubic meter

(3) Compliance shall be verified by stack sampling as described in Section VII of this standard. Using the actual stack parameters and emission rates from the most recent source test and Department approved modeling techniques, the calculated maximum annual ambient concentrations shall not exceed the above levels. The modeling methodology shall be submitted with the source test plans required by Regulation 61-62.1, Section IV, Source Tests. The applicant shall submit a Modeling Protocol to the Department and receive approval prior to starting any modeling study.

(e) Large HMIWI with capacity greater than 2,000 lbs/hr for continuous and 16,000 lbs/day for batch shall maintain a combustion efficiency of 99.9 percent or greater on an hourly basis. The combustion efficiency shall be calculated as follows:

$$C.E. = \frac{[CO_2]}{[CO_2]+[CO]} \times 100$$

C.E. = Combustion efficiency

[CO<sub>2</sub>] = Concentration of carbon dioxide (ppmv corrected to 7 percent O<sub>2</sub>)

[CO] = Concentration of carbon monoxide (ppmv corrected to 7 percent O<sub>2</sub>)

Note: O<sub>2</sub>, CO<sub>2</sub>, and CO determined on a dry basis.

(f) Upon mutual agreement of an owner or operator of a HMIWI and the Department, an emission limit more restrictive than that otherwise specified in this standard and/or an emission limit for any air contaminant discharged from the HMIWI that is not specified in this standard may be established. Also, upon mutual agreement of the owner or operator of an affected source and the Department, operating hours, process flow rates, or any other operating parameter may be established as a binding limit for the affected source. Any items mutually agreed to shall be stated as a special condition for any permit or order concerning the source. Violation of this mutual agreement will be considered a violation and will be subject to appropriate enforcement.

#### **Section IV - Performance Specifications.**

(a) The owner or operator of an affected facility shall ensure that:

(1) The secondary chamber is maintained at a temperature equal to or greater than 1800 degrees Fahrenheit (F). A thermocouple is appropriately located at the exit of the chamber to confirm the temperature.

(2) The temperature equal to or greater than 1800 degrees F is maintained for at least one second (secondary chamber residence time). The ducting between the secondary chamber and heat recovery system or the breaching and portion of the stack (tertiary chamber) may not be included for the residence time demonstration.

(3) The auxiliary (secondary and/or tertiary) burners of the incinerator are designed such that without the assistance of the heat content of the waste, a minimum temperature of 2000 degrees F can be maintained for at least one second. (See Appendix B)

(4) Appendix B of this standard shall be used to demonstrate compliance with paragraphs (a)(2) and (3) above.

(b) Owners or operators which have an incinerator facility with a continuous capacity greater than 2000 lbs/hr or a batch capacity of less than 16,000 lbs/day in existence on or before May 25, 1990, equipped with a secondary chamber and/or an afterburner operated at a minimum temperature equal to or greater than 1800 degrees F may choose to meet a more restrictive visible emission standard of zero percent opacity in lieu of meeting the residence time requirements in paragraph (a) above. However, a residence time of at least 0.5 seconds will be required if the facility is permitted to burn hazardous waste or antineoplastic drugs.

(c) The firing of the burners and the combustion air shall be modulated automatically to maintain a secondary chamber exit or after burner temperature of at least 1800 degrees F.

(d) The incinerator shall be equipped with an automatic loader except for units with capacities less than or equal to 300 lbs/hr and equipped with the interlocks specified in paragraphs (e) or (g) below or as provided in paragraph (f) below. However, a sealed feeding device capable of preventing combustion upsets during charging will be required for the units with capacity less than 300 lbs/hr.

(e) For batch fed incinerators (fully loaded while cold and never opened until burn cycle is completed), interlocks should be provided to prevent (1) ignition of the waste until the secondary chamber exit or afterburner temperature is established at equal to or greater than 1800 degrees F; and (2) recharging until the combustion cycle is complete. No waste shall be incinerated if the required interlock system is not operational.

(f) The owner or operator of an incinerator, except a batch incinerator in existence on or before May 25, 1990, which is manually fed may submit a written request to the Department that manual feeding be allowed. The request must include a plan detailing the methods and operating procedure to be employed in manually charging the incinerator. The Department shall determine if the plan provided is acceptable.

(1) The owner or operator of the incinerator must post or file on the operating premises a copy of the approved plan.

(2) The plan shall not relieve the owner or operator of the duty of meeting all other emission requirements.

(3) Any violation of the conditions under which the plan was approved or any violation of other requirements of this standard may result in the Department requiring that an automatic mechanical loading device be installed.

(g) For non-batch fed incinerators, the charging of waste to the incinerator shall automatically cease through the use of an interlock system when any of the following conditions exist: [Note: The only monitors required in the interlock system are those required for a specific incinerator size facility in Section V below.]

(1) The incinerator's secondary chamber exit or afterburner temperature drops below 1800 degrees F; and/or

(2) The carbon monoxide emissions are equal to or greater than 150 ppmv (dry basis), corrected to seven percent O<sub>2</sub> on a dry basis for a 15 minute period; and/or

(3) The flue gas O<sub>2</sub> level drops below six percent (dry basis) for a 15 minute period; and/or

(4) The opacity of the visible emissions is equal to or greater than 10 percent for a period of 15 minutes; and/or

(5) The required monitoring equipment is not functioning.

(h) Startup and Shutdown Requirements

(1) The owner or operator of an affected facility shall ensure that:

(i) No waste is charged to an incinerator other than a batch incinerator until the secondary chamber or afterburner has achieved a minimum temperature of 1800 degrees F.

(ii) The secondary chamber or afterburner has achieved and maintained the required minimum temperature for 15 minutes before charging begins.

(iii) The control equipment (if equipped) is operational and functioning properly, prior to the ignition of waste and until all the waste is incinerated.

(2) The owner or operator of an affected facility shall ensure that during shutdowns the secondary chamber or afterburner minimum temperature of 1800 degrees F is to be maintained using auxiliary burners until "shutdown" as defined in Section II of this standard has been met.

(3) The owner or operator of an affected facility shall ensure that a detailed procedure for normal system startup and shutdown, including the duration of preheat and burnout cycles, is submitted as part of the application for approval.

(i) Storage.

(1) The owner or operator of an affected facility shall ensure that the storage of hospital/medical/infectious waste shall be in a manner approved by the Department to prevent the escape of malodor.

(2) The owner or operator of an affected facility shall ensure that hospital/medical/infectious waste and ash are stored only in enclosed, leaktight containers or areas.

(3) The owner or operator of an affected facility shall ensure that ash is loaded in an enclosed area or handled wet in enclosed containers.

## **Section V - Monitoring Requirements.**

### **(a) General.**

(1) The owner or operator of an affected facility shall ensure that all monitoring devices are maintained in accordance with Section VI of this standard.

(2) The owner or operator of an affected facility shall ensure that all data recorder resolutions are sufficient to display the data recording frequencies required in Table IV, and Section V(d) of this standard.

### **(b) Small (Rural) HMIWI facilities.**

(1) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a device for measuring and recording the temperature of the secondary chamber on a continuous basis, the output of which shall be recorded, at a minimum, once every minute throughout operation.

(2) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a device which automatically measures and records the date, time, and weight of each charge fed into the HMIWI.

(3) The owner or operator of an affected facility shall obtain monitoring data at all times during HMIWI operation except during periods of monitoring equipment malfunction, calibration, or repair. At a minimum, valid monitoring data shall be obtained for 75 percent of the operating hours per day and for 90 percent of the operating hours per calendar quarter that the affected facility is combusting hospital waste and/or medical/infectious waste.

### **(c) Small (Urban), Medium, and Large HMIWI facilities**

(1) The owner or operator of an affected facility shall install, calibrate, maintain, and operate devices (or establish methods) for monitoring the applicable maximum and minimum operating parameters listed in Table IV of this standard such that these devices (or methods) measure and record values for these operating parameters at the frequencies indicated in Table IV of this standard at all times except during periods of startup and shutdown.

(2) The owner or operator of an affected facility shall install, calibrate, maintain, and operate a device or method for measuring the use of the bypass stack including date, time, and duration.

(3) The owner or operator of an affected facility using something other than a dry scrubber followed by a fabric filter, a wet scrubber, or a dry scrubber followed by a fabric filter and a wet scrubber to comply with the emission limits under this standard shall install, calibrate, maintain, and operate the equipment necessary to monitor the site-specific operating parameters developed pursuant to Section VII (c)(8) of this standard.

(4) The owner or operator of an affected facility shall obtain monitoring data at all times during HMIWI operation except during periods of monitoring equipment malfunction, calibration, or repair. At a minimum, valid monitoring data shall be obtained for 75 percent of the operating hours per day and for 90 percent of the operating days per calendar quarter that the affected facility is combusting hospital waste and/or medical/infectious waste.

(5) The owner or operator of an affected facility shall ensure that:

(i) The secondary chamber or afterburner temperatures are continuously monitored and recorded.

(ii) Sensors are installed, maintained, and operated such that the flames from the burners do not impinge upon the sensors.

(iii) The secondary chamber temperature is measured at or beyond the chamber exit.

(6) The Department reserves the right to require the owner/operator to provide telemetering of continuous monitoring data to the Department.

(d) Large HMIWI facilities with capacity equal to or greater than 2,000 lbs/hr

The owner or operator of an affected facility shall ensure that:

(1) Continuous monitors are installed on each HMIWI emission stack for O<sub>2</sub>, CO, CO<sub>2</sub>, and opacity.

(2) The O<sub>2</sub>, CO, and CO<sub>2</sub> monitors are co-located upstream of any air pollution control devices unless otherwise approved by the Department.

(3) Each O<sub>2</sub> monitor takes at a minimum of one measurement every 60 seconds and that this data is recorded at least every successive five minutes.

(4) Each CO monitor takes a minimum of one measurement every 60 seconds and that this data recorded at least every successive five minutes.

(5) Each CO<sub>2</sub> monitor takes a minimum of one measurement every 60 seconds and that this data recorded at least every successive five minutes.

(6) Each opacity monitor completes a minimum of one cycle of sampling and analysis for each 10 second period and one cycle of data recording for each successive six-minute period.

Table IV

Operating Parameters to be Monitored and Minimum Measurement and Recording Frequencies

Operating parameters to be monitored	Minimum frequency		Control system		
	Data measurement	Data recording	Dry scrubber followed by fabric filter	Wet scrubber	Dry scrubber followed by fabric filter and wet scrubber
Maximum operating parameters:					

Operating parameters to be monitored	Minimum frequency		Control system		
	Data measurement	Data recording	Dry scrubber followed by fabric filter	Wet scrubber	Dry scrubber followed by fabric filter and wet scrubber
Max. charge rate	Continuous	1 time/hour	X	X	X
Max. fabric filter inlet temperature	Continuous	1 time/minute	X	.....	X
Max. flue gas temperature	Continuous	1 time/minute	X	X	X
Minimum operating parameters:					
Min. secondary chamber temperature	Continuous	1 time/minute	X	X	X
Min. dioxins/furans sorbent flow rate	Hourly	1 time/hour	X	.....	X
Min. HCl sorbent flow rate	Hourly	1 time/hour	X	.....	X
Min. mercury (Hg) sorbent flow rate	Hourly	1 time/hour	X	.....	X
Min. pressure drop across the wet scrubber or min. horsepower or amperage to wet scrubber	Continuous	1 time/minute	.....	X	X
Min. scrubber liquor flow rate	Continuous	1 time/minute	.....	X	X
Min. scrubber liquor pH	Continuous	1 time/minute	.....	X	X

**Section VI - Calibration and Quality Assurance of Monitoring Devices.**

(a) Provisions of this section, or other procedures approved by the Department, are applicable to monitoring devices which are required under Section V of this standard or which are required by permit conditions to establish compliance with Regulation 61-62.5, Standard No. 3.1. The daily zero and span calibration for all categories of continuous emission monitors shall comply with the requirements of 40 CFR 60.13(d)(1) and (d)(2), July 1, 1988.

(b) The owner or operator of an affected facility shall ensure that any monitoring devices required by this standard, but not included in this section, conform to the manufacturers specifications for initial calibration and quality assurance unless otherwise stated in regulation or permit requirements. Likewise, those monitors specifically mentioned may be subject to other, more stringent, regulatory and permit requirements.

(c) The owner or operator of an affected facility shall ensure that CO, CO<sub>2</sub>, O<sub>2</sub>, and opacity monitors are

recalibrated annually in accordance with paragraph (b) above. Opacity monitors must be audited with low, medium, and high neutral density filters that are National Institute of Science and Technology (NIST) traceable.

## **Section VII - Testing Requirements.**

### **(a) General**

(1) The owner or operator of an affected HMIWI facility constructed on or before June 20, 1996, shall ensure that an initial source test is conducted no later than 12 months following the effective date of this standard.

(2) For incinerator facilities where construction commenced after June 20, 1996, or modification began after March 16, 1998, the owner or operator shall ensure that an initial source test is conducted within 60 days after achieving the maximum production rate at which the incinerator will be operated, but no later than 180 days after initial startup.

(3) The owner or operator of an affected facility shall ensure that source testing is conducted in the manner prescribed in Section 60.37e of Subpart Ce (40 CFR 60) and in accordance with Regulation 61-62.1 Section IV, Source Tests. The use of the bypass stack during a performance test shall invalidate the performance test.

(4) The Department may require air contaminant source testing as determined to be necessary to assure continuous compliance with the requirements of this standard and any emission limit stipulated as a permit condition.

(5) The emission limits under this standard apply at all times except during periods of startup, shutdown, or malfunction, provided that no hospital waste or medical/infectious waste is charged to the affected facility during startup, shutdown, or malfunction.

### **(b) Existing Sources**

#### **(1) Small (Rural) HMIWI facilities.**

(i) The owner or operator of an affected facility shall ensure that an initial source test is conducted for the following:

(A) Particulate matter;

(B) CO;

(C) Hg;

(D) Dioxins/furans; and

(E) Opacity.

(ii) The Department reserves the right to require the owner or operator to conduct further source tests at any time if it is determined to be necessary by the Department after the initial compliance test. In addition to paragraph (b)(1)(i) above, these tests may include:



- (A) HCl;
- (B) Arsenic and compounds expressed as arsenic;
- (C) Beryllium and compounds expressed as beryllium;
- (D) Cadmium and compounds expressed as cadmium;
- (E) Hexavalent chromium and compounds expressed as chromium;
- (F) Lead and compounds expressed as lead; and
- (G) Nickel and compounds expressed as nickel.

(iii) The owner or operator of an affected facility shall establish maximum charge rate and minimum secondary chamber temperature as site-specific operating parameters during the initial performance test to determine compliance with applicable emission limits.

(iv) Following the date on which the initial performance test is completed or is required to be completed under this standard, whichever date comes first, the owner or operator of an affected facility shall ensure that the designated facility does not operate above the maximum charge rate or below the minimum secondary chamber temperature measured as three-hour rolling averages (calculated each hour as the average of the previous three operating hours) at all times except during periods of startup, shutdown and malfunction. Operating parameter limits do not apply during performance tests. Operation above the maximum charge rate or below the minimum secondary chamber temperature shall constitute a violation of the established operating parameter(s).

(v) Except as provided in paragraph (b)(1)(vi) below, operation of the designated facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the PM, CO, and dioxins/furans emission limits.

(vi) The owner or operator of an affected facility may conduct a repeat performance test within 30 days of violation of applicable operating parameter(s) to demonstrate that the designated facility is not in violation of the applicable emission limit(s). The owner or operator of an affected facility shall ensure that repeat performance tests are conducted pursuant to this paragraph using the identical operating parameters that indicated a violation under paragraph (b)(1)(v) above.

(vii) The owner or operator of an affected facility shall demonstrate compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods.

## (2) Small (Urban) HMIWI facilities

(i) The owner or operator of an affected facility shall ensure that an initial source test is conducted for the following:

- (A) Particulate matter;
- (B) HCl;

- (C) CO;
- (D) Cadmium;
- (E) Lead;
- (F) Hg;
- (G) Dioxins/furans; and
- (H) Opacity.

(ii) The Department reserves the right to require the owner or operator to conduct further source tests at any time if it is determined to be necessary by the Department after the initial compliance test. In addition to paragraph (b)(2)(i) above, these tests may include:

- (A) Arsenic and compounds expressed as arsenic;
- (B) Beryllium and compounds expressed as beryllium;
- (C) Hexavalent chromium and compounds expressed as chromium; and
- (D) Nickel and compounds expressed as nickel.

(iii) Following the date on which the initial performance test is completed or is required to be completed, whichever date comes first, the owner or operator of an affected facility shall:

(A) Demonstrate compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods.

(B) Demonstrate compliance with the PM, CO, and HCl emission limits by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods in accordance with paragraph (a)(3) of this section. If all three performance tests over a three-year period indicate compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for the subsequent two years. At a minimum, a performance test for PM, CO, and HCl shall be conducted every third year (no more than 36 months following the previous performance test). If a performance test conducted every third year indicates compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for an additional two years. If any performance test indicates noncompliance with the respective emission limit, a performance test for that pollutant shall be conducted annually until all annual performance tests over a three-year period indicate compliance with the emission limit. The use of the bypass stack during a performance test shall invalidate the performance test.

### (3) Medium HMIWI facilities

(i) The owner or operator of an affected facility shall ensure that an initial source test is conducted for the following:

- (A) Particulate matter;

- (B) HCl;
- (C) CO;
- (D) Cadmium;
- (E) Lead;
- (F) Hg;
- (G) Dioxins/furans; and
- (H) Opacity.

(ii) The Department reserves the right to require the owner or operator to conduct further source tests at any time if it is determined to be necessary by the Department after the initial compliance test. In addition to paragraph (b)(3)(i) above, these tests may include:

- (A) Arsenic and compounds expressed as arsenic;
- (B) Beryllium and compounds expressed as beryllium;
- (C) Hexavalent chromium and compounds expressed as chromium; and
- (D) Nickel and compounds expressed as nickel.

(iii) Following the date on which the initial performance test is completed or is required to be completed, whichever date comes first, the owner or operator of an affected facility shall:

(A) Demonstrate compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods.

(B) Demonstrate compliance with the PM, CO, and HCl emission limits by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods in accordance with paragraph (a)(3) of this section. If all three performance tests over a three-year period indicate compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for the subsequent two years. At a minimum, a performance test for PM, CO, and HCl shall be conducted every third year (no more than 36 months following the previous performance test). If a performance test conducted every third year indicates compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for an additional two years. If any performance test indicates noncompliance with the respective emission limit, a performance test for that pollutant shall be conducted annually until all annual performance tests over a three-year period indicate compliance with the emission limit. The use of the bypass stack during a performance test shall invalidate the performance test.

(4) Large HMIWI facilities with capacity < 2000 lbs/hr

(i) The owner or operator of an affected facility shall ensure that an initial source test is conducted for the following:

- (A) Particulate matter;
- (B) HCl;
- (C) CO;
- (D) Cadmium;
- (E) Lead;
- (F) Hg;
- (G) Dioxins/furans; and
- (H) Opacity.

(ii) The Department reserves the right to require the owner or operator to conduct further source tests at any time if it is determined to be necessary by the Department after the initial compliance test. In addition to paragraph (b)(4)(i) above, these tests may include:

- (A) Arsenic and compounds expressed as arsenic;
- (B) Beryllium and compounds expressed as beryllium;
- (C) Hexavalent chromium and compounds expressed as chromium; and
- (D) Nickel and compounds expressed as nickel.

(iii) Following the date on which the initial performance test is completed or is required to be completed, whichever date comes first, the owner or operator of an affected facility shall:

(A) Demonstrate compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods.

(B) Demonstrate compliance with the PM, CO, and HCl emission limits by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods in accordance with paragraph (a)(3) of this section. If all three performance tests over a three-year period indicate compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for the subsequent two years. At a minimum, a performance test for PM, CO, and HCl shall be conducted every third year (no more than 36 months following the previous performance test). If a performance test conducted every third year indicates compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for an additional two years. If any performance test indicates noncompliance with the respective emission limit, a performance test for that pollutant shall be conducted annually until all annual performance tests over a three-year period indicate compliance with the emission limit. The use of the bypass stack during a performance test shall invalidate the performance test.

(5) Large HMIWI facilities with capacity equal to or greater than 2000 lbs/hr

(i) The owner or operator of an affected facility shall ensure that an initial source test is conducted

for the following:

- (A) Particulate matter;
- (B) HCl;
- (C) CO;
- (D) Cadmium;
- (E) Lead;
- (F) Hg;
- (G) Dioxins/furans; and
- (H) Opacity.

(ii) The Department reserves the right to require the owner or operator to conduct further source tests at any time if it is determined to be necessary by the Department after the initial compliance test. In addition to paragraph (b)(5)(i) above, these tests may include:

- (A) Arsenic and compounds expressed as arsenic;
- (B) Beryllium and compounds expressed as beryllium;
- (C) Hexavalent chromium and compounds expressed as chromium;
- (D) Nickel and compounds expressed as nickel; and
- (E) SO<sub>2</sub>.

(iii) Following the date on which the initial performance test is completed or is required to be completed, whichever date comes first, the owner or operator of an affected facility shall:

(A) Demonstrate compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods.

(B) Demonstrate compliance with the PM, CO, HCl, and dioxins/furans emission limits by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods in accordance with paragraph (a)(3) of this section. If all four performance tests over a three-year period indicate compliance with the emission limit for a pollutant (PM, CO, HCl, or dioxins/furans), the owner or operator may forego a performance test for that pollutant for the subsequent two years. At a minimum, a performance test for PM, CO, HCl, and dioxins/furans shall be conducted every third year (no more than 36 months following the previous performance test). If a performance test conducted every third year indicates compliance with the emission limit for a pollutant (PM, CO, HCl, or dioxins/furans), the owner or operator may forego a performance test for that pollutant for an additional two years. If any performance test indicates noncompliance with the respective emission limit, a performance test for that pollutant shall be conducted annually until all annual performance tests over a three-year period indicate compliance with the emission limit. The use of the bypass stack during a

performance test shall invalidate the performance test.

(c) Additional Testing Requirements for New, Existing, and Modified Sources

(1) An owner or operator of a facility using a Continuous Emission Monitoring System (CEMS) to demonstrate compliance with any of the emission limits under Section III of this standard shall:

(i) Determine compliance with the appropriate emission limit(s) using a 12-hour rolling average, calculated each hour as the average of the previous 12 operating hours (not including startup, shutdown, or malfunction).

(ii) Operate all CEMS in accordance with the applicable procedures under Section V of this standard and 40 CFR 60, Appendices B and F.

(2) The owner of an affected facility shall demonstrate to the Department and maintain a combustible carbon content not to exceed six percent (dry basis) in the ash residue (ash and non-combustibles). Such a demonstration shall use the test method outlined in ASTM Method D 3178 “Carbon & Hydrogen Analysis of Coal and Coke,” ASTM Method D 5373, or other methods approved by this Department and be performed at least once per year. The Department reserves the right to require more frequent demonstrations when it is determined to be necessary. The Department also reserves the right to alter the frequency of the required demonstrations as a data base is established and the ash quality consistently shows compliance for a specific facility.

(3) The owner or operator of an affected facility equipped with a dry scrubber followed by a fabric filter, a wet scrubber, or a dry scrubber followed by a fabric filter and wet scrubber shall:

(i) Establish the appropriate maximum and minimum operating parameters, indicated in Table IV of this standard for each control system, as site specific operating parameters during the initial performance test to determine compliance with the emission limits; and

(ii) Following the date on which the initial performance test is completed or is required to be completed under this standard, whichever date comes first, the owner or operator shall ensure that the affected facility does not operate above any of the applicable maximum operating parameters or below any of the applicable minimum operating parameters listed in Table IV of this standard and measured as three-hour rolling averages (calculated each hour as the average of the previous three operating hours) at all times except during periods of startup, shutdown and malfunction. Operating parameter limits do not apply during performance tests. Operation above the established maximum or below the established minimum operating parameter(s) shall constitute a violation of established operating parameter(s).

(4) Except as provided in paragraph (c)(7) of this section, for affected facilities equipped with a dry scrubber followed by a fabric filter:

(i) Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.

(ii) Operation of the affected facility above the maximum fabric filter inlet temperature, above the maximum charge rate, and below the minimum dioxins/furans sorbent flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the dioxins/furans emission limit.

(iii) Operation of the affected facility above the maximum charge rate and below the minimum HCl

sorbent flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the HCl emission limit.

(iv) Operation of the affected facility above the maximum charge rate and below the minimum Hg sorbent flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the Hg emission limit.

(v) Use of the bypass stack (except during startup, shutdown, or malfunction) shall constitute a violation of the PM, dioxins/furans, HCl, Pb, Cd and Hg emission limits.

(5) Except as provided in paragraph (c)(7) of this section, for affected facilities equipped with a wet scrubber:

(i) Operation of the affected facility above the maximum charge rate and below the minimum pressure drop across the wet scrubber or below the minimum horsepower or amperage to the system (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the PM emission limit.

(ii) Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.

(iii) Operation of the affected facility above the maximum charge rate, below the minimum secondary chamber temperature, and below the minimum scrubber liquor flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the dioxins/furans emission limit.

(iv) Operation of the affected facility above the maximum charge rate and below the minimum scrubber liquor pH (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the HCl emission limit.

(v) Operation of the affected facility above the maximum flue gas temperature and above the maximum charge rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the Hg emission limit.

(vi) Use of the bypass stack (except during startup, shutdown, or malfunction) shall constitute a violation of the PM, dioxins/furans, HCl, Pb, Cd and Hg emission limits.

(6) Except as provided in paragraph (c)(7) of this section, for affected facilities equipped with a dry scrubber followed by a fabric filter and a wet scrubber:

(i) Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.

(ii) Operation of the affected facility above the maximum fabric filter inlet temperature, above the maximum charge rate, and below the minimum dioxins/furans sorbent flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the dioxins/furans emission limit.

(iii) Operation of the affected facility above the maximum charge rate and below the minimum scrubber liquor pH (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the HCl emission limit.

(iv) Operation of the affected facility above the maximum charge rate and below the minimum Hg sorbent flow rate (each measured on a three-hour rolling average) simultaneously shall constitute a violation of the Hg emission limit.

(v) Use of the bypass stack (except during startup, shutdown, or malfunction) shall constitute a violation of the PM, dioxins/furans, HCl, Pb, Cd and Hg emission limits.

(7) The owner or operator of an affected facility may conduct a repeat performance test within 30 days of violation of applicable operating parameter(s) to demonstrate that the affected facility is not in violation of the applicable emission limit(s). Repeat performance tests conducted pursuant to this paragraph shall be conducted using the identical operating parameters that indicated a violation under paragraph (c)(4), (c)(5), or (c)(6) of this section.

(8) The owner or operator of an affected facility using an air pollution control device other than a dry scrubber followed by a fabric filter, a wet scrubber, or a dry scrubber followed by a fabric filter and a wet scrubber to comply with the emission limits under this standard shall contact the EPA in writing for approval of other site-specific operating parameters to be established during the initial performance test and continuously monitored thereafter. The owner or operator shall not conduct the initial performance test until after the request has been approved by the EPA.

(9) The owner or operator of an affected facility may conduct a repeat performance test at any time, in accordance with the requirements of Regulation 61-62.1, Section IV, Source Test, to establish new values for the operating parameters. The Department may request a repeat performance test at any time.

### **Section VIII - Recordkeeping and Reporting Requirements.**

(a) The owner or operator of an affected facility shall ensure that:

(1) Inspection and maintenance schedules for incinerators are posted or kept on-site at or near the incinerator.

(2) Operating procedures, startup procedures, and shutdown procedures for incinerators are approved by the Department and posted on-site at or near the incinerator.

(b) In addition to an inspection and maintenance plan, the owner or operator shall prepare a plan of action for approval by the Department. The plan of action shall identify the steps and procedures the operator will follow to avoid exceedances of the emission limitations and operating conditions specified in this standard or specific permit conditions. The plan shall include descriptions of startup and shutdown procedures; actions to be taken to correct anomalous operating conditions and training of plant operators.

(c) The owner or operator of an affected facility shall maintain the following information (as applicable) for a period of at least five years:

(1) Calendar date of each record;

(2) Records of the following data:

(i) Concentrations of any pollutant listed in this standard or measurements of opacity as determined by the continuous emission monitoring system (if applicable);



- (ii) HMIWI charge dates, times, and weights and hourly charge rates;
- (iii) Fabric filter inlet temperatures during each minute of operation, as applicable;
- (iv) Amount and type of dioxins/furans sorbent used during each hour of operation, as applicable;
- (v) Amount and type of Hg sorbent used during each hour of operation, as applicable;
- (vi) Amount and type of HCl sorbent used during each hour of operation, as applicable;
- (vii) Secondary chamber temperatures recorded during each minute of operation;
- (viii) Liquor flow rate to the wet scrubber inlet during each minute of operation, as applicable;
- (ix) Horsepower or amperage to the wet scrubber during each minute of operation, as applicable;
- (x) Pressure drop across the wet scrubber system during each minute of operation, as applicable;
- (xi) Temperature at the outlet from the wet scrubber during each minute of operation, as applicable;
- (xii) pH at the inlet to the wet scrubber during each minute of operation, as applicable;
- (xiii) Records indicating use of the bypass stack, including dates, times, and durations; and

(xiv) For affected facilities complying with Section VII(c)(8) and Section V(c)(3) of this standard, the owner or operator shall maintain all operating parameter data collected.

(3) Identification of calendar days for which data on emission rates or operating parameters specified under paragraph (c)(2) of this section have not been obtained, with an identification of the emission rates or operating parameters not measured, reasons for not obtaining the data, and a description of corrective actions taken.

(4) Identification of calendar days, times and durations of malfunctions, a description of the malfunction and the corrective action taken.

(5) Identification of calendar days for which data on emission rates or operating parameters specified under paragraph (c)(2) of this section exceeded the applicable limits, with a description of the exceedances, reasons for such exceedances, and a description of corrective actions taken.

(6) The results of the initial, annual, and any subsequent performance tests conducted to determine compliance with the emission limits and/or to establish operating parameters, as applicable.

(7) Records showing the names of HMIWI operators who have completed review of the information in Section IX(h) as required by Section IX(g) of this standard, including the date of the initial review and all subsequent annual reviews.

(8) Records showing the names of the HMIWI operators who have completed the operator training requirements, including documentation of training and the dates of the training.

(9) Records showing the names of the HMIWI operators who have met the criteria for qualification under Section IX of this standard and the dates of their qualification.

(10) Records of calibration of any monitoring devices as required under Sections V(b), (c), and (d) of this standard.

(d) The owner or operator of an affected facility shall submit the information specified in paragraphs (d)(1) through (d)(3) of this section no later than 30 days following the initial performance test. All reports shall be signed by the facilities manager.

(1) The initial performance test data as recorded under Section VII of this standard, as applicable.

(2) The values for the site-specific operating parameters established pursuant to Section VII of this standard, as applicable.

(3) The waste management plan as specified in Section X of this standard.

(e) The owner or operator of an affected facility shall ensure that an annual report is submitted one year following the submission of the information in paragraph (d) of this section. Subsequent reports shall be submitted no more than 12 months following the previous report (once the unit is subject to permitting requirements under Title V of the Clean Air Act, the owner or operator of an affected facility must submit these reports semi-annually). The annual report shall include the information specified in paragraphs (e)(1) through (e)(8) of this section. All reports shall be signed by the facilities manager.

(1) The values for the site-specific operating parameters established pursuant to Section VII of this standard, as applicable.

(2) The highest maximum operating parameter and the lowest minimum operating parameter, as applicable, for each operating parameter recorded for the calendar year being reported, pursuant to Section VII of this standard, as applicable.

(3) The highest maximum operating parameter and the lowest minimum operating parameter, as applicable for each operating parameter recorded pursuant to Section VII of this standard for the calendar year preceding the year being reported, in order to provide the Department with a summary of the performance of the affected facility over a two-year period.

(4) Any information recorded under paragraphs (c)(3) through (c)(5) of this section for the calendar year being reported.

(5) Any information recorded under paragraphs (c)(3) through (c)(5) of this section for the calendar year preceding the year being reported, in order to provide the Department with a summary of the performance of the affected facility over a two-year period.

(6) If a performance test was conducted during the reporting period, the results of that test.

(7) If no exceedances or malfunctions were reported under paragraphs (c)(3) through (c)(5) of this section for the calendar year being reported, a statement that no exceedances occurred during the reporting period.

(8) Any use of the bypass stack, the duration, reason for malfunction, and corrective action taken.

(f) The owner or operator of an affected facility shall submit semi-annual reports containing any information recorded under paragraphs (c)(3) through (c)(5) of this section no later than 60 days following

the reporting period. The first semi-annual reporting period ends six months following the submission of information in paragraph (d) of this section. Subsequent reports shall be submitted no later than six-calendar months following the previous report. All reports shall be signed by the facilities manager.

(g) All records specified under paragraph (c) of this section shall be maintained on-site in either paper copy or computer-readable format, unless an alternative format is approved by the Department.

(h) The owner or operator of each small rural HMIWI subject to the emission limits in Table II of this standard shall:

(1) Maintain records of the annual equipment inspections, any required maintenance, and any repairs not completed within 10 days of an inspection or the time frame established by the Department; and

(2) Submit an annual report containing information recorded under paragraph (h)(1) of this section no later than 60 days following the year in which data were collected. Subsequent reports shall be sent no later than 12 calendar months following the previous report (once the unit is subject to permitting requirements under Title V of the Act, the owner or operator must submit these reports semi-annually). The report shall be signed by the facilities manager.

(i) The owner or operator of an affected facility shall ensure that copies of all records and reports required under this section are available for inspection during normal working hours and copies are furnished within 10-working days after receipt of a written request from the Department.

(j) The owner or operator of an affected facility subject to the monitoring provisions of this standard will be required to report quarterly all exceedances of limits specified in the source's operating permit. All quarterly reports must be postmarked by the 30th day following the end of each calendar quarter.

(k) The owner or operator of an affected facility shall ensure the appropriate Regional Environmental Quality Control Office is notified by telephone immediately following any failure of process equipment, failure of any air pollution control equipment, failure of any monitoring equipment, or a process operational error which results in an increase in emissions above any allowable emission rate. In addition, the owner or operator of an affected facility shall ensure that the Department is notified in writing of the problem and measures taken to correct the problem as expeditiously as possible in accordance with South Carolina Air Pollution Control Regulation 61-62.1, Section II.J.1.c.

### **Section IX - Operator Training and Qualification Requirements.**

(a) No owner or operator of an affected facility shall allow the affected facility to operate at any time unless a fully trained and qualified HMIWI operator is accessible, either at the facility or available within one hour. The trained and qualified HMIWI operator may operate the HMIWI directly or be the direct supervisor of one or more HMIWI operators.

(b) The owner or operator of an affected facility shall ensure that operator training and qualification is obtained through a program approved by the Department and which shall include the requirements contained in paragraphs (c) through (g) of this section.

(c) Training shall be obtained by completing an HMIWI operator training course that includes, at a minimum, the following provisions:

(1) 24 hours of training on the following subjects:

- (i) Environmental concerns, including pathogen destruction and types of emissions;
  - (ii) Basic combustion principles, including products of combustion;
  - (iii) Operation of the type of incinerator to be used by the operator, including proper startup, waste charging, and shutdown procedures;
  - (iv) Combustion controls and monitoring;
  - (v) Operation of air pollution control equipment and factors affecting performance (if applicable);
  - (vi) Methods to monitor pollutants (continuous emission monitoring systems and monitoring of HMIWI and air pollution control device operating parameters) and equipment calibration procedures (where applicable);
  - (vii) Inspection and maintenance of the HMIWI, air pollution control devices, and continuous emission monitoring systems;
  - (viii) Actions to correct malfunctions or conditions that may lead to malfunction;
  - (ix) Bottom and fly ash characteristics and handling procedures;
  - (x) Applicable federal, state, and local regulations;
  - (xi) Work safety procedures;
  - (xii) Pre-startup inspections; and
  - (xiii) Recordkeeping requirements.
- (2) An examination designed and administered by the instructor.
- (3) Reference material distributed to the attendees covering the course topics.
- (d) Qualification shall be obtained by:
- (1) Completion of a training course that satisfies the criteria under paragraph (c) of this section; and
  - (2) Either six months experience as an HMIWI operator, six months experience as a direct supervisor of an HMIWI operator, or completion of at least two burn cycles under the observation of two qualified HMIWI operators.
- (e) Qualification is valid from the date on which the examination is passed or the completion of the required experience, whichever is later.
- (f) To maintain qualification, the trained and qualified HMIWI operator shall complete and pass an annual review or refresher course of at least four hours covering, at a minimum, the following:
- (1) Update of regulations;
  - (2) Incinerator operation, including startup and shutdown procedures;

- (3) Inspection and maintenance;
  - (4) Responses to malfunctions or conditions that may lead to malfunction; and
  - (5) Discussion of operating problems encountered by attendees.
- (g) A lapsed qualification shall be renewed by one of the following methods:
- (1) For a lapse of less than three years, the HMIWI operator shall complete and pass a standard annual refresher course described in paragraph (f) of this section.
  - (2) For a lapse of three years or more, the HMIWI operator shall complete and pass a training course with the minimum criteria described in paragraph (c) of this section.
- (h) The owner or operator of an affected facility shall maintain documentation at the facility that addresses the following:
- (1) Summary of the applicable requirements under this standard;
  - (2) Description of basic combustion theory applicable to an HMIWI;
  - (3) Procedures for receiving, handling, and charging waste;
  - (4) HMIWI startup, shutdown, and malfunction procedures;
  - (5) Procedures for maintaining proper combustion air supply levels;
  - (6) Procedures for operating the HMIWI and associated air pollution control systems within the requirements established under this standard;
  - (7) Procedures for responding to periodic malfunction or conditions that may lead to malfunction;
  - (8) Procedures for monitoring HMIWI emissions;
  - (9) Reporting and recordkeeping procedures; and
  - (10) Procedures for handling ash.
- (i) The owner or operator of an affected facility shall establish a program for reviewing the information listed in paragraph (h) of this section annually with each HMIWI operator.
- (1) The initial review of the information listed in paragraph (h) of this section shall be conducted within six months after the effective date of this subpart or prior to assumption of responsibilities affecting HMIWI operation, whichever date is later.
  - (2) Subsequent reviews of the information listed in paragraph (h) of this section shall be conducted annually.

(j) The information listed in paragraph (h) of this section shall be kept in a readily accessible location for all HMIWI operators. This information, along with records of training shall be available for inspection by

the Department.

### **Section X - Waste Management Plan.**

The owner or operator of an affected facility shall prepare a waste management plan. The waste management plan shall identify both the feasibility and the approach to separate certain components of solid waste from the health care waste stream in order to reduce the amount of toxic emissions from incinerated waste. A waste management plan may include, but is not limited to, elements such as paper, cardboard, plastics, glass, battery, or metal recycling; or purchasing recycled or recyclable products. A waste management plan may include different goals or approaches for different areas or departments of the facility and need not include new waste management goals for every waste stream. It should identify, where possible, reasonably available additional waste management measures, taking into account the effectiveness of waste management measures already in place, the costs of additional measures, the emission reductions expected to be achieved, and any other environmental or energy impacts they might have. The American Hospital Association publication entitled "An Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities" (incorporated by reference, see 40 CFR 60.17, September 15, 1997), shall be considered in the development of the waste management plan.

### **Section XI - Inspection Guidelines.**

(a) The owner or operator of an affected facility shall ensure that the HMIWI has an initial equipment inspection performed within one year of the effective date of this standard. The inspection shall not relieve the owner or operator from any detected violations.

(1) At a minimum, an inspection shall include the following:

(i) Inspect all burners, pilot assemblies, and pilot sensing devices for proper operation; clean pilot flame sensor, as necessary;

(ii) Ensure proper adjustment of primary and secondary chamber combustion air, and adjust as necessary;

(iii) Inspect hinges and door latches and lubricate as necessary;

(iv) Inspect dampers, fans, and blowers for proper operation;

(v) Inspect HMIWI door and door gaskets for proper sealing;

(vi) Inspect motors for proper operation;

(vii) Inspect primary chamber refractory lining; clean and repair/replace lining as necessary;

(viii) Inspect incinerator shell for corrosion and/or hot spots;

(ix) Inspect secondary/tertiary chamber and stack, clean as necessary;

(x) Inspect mechanical loader, including limit switches, for proper operation, if applicable;

(xi) Visually inspect waste bed (grates), and repair/seal, as appropriate;

(xii) For the burn cycle that follows the inspection, document that the incinerator is operating properly

and make any necessary adjustments;

(xiii) Inspect air pollution control device(s) for proper operation, if applicable;

(xiv) Inspect waste heat boiler systems to ensure proper operation, if applicable;

(xv) Inspect bypass stack components;

(xvi) Ensure proper calibration of thermocouples, sorbent feed systems and any other monitoring equipment; and

(xvii) Generally observe that the equipment is maintained in good operating condition.

(2) Within 10-operating days following an equipment inspection, the owner or operator of an affected facility shall ensure that all necessary repairs shall be completed. In order to exceed the 10 days, the owner or operator must justify the extension and obtain written approval from the Department establishing a date whereby all necessary repairs of the designated facility shall be completed.

(b) The owner or operator of an affected facility shall ensure that the HMIWI has an equipment inspection performed annually (no more than 12 months following the previous annual equipment inspection), as outlined in paragraphs (a)(1) and (a)(2) of this section.

## Appendix A

### Toxic Equivalency Factors

Dioxins/Furans Congener	Toxic Equivalency
Factor 2,3,7,8-tetrachlorinated dibenzo-p-dioxin	1
1,2,3,7,8-pentachlorinated dibenzo-p-dioxin	0.5
1,2,3,4,7,8-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,7,8,9-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,6,7,8-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,4,6,7,8-heptachlorinated dibenzo-p-dioxin	0.01
Octachlorinated dibenzo-p-dioxin	0.001
2,3,7,8-tetrachlorinated dibenzofuran	0.1
2,3,4,7,8-pentachlorinated dibenzofuran	0.5
1,2,3,7,8-pentachlorinated dibenzofuran	0.05
1,2,3,4,7,8-hexachlorinated dibenzofuran	0.1

1,2,3,6,7,8-hexachlorinated dibenzofuran	0.1
1,2,3,7,8,9-hexachlorinated dibenzofuran	0.1
2,3,4,6,7,8-hexachlorinated dibenzofuran	0.1
1,2,3,4,6,7,8-heptachlorinated dibenzofuran	0.01
1,2,3,4,7,8,9-heptachlorinated dibenzofuran	0.01
Octachlorinated dibenzofuran	0.001

## Appendix B

### Residence Time Calculation Guidance

The review of all incinerators shall include verification of the residence time stated on the application. This guidance shall be followed to assure that these calculations are handled in a uniform manner.

**STEP 1.** Estimate the total heat input to the system:

Total system heat input (Btu/hr) = [Maximum waste firing rate (lbs/hr) x Maximum heating value (Btu/lb)] + Average primary burner heat input + Average secondary burner input.

NOTE: Use the average burner inputs required after the onset of waste burning.

Use a waste heating value of 8,500 Btu/lb.

**STEP 2.** Estimate the system heat loss (prior to heat recovery):

System heat loss = Shell loss + Sensible heat in ash + Sensible heat in unburned carbon + Latent heat.

The heat loss may be assumed to be 20 percent of total heat input.

**STEP 3.** Calculate the net heat available (Q) to raise the temperature of the products of combustion:

$Q \text{ (Btu/hr)} = (\text{Total system heat input}) - (\text{System heat loss}).$

**STEP 4.** Calculate the weight of product of combustion (M):

$M = Q / \{C_p \times (T_o - T_i)\}$

$C_p$  = Average specific heat (Btu/lb degrees F), assume a value of 0.28.

$T_o$  = Exit temperature (degrees F), use the design temperature of 2000 degrees F as  $T_o$ .

$T_i$  = Ambient air temperature (degrees F), assume the ambient temperature to be 70 degrees F.



**STEP 5.** Calculate the volume of product of combustion (F):

$$F \text{ (scfs)} = \frac{M}{d \times 60 \times 60}$$

d (lb/ft<sup>3</sup>) = Density of exhaust gases at 70 degrees F, use a value of 0.075.

$$F1 \text{ (acfs)} = F \times \frac{(T_o + 460)}{530}$$

$$F1 \text{ design temperature} = \frac{F \times 2460}{530}$$

scfs = standard cubic feet per second

acfs = actual cubic feet per second

**STEP 6.** Calculate the volume of secondary chamber.

**STEP 7.** Residence time =  $\frac{\text{chamber volume}}{F^1}$

For a minimum 1 second (sec) secondary chamber residence time and design temperature 2000 degrees F,

$$\frac{\text{Secondary chamber volume}}{F^1} \geq 1$$